

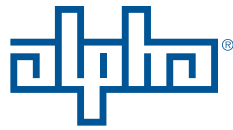


# GLOBAL POWER SOLUTIONS

TOTAL POWER SOLUTIONS BY ALPHA TECHNOLOGIES

*Power*

member of The  Group™



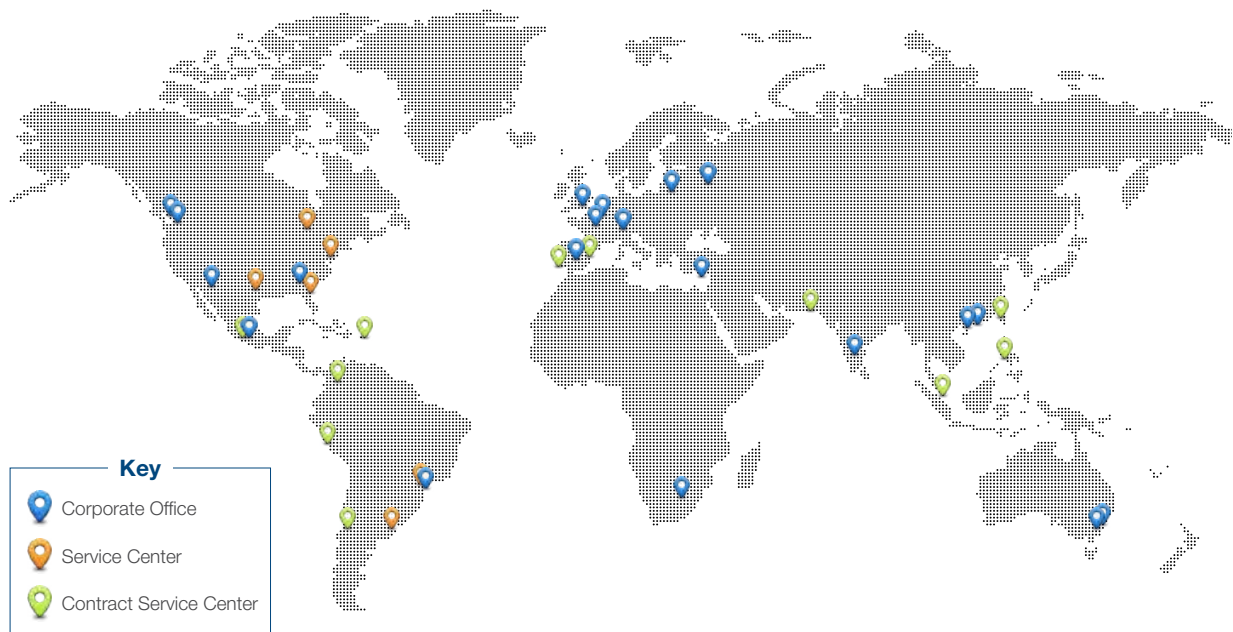
# Total **POWER** Solutions

## ➤ Alpha Power

Alpha pioneered the concept of reliable uninterruptible power for communications networks, and in the process has set a 35-year precedent for visionary, market-driven power solutions. Today, with millions of power systems installed around the world, we continue to focus on providing the most reliable, innovative and energy efficient powering solutions.

## ➤ Global Reach

With millions of powering systems installed and sales, manufacturing and service facilities located around the world, we are able to help you in a language you'll understand. This global reach gives us the expertise to provide your specific power solution.



## ➤ Our Goal: Reducing Your Total Cost of Ownership



We set high standards for ourselves in engineering the next-generation power technologies and are **committed to extreme reliability**, cost savings and best-in-class performance.



Instead of giving you data, **intelligent power products give you answers**. We are continually working to provide the answers that optimize power system performance.



Running a cleaner and more efficient powering network can **greatly reduce the amount of resources consumed**, and at the same time lead to big reductions in operational expenses.



Through proper load matching and power supply sizing, **tailored powering systems** can perform at up to 94 percent efficiency, including room for system growth.



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KM3

High Efficiency CableUPS

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# OUTSIDE PLANT

Alpha Technologies produces the most reliable, technologically advanced and cost-effective broadband cable powering solutions on the market. Alpha's full line of power products include:

- **XM3-HP** ..... 6-9
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- **XM2-300HP** ..... 11
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# XM3-HP

Advanced Efficiency Technology



Exclusive, Patent-Protected Transformer Design

**e<sup>3</sup>** The Alpha XM3-HP **triple efficiency** ferro technology optimizes the power supply's performance, resulting in significantly reduced utility power consumption and a direct savings in network operations.

## Highest Line Mode Efficiency

The XM3-HP offers the highest line mode efficiency available, requiring less AC utility power to support a load.

$$\text{Utility Power (kW)} = \left( \frac{P_{\text{Network Load}} + \sum \left[ \frac{(P_{\text{Active}})^2}{V_{\text{Active}}^2} \times \Omega_{\text{Feet of cable}} \times \text{Feet Distance} \right]}{\text{Power Supply Efficiency}} \right)$$

Cable Power Loss— $I^2R$

## Tightest Output Voltage Regulation

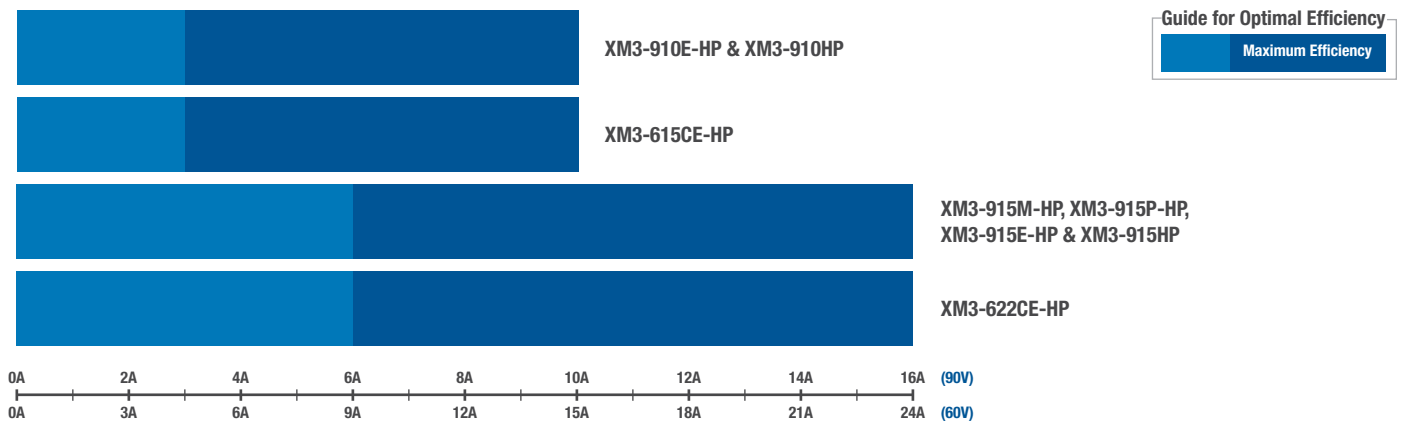
Alpha's XM3-HP provides the tightest output voltage regulation ever offered to reduce  $I^2R$  cable power losses.

## Maximum Inverter Efficiency

Significant gains in inverter efficiency directly translate into increased battery runtimes, further improving network performance and power outage recovery capabilities.

## Load Optimization

The XM3-HP is available in several models to best match network load requirements.



# XM3-HP

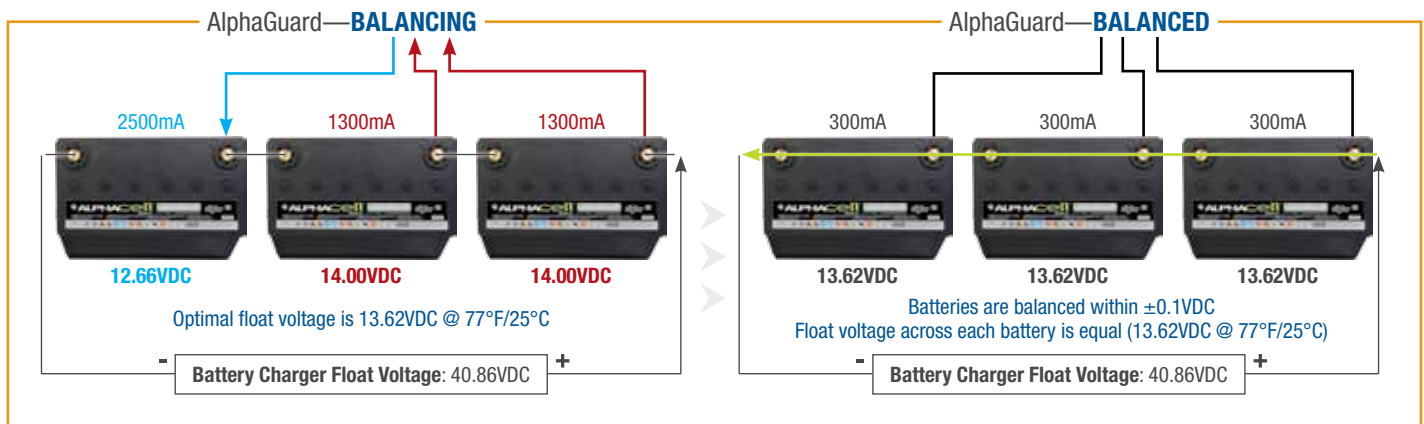
## Advanced Battery Management

The Alpha XM3-HP's advanced battery management optimizes battery life and contributes to **reducing both capital expenditures and on-going operating costs.**



### ► Embedded Battery Balancing

The Alpha XM3-HP embedded AlphaGuard™ uses advanced battery balancing technology to redirect current from overcharged batteries to the undercharged battery, optimizing battery service life.



### ► Extended Runtime

The Alpha XM3-HP's advanced battery management and increased inverter efficiency maximizes battery runtime in the network.

| AlphaCell HP (Estimated Runtime Minutes Using XM3-HP) |       |       |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|-------|-------|
| 90VAC @   | 4A    |       | 6A    |       | 8A    |       | 10A   |       |
| Models:   | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries:  | 540   | 588   | 358   | 394   | 263   | 295   | 204   | 234   |
| 6 Batteries:  | 1144  | 1264  | 771   | 841   | 574   | 324   | 450   | 491   |
| 90VAC @   | 12A   |       | 14A   |       | 16A   |       | 18A   |       |
| Models:   | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries:  | 165   | 193   | 137   | 164   | 116   | 142   | 100   | 123   |
| 6 Batteries:  | 368   | 404   | 308   | 342   | 264   | 295   | 227   | 257   |

| AlphaCell GXL (Estimated Runtime Minutes Using XM3-HP) |        |        |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|--------|--------|
| 90VAC @  | 4A     |        | 6A     |        | 8A     |        | 10A    |        |
| Models:  | 195GXL | 220GXL | 195GXL | 220GXL | 195GXL | 220GXL | 195GXL | 220GXL |
| 3 Batteries:   | 476    | 550    | 313    | 363    | 229    | 265    | 177    | 205    |
| 6 Batteries:   | 1026   | 1177   | 685    | 789    | 506    | 585    | 396    | 458    |
| 90VAC @  | 12A    |        | 14A    |        | 16A    |        | 18A    |        |
| Models:  | 195GXL | 220GXL | 195GXL | 220GXL | 195GXL | 220GXL | 195GXL | 220GXL |
| 3 Batteries:   | 142    | 164    | 118    | 136    | 99     | 115    |        |        |
| 6 Batteries:   | 322    | 373    | 269    | 311    | 229    | 266    |        |        |

### ► Dynamic Multi-Stage Charging

The Alpha XM3-HP's dynamic 5-stage battery charging technology provides system batteries with optimal charge management.

**BULK | ACCEPT | FLOAT | REFRESH | REST**



# XM3-HP

Advanced Intelligence Platform



The Alpha XM3-HP's internal intelligence provides Network Operation Centers (NOC) with the critical and highly relevant data necessary to **reduce operating expenses** through remote management.

## ► Embedded DOCSIS® Communications

The Alpha XM3-HP's AlphaNet™ Integrated DOCSIS® communications platform enables access to all of the XM3-HP's advanced information and diagnostics through a standard (SNMP) network interface.

### DOCSIS Communications Menu

COMM - GENERAL  
CM MAC ADDRESS  
00:90:EA:00:36:EA  
↑ ↓ ESC

COMM - GENERAL  
CM IP ADDRESS  
192.168.1.120  
↑ ↓ ESC

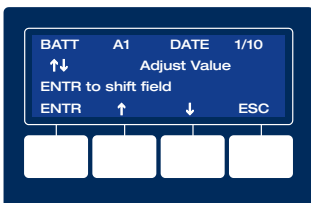
COMM - GENERAL  
CM RECEIVE POWER  
9.8dBmV  
↑ ↓ ESC

COMM - GENERAL  
CM TRANSMIT POWER  
39.0dBmV  
↑ ↓ ESC

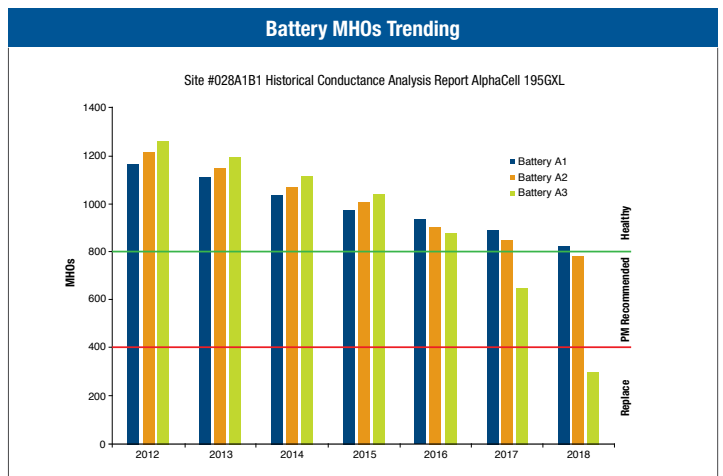
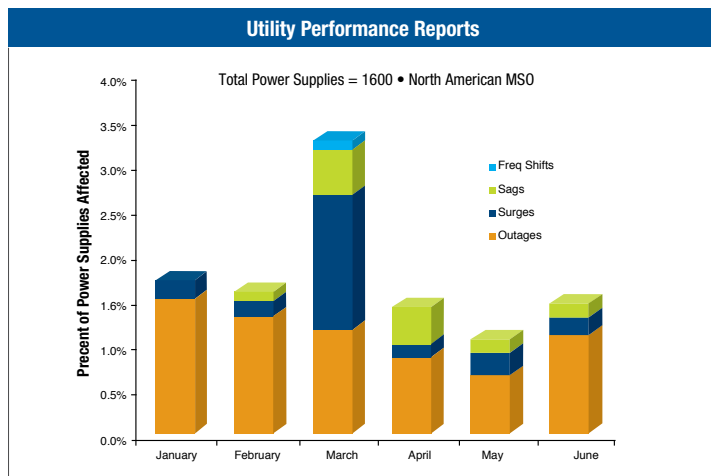
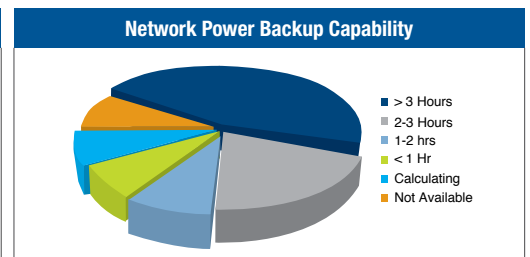
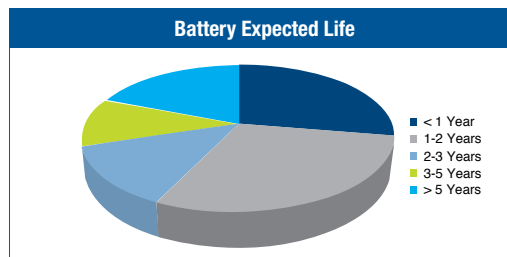
MAC Address
IP Address
Receive and Transmit Power Levels

## ► Embedded AlphaApps

Power reliability algorithms use real-time data to predict service intervals and battery replacements.



Enter Battery Date Code & MHOs Reading





# XM3-HP

CableUPS® Power Supply



- Improved efficiency levels
- Optimized network performance
- Reduced operating costs and total cost of ownership

| Models                                       | 915M-HP   | 915P-HP   | 910E-HP   | 915E-HP   | 615CE-HP  | 622CE-HP  | 908HP     | 910HP     | 915HP     | 918HP     |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Fine Mode Parameters</b>                  |           |           |           |           |           |           |           |           |           |           |
| Nominal AC Input Voltage (VAC):              | 127       | 200-240   | 200-240   | 200-240   | 230       | 230       | 120       | 120       | 120       | 120       |
| Nominal Input Frequency:                     | 60Hz      | 60Hz      | 50Hz      | 50Hz      | 50Hz      | 50Hz      | 60Hz      | 60Hz      | 60Hz      | 60Hz      |
| Input Frequency Tolerance (%):               | ±3        | ±3        | ±3        | ±3        | ±3        | ±3        | ±3        | ±3        | ±3        | ±3        |
| Input Voltage Operating Range Tolerance (%): | -34 / +15 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +15 | -30 / +15 | -30 / +15 | -30 / +15 |
| Output Voltage (VAC):                        | 63 / 89   | 63 / 89   | 63 / 89   | 63 / 89   | 63        | 63        | 63 / 89   | 63 / 89   | 63 / 89   | 63 / 89   |
| Output Voltage Regulation:                   | -5 / +1   | -5 / +1   | -5 / +1   | -5 / +1   | -6 / +1.5 | -6 / +1.5 | -5 / +1   | -5 / +1   | -5 / +1   | -5 / +1   |
| Maximum Rated Output Current:                | 15A       | 15A       | 15 / 10A  | 22 / 15A  | 15A       | 22A       | 8A        | 10A       | 15A       | 18A       |
| Output Power (VA):                           | 1350      | 1350      | 900       | 1350      | 900       | 1408      | 720       | 900       | 1350      | 1620      |
| Line Mode Efficiency:                        | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% | Up to 94% |
| Standby Efficiency:                          | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% | Up to 91% |
| Bulk Charger Current <sup>1</sup> :          | 10A       | 10A       | 10A       | 10A       | 10A       | 10A       | 10A       | 10A       | 10A       | 10A       |
| Battery Voltage (VDC):                       | 36        | 36        | 36        | 36        | 36        | 36        | 36        | 36        | 36        | 36        |

| <b>Mechanical</b>             |  |           |           |           |           |           |           |           |           |             |
|-------------------------------|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| Inverter Module:              | Front plug in, Hot-swappable inverter module   |           |           |           |           |           |           |           |           |             |
| Dimensions H x W x D (in/mm): | 7.8 x 15 (16.7 w/handle) x 10 (10.7 w/handle) / 198.1 x 381 (424.18 w/handle) x 254 (271.8 w/handle) |           |           |           |           |           |           |           |           |             |
| Weight (lb/kg):               | 60 / 27.2  | 60 / 27.2 | 53 / 24.1 | 67 / 30.5 | 53 / 24.1 | 67 / 30.5 | 48.5 / 22 | 49 / 22.3 | 60 / 27.2 | 60.5 / 27.5 |
| Input Power Connector:        | IEC 320/C20  |           |           |           |           |           |           |           |           |             |
| Battery Connector:            | Anderson style 75A   |           |           |           |           |           |           |           |           |             |
| Remote Temp Sensor:           | Ring lug fastens to negative terminal on center battery  |           |           |           |           |           |           |           |           |             |
| Display:                      | 4 Line by 20 character blue LCD with soft-key menu controls  |           |           |           |           |           |           |           |           |             |
| LRI Connector:                | Anderson PP30's  |           |           |           |           |           |           |           |           |             |
| Mounting:                     | Shelf mounts inside suitably rated electrical enclosure  |           |           |           |           |           |           |           |           |             |

| <b>Environment</b>     |  |  |  |  |  |  |  |  |  |  |
|------------------------|--|--|--|--|--|--|--|--|--|--|
| Operating Temperature: | -40 to 60°C / -40 to 140°F (derate by 2°C / 3.6°F per 1000 feet above 3000 feet) |  |  |  |  |  |  |  |  |  |
| Storage Temperature:   | -40 to 70°C / -40 to 158°F   |  |  |  |  |  |  |  |  |  |
| Humidity:              | 0 to 95% non-condensing (relative)   |  |  |  |  |  |  |  |  |  |
| Conformal Coating:     | All printed circuit board assemblies to prevent moisture related failure         |  |  |  |  |  |  |  |  |  |

| <b>Details</b>                     |           |           |           |           |           |           |           |           |           |           |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Name Plate Rating (VAC):           | 127       | 200-240   | 200-240   | 200-240   | 230       | 230       | 110-127   | 110-127   | 110-127   | 110-127   |
| Input Window (% of Nominal Input): | -34 / +15 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +20 | -30 / +15 | -30 / +15 | -30 / +15 | -30 / +15 |
| Input Range (VAC):                 | 84-146    | 161-276   | 161-276   | 161-276   | 161-276   | 161-276   | 161-276   | 84-138    | 84-138    | 84-138    |
| Output Regulation (%):             | -5 / +1   | -5 / +1   | -5 / +1   | -5 / +1   | -6 / +1.5 | -6 / +1.5 | -5 / +1   | -5 / +1   | -5 / +1   | -5 / +1   |
| Load Range:                        | 1-15A     | 1-15A     | 1-10A     | 1-15A     | 1-15A     | 1-22A     | 1-8A      | 1-10A     | 1-15A     | 1-18A     |
| Output Voltage Min/Max (VAC):      | 84.6 / 90 | 84.6 / 90 | 84.6 / 90 | 84.6 / 90 | 59.2 / 64 | 59.2 / 64 | 84.6 / 90 | 84.6 / 90 | 84.6 / 90 | 84.6 / 90 |

| <b>Safety Compliance</b>                     |        |        |   |   |    |    |        |        |        |        |
|--|--------|--------|---|---|----|----|--------|--------|--------|--------|
| UL/CSA 60950-1, UL 1778, CSA 107.3 (NRTL/C): | Y      | Y      |   |   |    |    | Y      | Y      | Y      | Y      |
| IEC 60950-1 (CB):                            | Y      | Y      | Y | Y | Y  | Y  | Y      | Y      | Y      | Y      |
| IEC 62040-1:                                 |        |        |   |   | Y  | Y  |        |        |        |        |
| Safety Mark:                                 | NRTL/C | NRTL/C |   |   | CE | CE | NRTL/C | NRTL/C | NRTL/C | NRTL/C |

| <b>EMC Compliance</b>  |   |   |   |   |   |   |   |   |   |   |
|------------------------|---|---|---|---|---|---|---|---|---|---|
| FCC Part 15 Class A:   | Y | Y |   |   |   |   | Y | Y | Y | Y |
| IEC/EN 50083-2 (CATV): |   |   |   |   | Y | Y |   |   |   |   |
| IEC/EN 65040-2 (UPS):  |   |   | Y | Y | Y | Y |   |   |   |   |
| CISPR22:               |   |   | Y | Y | Y | Y |   |   |   |   |

<sup>1</sup> XM2-622CE will continue as a 48V model until further notice.  
<sup>2</sup> Bulk charger current @ 80% load & nom line.

# XM3V-HP

CableUPS® Power Supply



- Improved efficiency levels
- Optimized network performance
- Reduced operating costs and total cost of ownership
- Wall-mountable configuration

| Models   | 608CE-HP   | 608CE-HP-24 | 618CE-HP    | 618CE-HP-24 | 912E-HP     | 912E-HP-24  | 906E-HP     | 906E-HP-24  |
|--|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Parameters</b>                                  |  |             |             |             |             |             |             |             |
| Nominal AC Input Voltage (VAC):                    | 230  | 230         | 230         | 230         | 200–240     | 200–240     | 200–240     | 200–240     |
| Nominal Input Frequency (Hz):                      | 50   | 50          | 50          | 50          | 50          | 50          | 50          | 50          |
| Input Frequency Tolerance (%):                     | ±3   | ±3          | ±3          | ±3          | ±3          | ±3          | ±3          | ±3          |
| Input Voltage Operating Range Tolerance (%):       | -30 / +20  | -30 / +20   | -30 / +20   | -30 / +20   | -30 / +20   | -30 / +20   | -30 / +20   | -30 / +20   |
| Output Voltage (VAC):                              | 63   | 63          | 63          | 63          | 89          | 89          | 89          | 89          |
| Output Voltage Regulation:                         | -3.5 / +1.5  | -3.5 / +1.5 | -3.5 / +1.5 | -3.5 / +1.5 | -5 / +1     | -5 / +1     | -5 / +1     | -5 / +1     |
| Maximum Rated Output Current (A):                  | 8  | 8           | 18          | 18          | 12          | 12          | 6           | 6           |
| Maximum Output Power (VA):                         | 504  | 504         | 1134        | 1134        | 1068        | 1068        | 534         | 534         |
| Line Mode Efficiency (%):                          | Up to 94   | Up to 94    | Up to 94    | Up to 94    | Up to 94    | Up to 94    | Up to 94    | Up to 94    |
| Standby Efficiency (%):                            | Up to 91   | Up to 91    | Up to 91    | Up to 91    | Up to 91    | Up to 91    | Up to 91    | Up to 91    |
| Bulk Charger Current (Amps @ 80% Load & Nom line): | 6  | 6           | 10          | 10          | 10          | 10          | 6           | 6           |
| Battery Voltage (VDC):                             | 36   | 24          | 36          | 24          | 36          | 24          | 36          | 24          |
| <b>Mechanical</b>                                  |  |             |             |             |             |             |             |             |
| Inverter Module:                                   | Front plug in, hot-swappable inverter module                             |             |             |             |             |             |             |             |
| Dimensions H x W x D (mm):                         | 198.1 x 381 (424.18 w/handle) x 254 (271.8 w/handle)                     |             |             |             |             |             |             |             |
| Weight (kg):                                       | 23.8   | 23.8        | 28.8        | 28.8        | 28.8        | 28.8        | 23.8        | 23.8        |
| Input Power Connector:                             | IEC 320/C20  | IEC 320/C20 | IEC 320/C20 | IEC 320/C20 | IEC 320/C20 | IEC 320/C20 | IEC 320/C20 | IEC 320/C20 |
| Battery Connector:                                 | Anderson style 75A   |             |             |             |             |             |             |             |
| Remote Temp Sensor:                                | Ring lug fastens to negative terminal on center battery                  |             |             |             |             |             |             |             |
| Display:   | 4 Line by 20 character LCD with soft-key menu controls                   |             |             |             |             |             |             |             |
| LRI Connector:                                     | Pluggable Terminal Block   |             |             |             |             |             |             |             |
| Mounting:  | Shelf mounts inside suitably rated electrical enclosure                  |             |             |             |             |             |             |             |
| <b>Environment</b>                                 |  |             |             |             |             |             |             |             |
| Operating Temperature (°C):                        | -40–60 (derate by 2°C per 304.8 m above 914.4 m)                         |             |             |             |             |             |             |             |
| Storage Temperature (°C):                          | -40 to 70  | -40 to 70   | -40 to 70   | -40 to 70   | -40 to 70   | -40 to 70   | -40 to 70   | -40 to 70   |
| Humidity (%):                                      | 0–95 non-condensing (relative)   |             |             |             |             |             |             |             |
| Conformal Coating:                                 | All printed circuit board assemblies to prevent moisture related failure |             |             |             |             |             |             |             |
| <b>Safety Compliance</b>                           |  |             |             |             |             |             |             |             |
| EN 60728-11:                                       | Yes  | Yes         | Yes         | Yes         | N/A         | N/A         | N/A         | N/A         |
| IEC 60950-1 (CB):                                  | Yes  | Yes         | Yes         | Yes         | Yes         | Yes         | Yes         | Yes         |
| IEC 62040-1:                                       | Yes  | Yes         | Yes         | Yes         | N/A         | N/A         | N/A         | N/A         |
| Safety Mark:                                       | CE   | CE          | CE          | CE          | N/A         | N/A         | N/A         | N/A         |
| <b>EMC Compliance</b>                              |  |             |             |             |             |             |             |             |
| IEC/EN 50083-2 (CATV):                             | Yes  | Yes         | Yes         | Yes         | N/A         | N/A         | N/A         | N/A         |
| IEC/EN 65040-2 (UPS):                              | Yes  | Yes         | Yes         | Yes         | N/A         | N/A         | N/A         | N/A         |
| CISPR22:   | N/A  | N/A         | N/A         | N/A         | Yes         | Yes         | Yes         | Yes         |

# XM2-300HP

High Efficiency CableUPS®



- High efficiency 300W power supply
- XM2 programmable LCD smart display
- New predictive preventive maintenance features
- Small footprint and lightweight
- Ideal for RFoG, MDU and N+0 applications
- Embedded DOCSIS® status monitoring

| Models                                 | XM2-300HP   | XM2-300CE-HP   |
|--|---|--|
| <b>Electrical</b>                      |   |  |
| Input Voltage (VAC):                   | 120   | 230  |
| Input Voltage Window:                  | -15 to +10%   | -15 to +10%  |
| Input Frequency:                       | 60Hz  | 50Hz   |
| Input Frequency Window:                | ±3Hz  | ±3Hz   |
| Output Voltage (VAC):                  | 60/87   | 63   |
| Output Current (A):                    | 5/3.5   | 4.8  |
| Max Output Power (VA):                 | 300   | 300  |
| Output Waveform:                       | Sinewave  | Sinewave   |
| Voltage Regulation:                    | ±5%   | ±5%  |
| Output Frequency Stability:            | <b>Line Mode:</b> 60Hz nominal, <b>Inverter Mode:</b> 60Hz, ±0.05%  | <b>Line Mode:</b> 50Hz nominal, <b>Inverter Mode:</b> 50Hz, ±0.05% |
| Short Circuit Protection:              | 150% for 10 seconds   | 150% for 10 seconds  |
| Transfer Characteristics:              | ≤4ms  | ≤4ms   |
| Battery Voltage (VDC):                 | 12  | 12   |
| <b>Efficiency (Typical Load Range)</b> |   |  |
| Line Mode:                             | 93-94%  | 92-93%   |
| Standby Mode:                          | 82-86%  | 85-88%   |
| <b>Battery Charger</b>                 |   |  |
| Temperature Compensation:              | Programmable (0 to 5mV/Cell/°C)   | Programmable (0 to 5mV/Cell/°C)                                    |
| Charger Current:                       | 6A minimum - 10A maximum  | 6A minimum - 10A maximum   |
| Three Stage:                           | Bulk / Accept / Float   | Bulk / Accept / Float  |
| <b>Mechanical</b>                      |   |  |
| Status Display:                        | Blue smart display 2 x 20 LCD with backlight  | Blue smart display 2 x 20 LCD with backlight                       |
| Dimensions H x W x D (in/mm):          | 8.5 x 9.75 x 8 / 216 x 248 x 203  | 8.5 x 9.75 x 8 / 216 x 248 x 203                                   |
| Approximate Weight (lb/kg):            | 23 / 10.4   | 25 / 11.3  |
| Finish:                                | Black, epoxy powdercoat   | Black, epoxy powdercoat  |
| <b>Environment</b>                     |   |  |
| Operating Temperature:                 | -40 to 55°C / -40 to 131°F  | -40 to 55°C / -40 to 131°F   |
| Humidity:                              | 0 to 95% non-condensing   | 0 to 95% non-condensing  |
| Agency Compliance:                     | FCC Part 15 Class A, UL / CSA 60950-1, UL1778, UL1012 CSA C22.2 No. 107   | CE EN 50083-2, EN 62040-2, EN 60950-1, EN 62040-1                  |
| <b>Advanced Diagnostics</b>            |   |  |
| Advanced Analytics:                    | Onboard battery algorithm for predictive service required, onboard inverter algorithm for predictive service required.  |  |
| User Inputs:                           | Power supply install and battery manufacturing dates, Power supply priority level, Siemens values during battery preventive maintenance cycles, Battery out-of-date period, Battery heater mat installed (Yes/No), Technician code/ID |  |

# VMX Series

Versatile Mount Standby Power Supply



- Fifth generation CableUPS®
- Versatile mounting options, vertical enclosure, wall or shelf mount
- Line Interactive Ferro Technology (LIFT)
- Wide input tolerance
- Multi-language capability
- Four programmable outputs standard

| Models   | VMX 615CE  | VMX 622CE-48  | VMX 915E  |
|--|--|---|---|
| <b>Electrical</b>                                  |  |   |   |
| Input Voltage:                                     | 230Vrms  | 230Vrms   | 230Vrms   |
| Input Voltage Tolerance:                           | Operating: ±158 to 292Vrms, Line Return: ±169 to 281Vrms   |   |   |
| Nominal Input Current <sup>1</sup> :               | 5A   | 7A  | 7A  |
| Input Frequency:                                   | 50Hz, ±3Hz   | 50Hz, ±3Hz  | 50Hz, ±3Hz  |
| DC Voltage:  | 36VDC  | 48VDC   | 36VDC   |
| Low DC Voltage Cutout:                             | 1.75V/Cell   | 1.75V/Cell  | 1.75V/Cell  |
| Output Voltage:                                    | 63Vrms   | 48/63Vrms (Field Selectable)                            | 63/87Vrms (Field Selectable)                            |
| Output Regulation:                                 | High TAP <sup>2</sup> : ±3%, Low TAP <sup>2</sup> : ±4%  | High TAP <sup>2</sup> : ±3%, Low TAP <sup>2</sup> : ±4% | High TAP <sup>2</sup> : ±3%, Low TAP <sup>2</sup> : ±4% |
| Output Current:                                    | 15Arms   | 22Arms  | 15Arms  |
| Output Configuration:                              | 4 Programmable Outputs   | 4 Programmable Outputs                                  | 4 Programmable Outputs                                  |
| Output Frequency Stability:                        | 50Hz, ±1Hz (Inverter Operation)  | 50Hz, ±1Hz (Inverter Operation)                         | 50Hz, ±1Hz (Inverter Operation)                         |
| Waveform:  | Quasi-square wave  | Quasi-square wave                                       | Quasi-square wave                                       |
| Aux Output 150W rated UPS:                         | 205 to 260V (line), 170 to 265V (Inv)  | 205 to 260V (line), 170 to 265V (Inv)                   | 205 to 260V (line), 170 to 265V (Inv)                   |
| <b>Efficiency (@ Default TAP Settings)</b>         |  |   |   |
| Load (Typical Nominal Input):                      | @ 100% Load: 91%, @ 75% Load: 90%, @ 50% Load: 85%, @ 25% Load: 80%  |   |   |
| On Inverter (40 to 100% Load):                     | 80% typical  | 80% typical   | 80% typical   |
| <b>Fold back (Typical @ Nominal Input)</b>         |  |   |   |
| 87V, 63V, 48V TAP:                                 | N/A, 33Arms, N/A   | N/A, 35Arms, 45Arms                                     | 24Arms, 33Arms, N/A                                     |
| <b>Output Current Into Short (@ Nominal Input)</b> |  |   |   |
| 87V, 63V, 48V TAP:                                 | N/A, 29Arms typical, N/A   | N/A, <30Arms, <33Arms                                   | <22.5Arms, 29Arms typical, N/A                          |
| <b>Overload Current Operation</b>                  |  |   |   |
| Loads:   | 0 to 110%: Continuous operation, 110 to 115%: Continuous operation with alarm, 115 to 125%: Shut down approx. 30min, 125 to 150%: Shut down approx. 10min, >150%: Shut down <10sec |   |   |
| <b>Battery Charging</b>                            |  |   |   |
| Charge Current <sup>3</sup> :                      | 10A  |   |   |
| Temperature Compensation:                          | -5mV/Cell/°C (Programmable)  |   |   |
| Constant Operation:                                | Current: High rate charge to 90% Capacity, Voltage: 2.40V/Cell (Programmable)  |   |   |
| <b>Environmental</b>                               |  |   |   |
| Operating Temperature:                             | -40 to 55°C / -40 to 131°F at front air inlet of power supply  |   |   |
| Humidity and Elevation:                            | 0 to 95% non-condensing, 0 to 3000m / 0 to 10000ft   |   |   |
| <b>Mechanical</b>                                  |  |   |   |
| Vertical Mount (in/mm):                            | 11.7 x 20 x 9 / 297 x 508 x 229  |   |   |
| Shelf Mount (in/mm):                               | 8.4 x 16.5 x 12.5 / 212 x 420 x 317  |   |   |
| Weight (lb/kg):                                    | 67 / 30.5  | 67 / 30.5   | 67 / 30.5   |
| Front Panel:                                       | Display (LCD): 2 x 20 Character LCD, Indicators (LED): Output status and alarm   |   |   |
| Finish:  | Dark blue, epoxy powdercoat  |   |   |
| <b>Communication</b>                               |  |   |   |
| Status Monitoring <sup>4</sup> :                   | Optional DSM or ESM  |   |   |
| <b>Agency</b>                                      |  |   |   |
| Safety Recognition:                                | EN 50091-1-2, IEC 60950, CB Scheme CE  | EN 50091-1-2, IEC 60950, CB Scheme                      |   |
| Emissions:   | EN 50091-2, CE Class A   |   |   |

# GMX Series

CableUPS® Power Supply



- Line Interactive Ferro Technology (LIFT)
- Wide input voltage range of  $\pm 30\%$
- Compact packaging with light weight ferro
- Embedded DOCSIS® status monitoring
- Built-in battery circuit breaker
- IEC style line cord

| Models                                      | GMX 915                                     | GMX 915P   | GMX 615CE / GMX 915E                                    |
|---|---|--|---|
| <b>Electrical</b>                           |   |  |   |
| Input Voltage (VAC):                        | 120V  | 240V   | 240V  |
| Input Voltage Tolerance:                    | $\pm 30\%$ @ 115V (80 to 150Vrms)           | $\pm 30\%$ @ 225V (158 to 292Vrms)                       | $\pm 30\%$ @ 225V (158 to 292Vrms)                      |
| Line Return:                                | $\pm 25\%$                                  | $\pm 25\%$   | $\pm 25\%$  |
| Nominal Input Current <sup>1</sup> :        | 13A   | 7A   | 7A  |
| Input Frequency (without going to standby): | 60Hz, $\pm 3\text{Hz}$                      | 60Hz, $\pm 3\text{Hz}$                                   | 50Hz, $\pm 3\text{Hz}$                                  |
| DC Voltage:                                 | 36VDC                                       | 36VDC  | 36VDC   |
| Low DC Voltage Cutout:                      | 1.75V/Cell                                  | 1.75V/Cell   | 1.75V/Cell  |
| Output Voltage (VAC):                       | 63/87V (Field selectable)                   | 63/87V (Field selectable)                                | 63/87V (Field selectable)                               |
| Output Regulation, 87V Tap <sup>2</sup> :   | $\pm 3\%$                                   | $\pm 3\%$  | $\pm 3\%$   |
| Output Regulation, 63V Tap <sup>2</sup> :   | $\pm 4\%$                                   | $\pm 4\%$  | $\pm 4\%$   |
| Output Current:                             | 15A   | 15A  | 15A   |
| Output Configuration:                       | Single                                      | Single   | Single  |
| Output Frequency Stability:                 | 60Hz, $\pm 1\text{Hz}$ (Inverter operation) | 60Hz, $\pm 1\text{Hz}$ (Inverter operation)              | 50Hz, $\pm 1\text{Hz}$ (Inverter operation)             |
| Waveform:                                   | Quasi-square wave                           | Quasi-square wave  | Quasi-square wave                                       |
| <b>Battery Charging</b>                     |   |  |   |
| Charge Current <sup>3</sup> :               |   | 10A  |   |
| Temperature Compensation:                   |   | -5mV/Cell/°C (Programmable)                              |   |
| Constant Current Operation:                 |   | High Rate Charge to 90% Capacity                         |   |
| Constant Voltage Operation:                 |   | 2.4V/Cell (Typ. 7hrs) @ 25°C / 77°F                      |   |
| <b>Environmental</b>                        |   |  |   |
| Operating Temperature:                      |   | -40 to 55°C / -40 to 131°F                               |   |
| Humidity:                                   |   | 0 to 95% non-condensing                                  |   |
| Elevation:                                  |   | 0 to 3000m / 0 to 10000ft                                |   |
| <b>Mechanical</b>                           |   |  |   |
| Dimensions H x W x D (in/mm):               |   | 7.8 x 18.3 x 11.4 / 198 x 465 x 290                      |   |
| Weight (lb/kg):                             | 60 / 27.5                                   | 60 / 27.5  | 60 / 27.5   |
| Front Panel Display (LCD):                  |   | 2 x 20 Character LCD                                     |   |
| Front Panel Indicators (LED):               |   | Output status and alarm                                  |   |
| Finish:                                     |   | Black, epoxy powdercoat                                  |   |
| <b>Communication</b>                        |   |  |   |
| Status Monitoring <sup>4</sup> :            | Optional DSM or ESM                         | Optional DSM or ESM                                      | Optional DSM or ESM                                     |
| Safety Recognition:                         | UL 1778/CSA C22.2, No. 107.1                | UL 1778/CSA C22.2, No. 107.1,<br>IEC 60950 CCC CB scheme | EN50091-1-2, EN60950-1,<br>IEC 60950-1 CB scheme and CE |
| Emissions:                                  | CISPR 22, Class A                           | CISPR 22, Class A  | EN 50091-2, (CE Class A)                                |

<sup>1</sup> Batteries fully charged. <sup>2</sup> Output regulation at nominal input frequency, frequency variations will proportionally affect the output voltage.  
<sup>3</sup> Varies with input line voltage and output load. <sup>4</sup> Status monitoring optional.

# APX

## Non-Standby Power Supply

- Complete line conditioning
- Modular transformer design
- Flexible mounting options
- Current limited output and short circuit protection



| Models:          | Input Voltage (VAC) | Input Frequency (Hz) | Output Voltage (VAC) | Output Current (A) | Max. Output Power (VA) | Input Protection (Breaker) | Output Protection (Fuse) | Weight (lb/kg) |
|------------------|---------------------|----------------------|----------------------|--------------------|------------------------|----------------------------|--------------------------|----------------|
| APX 6008:        | 120                 | 60                   | 63                   | 8                  | 480                    | 8A                         | 10A                      | 21 / 9.5       |
| APX 6014:        | 120                 | 60                   | 63                   | 14                 | 840                    | 12A                        | 15A                      | 30 / 13.6      |
| APX 9015-120:    | 120                 | 60                   | 63 / 75 / 87         | 15                 | 1350                   | 12A                        | 20A                      | 47.5 / 21.6    |
| APX 9015-240:    | 240                 | 60                   | 63 / 75 / 87         | 15                 | 1350                   | 12A                        | 20A                      | 47.5 / 21.6    |
| APX 9015-120 HV: | 120                 | 60                   | 63 / 75 / 89         | 15                 | 1350                   | 12A                        | 20A                      | 51 / 23        |
| APX 9015-240 HV: | 240                 | 60                   | 63 / 75 / 89         | 15                 | 1350                   | 12A                        | 20A                      | 51 / 23        |
| APX 6008 RM:     | 120                 | 60                   | 63                   | 8                  | 480                    | 8A                         | 10A                      | 22 / 10        |
| APX 6014 RM:     | 120                 | 60                   | 63                   | 14                 | 840                    | 12A                        | 15A                      | 31 / 14        |
| APX 6008 E:      | 230                 | 50                   | 63                   | 8                  | 480                    | 8A                         | 10A                      | 24 / 10.9      |
| APX 6014 E:      | 230                 | 50                   | 63                   | 14                 | 840                    | 12A                        | 15A                      | 34 / 15.4      |
| APX 6008 P:      | 220                 | 60                   | 63                   | 8                  | 480                    | 8A                         | 10A                      | 22 / 9.9       |
| APX 6014 P:      | 220                 | 60                   | 63                   | 14                 | 840                    | 12A                        | 15A                      | 31 / 14        |

| Input                  |                    |
|------------------------|--------------------|
| Power Factor:          | >0.90 at full load |
| Voltage Tolerance:     | ±15%               |
| Voltage (APX 9015 HV): | -25 to 15%         |
| Frequency:             | ±3%                |

| Output      |                   |
|-------------|-------------------|
| Waveform:   | Quasi-square wave |
| Regulation: | ±5%               |
| Efficiency: | 90% or better     |

| Mechanical                    |   |
|-------------------------------|---|
| Dimensions H x W x D (in/mm): | APX 6008, 6014: 11.75 x 7.5 x 10.5 / 298 x 190 x 267<br>APX 9015: 15.5 x 8.5 x 11 / 394 x 216 x 279 |
| Finish:                       | Gray, epoxy powdercoat  |
| Enclosure Material:           | Aluminum  |

| Environment            |                                |
|------------------------|--------------------------------|
| Operating Temperature: | -40 to 55°C / -40 to 131°F     |
| Agency Compliance:     | UL1012/CSA C22.2 No. 107.1-M95 |

| Optional Features |   |
|-------------------|---|
| SIL-C:            | Long life LED pilot light               |
| LA-M:             | Plug-In lightning arrestor (120V)       |
| AMM-C:            | Easy reading panel ammeter              |
| TDR-M:            | Time delay relay (10 to 60sec variable) |
| ACAT-3P:          | Plug-In Amp Clamp™                      |
| GLK:              | Enclosure security lock (PM)            |

### Mounting Options

**Pole Mount (PM):** Built of durable, weather-resistant, powdercoated aluminum to withstand the harshest environments. This enclosure also includes brackets that provide for easy bolted, or banded pole mounting.

**Wall Mount (WM):** Allows the module to be mounted on a flat, vertical surface.

**Shelf Mount (SM):** Allows the module to be mounted on flat, horizontal surfaces such as the PWE or UPE enclosures. An extended input power cable is also included.

**Pedestal Mount (PED):** Ideal for ground mount applications, and provides weather-resistant, steel construction. The APX PED is available in either concrete or soil mount versions (please specify at time of order).

**Rack Mount (RM):** Ideal for mounting the power supply in a standard 19" rack.

# APX2 G Series

Non-Standby Power Supply



- Indoor and outdoor applications
- Complete line conditioning provides regulated, clean, reliable power
- Universal bracket allows for pole or wall mounting
- Current limited output and short circuit protection
- Available with indoor mesh cover

| Model:          | Input Voltage (VAC) | Input Frequency (Hz) | Output Voltage (VAC) | Output Current (A) | Max. Output Power (VA) | Input Fuse Protection (Breaker) | Weight (lb/kg) |
|-----------------|---------------------|----------------------|----------------------|--------------------|------------------------|---------------------------------|----------------|
| APX2 615 G:     | 220                 | 50                   | 63/48                | 15                 | 900                    | 8A                              | 35 / 15.88     |
| APX2 608 G:     | 220                 | 50                   | 63/48                | 8                  | 480                    | 5A                              | 28 / 12.7      |
| APX2 614 G-110: | 110                 | 60                   | 63                   | 14                 | 900                    | 15A                             | 35 / 15.88     |
| APX2 614 G-120: | 120                 | 60                   | 63                   | 14                 | 900                    | 15A                             | 35 / 15.88     |
| APX2 614 G-220: | 220                 | 60                   | 63                   | 14                 | 900                    | 8A                              | 35 / 15.88     |
| APX2 905 G:     | 220                 | 50                   | 87/63                | 5                  | 450                    | 5A                              | 28 / 12.7      |
| APX2 910 G:     | 220                 | 50                   | 87/63                | 10                 | 900                    | 8A                              | 35 / 15.88     |

| Input                       |  |
|-----------------------------|--|
| Power Factor:               | >0.90 at full load   |
| Voltage (50Hz/60Hz):        | 220VAC -20 to 25% / 110/220VAC -20 to 25%  |
| Frequency:                  | ±3%  |
| Output                      |  |
| Waveform:                   | Quasi-square wave  |
| Voltage Regulation:         | ±5%  |
| Efficiency:                 | 90% or better  |
| Mechanical                  |  |
| Dimensions (in/mm):         | 6.75 x 15 x 9.5 / 171.5 x 381 x 241.5  |
| Finish:                     | Durable powdercoat   |
| Material:                   | Aluminum   |
| Environment                 |  |
| Operating Temperature:      | -40 to 55°C / -40 to 131°F   |
| Safety:                     | CCC, CB, SARFT   |
| Safety - 608 G and 615CE G: | CCC, CB, SARFT, CE (615G)  |
| Standard Features:          | <ul style="list-style-type: none"> <li>• Universal bracket (pole or wall mount)</li> <li>• Output current test points</li> <li>• Input line fuse</li> <li>• Input line switch</li> <li>• Visual output "ON" indicator</li> <li>• Output coaxial terminal</li> <li>• Ground connection</li> <li>• Cable gland (input wiring)</li> </ul> |
| Options:                    | Input line breaker, Indoor mesh cover  |



APX2 G - Cover removed



APX2 G - Indoor mesh cover



APX2 G - Bottom view

Note: Other voltages and configurations may be available.  
For more information, contact your local Alpha sales representative

# Alpha Power Booster (ABP)

HFC Voltage Booster



- Configurable for 90 or 60VAC output voltage
- High-efficiency auto transformer
- Intelligent overload protection
- Water-tight enclosure; wall or stand mounted
- Reverse connection protection
- Input surge protection
- Automatic bypass in the event of downstream network failure

| Electrical                        |  |
|-----------------------------------|--|
| <b>Input Voltage:</b>             | 45 to 65VAC 60Hz / 65 to 90VAC 60Hz                                    |
| <b>Input Current:</b>             | 10 Amps RMS (max.)   |
| <b>Output Voltage:</b>            | 63VAC 60Hz / 87VAC 60Hz  |
| <b>Output Current:</b>            | <8 Amps RMS (max.)   |
| <b>Output Rating:</b>             | 650VA (max.)   |
| <b>Overload Protections:</b>      | 115% of max input current for 27 minutes*                              |
| <b>Short Circuit:</b>             | Bypass mode, automatic recovery  |
| <b>Overload Recovery:</b>         | Automatic  |
| <b>Surge Resistance:</b>          | 6kV / 3000A (IEEE C61.45 part 15)                                      |
| <b>Efficiency:</b>                | >96% at 25 to 100% load  |
| <b>RF Frequency Range:</b>        | 5 to 1000MHz   |
| <b>RF Insertion Loss Maximum:</b> | 1.2dB (5 to 50MHz), 1.2dB (50 to 870MHz), 1.6dB (870 to 1000MHz)       |
| <b>Flatness:</b>                  | ±0.25dB (5 to 50MHz), ±0.35dB (50 to 870MHz), ±0.50dB (870 to 1000MHz) |
| <b>RF Slope Maximum:</b>          | 0.80dB (5 to 50MHz), -1.0dB (50 to 870MHz), -1.25dB (870 to 1000MHz)   |
| <b>Hum Modulation:</b>            | <-68dB (5 to 50MHz), (<82dB freq. domain)                              |
| <b>Return Loss Minimum:</b>       | 17dB (5 to 1000MHz)  |
| <b>Electric Egress:</b>           | <-120dBm (45 to 870MHz)  |
| <b>Isolation:</b>                 | Neutral carries through  |

| Mechanical                           |                                    |
|--------------------------------------|------------------------------------|
| <b>Dimensions L x H x D (in/mm):</b> | 14 x 9.13 x 6.75 / 356 x 232 x 171 |
| <b>Weight (lb/kg):</b>               | 21.4 / 9.7                         |

| Environment                   |                            |
|-------------------------------|----------------------------|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F |
| <b>Storage Temperature:</b>   | -50 to 70°C / -58 to 158°F |
| <b>Outdoor Rating:</b>        | Type 4 enclosure           |

| Standard Compliance |   |
|---------------------|---|
| <b>Safety:</b>      | CSA (C/US), CAN/CSA C22.2 No. 60950-1-07, UL 60950-1, 2nd Edition |

| Standard Features   |  |
|---|--|
| High-efficiency autotransformer, Intelligent overload protection, Water-tight enclosure; wall or stand mounted, LED function indicator light on PCB for troubleshooting |  |



# SmartPack

## Dual Inverter Module Case

- Durable and lightweight case
- Antistatic cushioning to protect Inverter Modules
- Fits any combination of XM2 I<sup>2</sup>M or XM3 Inverters
- Discounted pricing when purchasing case with Inverter Modules
- **Extra compartment space to store:**
  1. Spare component case
  2. DOCSIS<sup>®</sup> transponders

| Weight (lbs/kg)                   |            |
|-----------------------------------|------------|
| Empty IM Case:                    | 6.2 / 2.8  |
| Case with Two I <sup>2</sup> M:   | 20.8 / 9.5 |
| Case with Two IM3:                | 17.4 / 7.9 |
| Case with I <sup>2</sup> M & IM3: | 19.2 / 8.7 |

| Dimensions L x D x H (in/mm)        |  |
|-------------------------------------|--|
| 21.3 x 14.3 x 9.6 / 541 x 363 x 243 |  |



# AlphaGateway SMG

HFC-Enabled Power over Ethernet (PoE+) Gateway



- Create new MSO revenues by leveraging the HFC network
- High bandwidth PoE-powered delivery ideal for security cameras, Wi-Fi, traffic signals, sensors, etc.
- Connection through power passing taps allows mobility to strategically locate devices within proximity of hardline coax
- Dual-PoE ports provide cost-effective backhaul for multiple devices

|   | SMG-01PE-21   | SMG-01PE-24  |
|---|---|--|
| <b>Cable Modem</b>                                |   |  |
| <b>Compliance:</b>                                | DOCSIS 3.0  | EuroDOCSIS 3.0   |
| <b>Transmit Frequency Range:</b>                  | 5 to 85MHz  | 5 to 85MHz   |
| <b>Receive Frequency Range:</b>                   | 88 to 1002MHz   | 108 ~ 1002MHz  |
| <b>Channel Bandwidth:</b>                         | 6MHz  | 8MHz   |
| <b>Downstream Data Rate:</b>                      | Up to 320Mbps (8 Bonded Channels)   | Up to 400Mbps (8 Bonded Channels)  |
| <b>Maximum Operating Level (3 or 4 Channels):</b> | <b>TDMA</b><br>+51dBmV (32QAM, 64QAM)<br>+52dBmV (8QAM, 16QAM)<br>+55dBmV (QPSK)<br><b>S-CDMA</b> (all modulations)<br>+53dBmV  | <b>TDMA</b><br>+111dBμV (32QAM, 64QAM)<br>+112dBμV (8QAM, 16QAM)<br>+115dBμV (QPSK)<br><b>S-CDMA</b> (all modulations)<br>+ 113 dBμV |
| <b>Upstream Data Rate:</b>                        | Up to 100Mbps (4 Bonded Channels)   | Up to 100Mbps (4 Bonded Channels)  |
| <b>Outdoor Hardened:</b>                          | Yes   |  |
| <b>Network Management Protocols:</b>              | SNMPv1, V2C, V3, TFTP   |  |
| <b>Input Connector:</b>                           | RF F-type female  |  |
| <b>Input Impedance:</b>                           | 75 Ohm  |  |
| <b>Privacy:</b>                                   | BPI+  |  |
| <b>Downstream Modulation:</b>                     | 64 or 256 QAM   |  |
| <b>Ethernet</b>                                   |   |  |
| <b>Number of Powered Ethernet Ports:</b>          | 2   |  |
| <b>Connection:</b>                                | 10/100/1000 BASE-T auto sensing/auto-MDIX (8P8C modular jack)   |  |
| <b>Distance:</b>                                  | 100M  |  |
| <b>Power Over Ethernet:</b>                       | <b>Compliance:</b> IEEE 802.3at PoE<br><b>Max Power Out:</b> 34.2W per port<br><b>Max Power at PD (Powered Device):</b> 25W per port<br><b>Voltage Range Out of Base Unit:</b> 50-57V<br><b>Voltage Range at PD:</b> 42.5-57V<br><b>Max Current:</b> 600mA per port |  |
| <b>Remote PoE Port Power Control:</b>             | On, off, reset (per port)   |  |
| <b>Remote PoE Status:</b>                         | Link up/down, link speed, power up/down, PoE device class, PoE power consumption  |  |
| <b>Remote PoE Device Status:</b>                  | MAC address, IPv4/IPv6 address  |  |
| <b>Environment</b>                                |   |  |
| <b>Input Voltage:</b>                             | 42 to 100VAC, 50/60Hz (HFC plant powered)   |  |
| <b>Power Consumption:</b>                         | 8W + PoE Loading  |  |
| <b>Operating Temperature:</b>                     | -40 to 65°C (-40 to 149°F)  |  |
| <b>Storage Temperature:</b>                       | -40 to 85°C (-40 to 185°F)  |  |
| <b>Humidity:</b>                                  | 10 to 90%, non-condensing   |  |
| <b>Regulatory Compliance:</b>                     | <b>Environmental:</b> UL50E / NEMA 6; IEC 60529: IP67<br><b>Safety:</b> UL/IEC/EN 60950-1: ED2<br><b>Surge:</b> SCTE 81<br><b>EMC:</b> FCC Class A (FCC CFR 47 Part 15 Class A), ICES-003<br><b>RoHS:</b> Directive 2011/65/EU                                      |  |
| <b>Physical</b>                                   |   |  |
| <b>Mounting Options:</b>                          | Strand, pole, wall, vault   |  |
| <b>Dimensions H x W x D (in/mm):</b>              | 8.7 x 12 x 5.8 / 222 x 308 x 148.1  |  |
| <b>Weight (lb/kg):</b>                            | 9.6 / 4.35  |  |

# Alpha XM360

Maintenance Management System



- XM360 expedites outside plant power system maintenance
- Collects data and provides answers to locations at risk
- Provides asset tracking for power supplies, batteries, transponders and enclosures
- Generates reliability plans, connecting field operations with finance and corporate c-suite

Implementing a **Maintenance Management System (MMS)** into the network gives MSO's enhanced visibility of the growing risk of an aging OSP network. Improved visibility and control provides operators the **tools and information to take appropriate corrective action before outages occur**—ensuring superior network reliability and mitigating threats from competitive fiber technologies.



**X-TRACTOR** MMS is a Windows-based tool kit that **guarantees consistency when performing preventative maintenance (PM) procedures** by electronically connecting all power supply system element information and generating a PM certification report that is uploaded to a secure hosted database.

- Cable/broadband industry's first software tool providing error-free PM procedures
- Provides the most effective means to collect vital information on power systems
- Generates PM certification reports for online viewing from a secure hosted database
- Windows-based, laptop compatible

**PM CERTIFICATION REPORT**  
INSTALL | MAINTAIN | REPAIR | VALIDATE

| Site Data           |                      | ALPHA             |                        |                       |   | Site ID: NRJ-16       |                    |                |                            |               |             |
|---------------------|----------------------|-------------------|------------------------|-----------------------|---|-----------------------|--------------------|----------------|----------------------------|---------------|-------------|
| Latitude            | 48.78514             | Longitude         | -122.62413             | Date                  | Sep. 17, 2013                                     | Time                  | 10:58 AM           | Transformer #  | N/A                        |               |             |
| Hub                 | BELLEVUE             | City              | BELLEVUE               | State                 | WA  | Zip Code              | 98003              |                |                            |               |             |
| Region              | PNW                  | System            | SPWATCOM               | Node                  | 7A-200  | Country               | USA                |                |                            |               |             |
| Project ID          | XM360                | Project           | 3500 ALPHA MAX         | Utility Company       | PSB   | Site #                | N/A                |                |                            |               |             |
| Business Service    | YES                  | Utility Account # | 123ABC                 | Utility Meter #       | 2248-15   | Powering A Node       | NO                 |                |                            |               |             |
| Transponder Data    |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| GM Mac Address      | 00:90:EA:34:DA:04    | SNR               | 454                    | CER                   | 0.0   | Logic Card            |                    | Transmit Power | 41.2                       | Receive Power | 5.7         |
| GM IP Address       | 216.57.221.200       | Transponder Type  | DPM                    | Firmware              | OPM-4.4.9.0_03.13_NA                              | Timeouts              | 0                  | Timeouts       | 0                          |               |             |
| SNMP TRAPS          |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| Trap 1              | 0.0.0.0              | Trap 2            | 0.0.0.0                | Trap 3                | 0.0.0.0   | Trap 4                | 0.0.0.0            |                |                            |               |             |
| Alpha MB 1          | 0.0.0.0              | Alpha MB 2        | 0.0.0.0                | Alpha MB 3            | 0.0.0.0   | Alpha MB 4            | 0.0.0.0            |                |                            |               |             |
| UPSTREAM            |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| Frequency           | 25.000               | Modulation        | QPSK                   | Lock                  | NA  | Channel ID            | 1                  | Symbol Rate    | 2.560                      |               |             |
| Frequency           | 369.000              | Modulation        | 256 QAM                | Lock                  | LOCKED  | Channel ID            | 1                  | Symbol Rate    | 5.56537                    |               |             |
| Power Supply Data   |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| Make-Model          | ALPHA-000-51ED-181   | Daily Code        | 050712                 | 0912                  | Reluct Date                                       | 050712                | Self-Test          | Duration (min) | 10                         |               |             |
| Firmware Version    | V1.07.0              | Edge Rel. Date    | 83                     |                       | Event Log   | Clear                 | NO                 | Self-Test      | Interval (days)            | 30            |             |
| PM/DOC Interval     | YES                  | Output VAC        | 90                     |                       | 150V/0V   | 200V                  |                    |                |                            |               |             |
| Power Supply Events |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| Power Supply #      | Number               | Time              | AC Input Voltage (VAC) | Output Voltage (VAC)  | Lock  | NA                    | Output Current (A) | Primary (1)    | Secondary (2 - If Present) |               |             |
| PS1                 | 48                   | 351               | 121.2                  | 87.0                  |   |                       | 0.00               |                | 12.00                      |               |             |
| Battery Data        |                      |                   |                        |                       |   |                       |                    |                |                            |               |             |
| Self-Test           | Verified             | YES               | Self-Test              | Start Time            | 11:00:07  | Self-Test             | End Time           | 11:09:11       | Battery Temperature        | PS 1C         | 49.8 / 21.0 |
| Battery #           | Battery Manufacturer | Date Code (MMYY)  | ID #                   | Voltage No Load (VDC) | Voltage Under Load (VDC) After 5 Minute Bulk Test | BB Conductance (mhos) | Meter Reading      | Connected TTFP |                            |               |             |
| 10                  | DELTA ELECTRONICS    |                   |                        | 12.8                  | 12.6  | 10.1                  | 10.1               | 2.00h          |                            |               |             |



**EXECUTIVE REPORTS** is an **intuitive, web-based suite of reports** that provides insight on at-risk locations along with the type and age of assets. Ground breaking algorithms provide detailed information on the health status of the outside plant power system network.

- Enables network operating personnel to effectively manage their entire OSP network
- Provides analysis of aging power supplies, batteries and transponders so operators can proactively deploy the right fix agency to prevent failures
- Targets existing budgets to eliminate risks at your highest priority sites
- Viewable on iOS and Android mobile devices



# DM3.0

Alpha's DOCSIS 3.0 Integrated Management Hub



- Power Supply Monitoring
- Integrated Power Management
- Network Test Probe
- Network Backhaul Gateway

| Features                              |   |
|---------------------------------------|---|
| <b>Supported Power Supply Models:</b> | XM3-HP series, XM2-HP series and XM2 series   |
| <b>Models:</b>                        | <b>DM3 (DOCSIS) &amp; DM3E (EuroDOCSIS):</b> Compatible with XM3 power supplies<br><b>DM3X (DOCSIS) &amp; DM3EX (EuroDOCSIS):</b> Compatible with XM2 and XM3 power supplies  |
| <b>Ethernet Port:</b>                 | 1 port, auto-MDX, RJ45, 10/100/1000Mbps   |
| <b>PoE (Optional):</b>                | IEEE 802.3at compliant, type 2, Power over Ethernet mid-span power source PSE   |
| <b>Battery Monitoring:</b>            | <b>DM3:</b> Individual battery voltages monitored via XM3 embedded AlphaGuard<br><b>DM3X:</b> Individual battery voltages monitored via direct sense harness. Up to 16 individual batteries configured in 1, 2, 3 or 4 strings of 36 or 48V batteries |
| <b>Power Systems:</b>                 | <b>DM3X:</b> Up to 5 XM2 or XM3 power supplies and/or an AlphaGen curbside generator. System management includes coordinated battery charging, system test and aggregated alarm   |

| Physical and Environmental           |   |
|--------------------------------------|---|
| <b>Installation:</b>                 | Alpha XM2 and XM3 broadband UPS specific. Inverter module co-installed via internal interface connectors  |
| <b>Power:</b>                        | <b>XM3:</b> 12W max, internal power connection<br><b>XM2:</b> 12W max, combined internal power connection and battery string connection (24, 36 or 48V battery strings), internal low voltage disconnect protects batteries from over discharge   |
| <b>Dimensions H x W x D (in/mm):</b> | 5.6 x 1.1 x 7.4 / 143 x 28 x 188  |
| <b>Weight (oz/g):</b>                | 10.7 / 304  |
| <b>Operating Temperature:</b>        | -40 to 149°F / -40 to 65°C  |
| <b>Storage Temperature:</b>          | -40 to 185°F / -40 to 85°C  |
| <b>Humidity:</b>                     | 10 to 90% non-condensing  |
| <b>Regulatory Compliance:</b>        | <ul style="list-style-type: none"> <li>• FCC Part 15 Class A</li> <li>• EN 50083-2 EMC requirements for CATV equipment,</li> <li>• EN 62040-2 EMC requirements for uninterruptible power supplies</li> <li>• <b>Surge:</b> IEEE C62.41, 6kV combined wave with external surge protector</li> <li>• <b>RoHS:</b> Directive 2002/95/EC</li> </ul> |

| Cable Modem               |  |
|---------------------------|--|
| <b>Standard:</b>          | <ul style="list-style-type: none"> <li>• DOCSIS 3.0 with 8x4 bonded channels</li> <li>• EuroDOCSIS 3.0 with 8x4 bonded channels</li> </ul>   |
| <b>Data Rates:</b>        | <b>Downstream:</b> 300Mbps, 8 bonded channels (DOCSIS), 400Mbps, 8 bonded channels (EuroDOCSIS)<br><b>Upstream:</b> 100Mbps, 4 bonded channels (DOCSIS and EuroDOCSIS)<br>Data rates consistent across entire operating temperature range and through all power supply operating modes and transitions |
| <b>Frequency:</b>         | <b>DOCSIS:</b> 5 to 42MHz upstream, 88 to 1002MHz downstream<br><b>EuroDOCSIS:</b> 5-65MHz upstream, 108-1002MHz downstream  |
| <b>Channel Bandwidth:</b> | <b>DOCSIS:</b> 6MHz<br><b>EuroDOCSIS:</b> 8MHz   |

| Advanced Diagnostics              |  |
|-----------------------------------|--|
| <b>RF Network:</b>                | <ul style="list-style-type: none"> <li>• Full Band Capture data available through Broadcom MIB and DM3.0 internal web server</li> <li>• Constellation diagram available via DM3.0 internal web server</li> <li>• Micro-reflection diagram available via DM3.0 internal web server</li> </ul> |
| <b>Power Supply Display:</b>      | With DM3.0 installed, power supply display will show advanced network diagnostics including: upstream and downstream frequencies and RF levels, IPv4 or IPv6 address assigned by network DHCP server, MAC address, DOCSIS timeout error codes and firmware versions                          |
| <b>Utility Power Diagnostics:</b> | With XM3 app card, utility performance status including outages, sags, surges, and out of frequency events   |
| <b>Battery Diagnostics:</b>       | With XM3 app card, power supply diagnostics report when batteries should be serviced including battery string runtime remaining and battery life remaining   |
| <b>Event Logging:</b>             | With XM3 app card, logs include power supply events, power supply configurations and battery events  |

| Status Monitoring                                    |   |
|--|---|
| <b>Standards:</b>                                    | <b>ANSI/SCTE 38-4:</b> Hybrid fiber/coax outside plant status monitoring SCTE-HMS-PS-MIB management information base<br><b>ANSI/SCTE 38-6:</b> Hybrid fiber/coax outside plant status monitoring SCTE-HMS-GEN-MIB management information base<br><ul style="list-style-type: none"> <li>• Alpha proprietary, portable generator management information base</li> <li>• Cheetah proprietary KPI management information base</li> </ul> |
| <b>Power Supply Monitored Parameters (ANSI-HMS):</b> | Major alarm, minor alarm, input voltage, output voltage, output current, output power, input current, input power, UPS status, charger current, battery discharge current, battery voltage, battery temperature, remote test control, enclosure door  |
| <b>Portable Generators:</b>                          | <b>Models:</b> AlphaGen DCX2000, DCX3000<br><b>Monitored Parameters:</b> Generator connected, generator running, generator runtime  |
| <b>Curbside Generators:</b>                          | <b>Models:</b> AlphaGen 3.5, 5.0 and 7.5kW vis AlphaBus interface<br><b>Monitored Parameters:</b> Status, alarms, gas hazard, water intrusion, pad shear, enclosure door, ignition battery voltage, enclosure temperature, low fuel, remote test control  |

| Ordering Information (For XM3 Power Supplies) |  |
|---|--|
| <b>X3-DM3:</b>                                | Alpha embedded DOCSIS 3.0 transponder with backhaul and Full Band Capture, XM3 installed with embedded AlphaGuard  |
| <b>X3-DM3E:</b>                               | Alpha embedded EuroDOCSIS 3.0 transponder with backhaul and Full Band Capture, XM3 installed with embedded AlphaGuard  |
| <b>X3-DM3X:</b>                               | Alpha embedded DOCSIS 3.0 transponder with backhaul and Full Band Capture, XM3 installed (NO embedded AlphaGuard), up to 4 battery strings, curbside generator and 5 power supplies    |
| <b>X3-DM3EX:</b>                              | Alpha embedded EuroDOCSIS 3.0 transponder with backhaul and Full Band Capture, XM3 installed (NO embedded Alpha Guard), up to 4 battery strings, curbside generator & 5 power supplies |

| Ordering Information (For XM2 Power Supplies) |  |
|---|--|
| <b>X2-DM3X:</b>                               | Alpha embedded DOCSIS 3.0 transponder with backhaul and Full Band Capture, XM2 installed, up to 4 battery strings, curbside generator & 5 power supplies     |
| <b>X2-DM3EX:</b>                              | Alpha embedded EuroDOCSIS 3.0 transponder with backhaul and Full Band Capture, XM2 installed, up to 4 battery strings, curbside generator & 5 power supplies |

# AlphaNet™ EDH4

Eternal DOCSIS® Transponder



- Add DOCSIS® status monitoring capability to existing power supplies
- Supports standard networking interfaces including SNMP, Web access and ANSI/SCTE MIBs
- Multiple power supply models supported
- Embedded Web server for remote diagnostics
- Optional VoIP testing features

| Specifications                   |  |
|----------------------------------|--|
| <b>Power Supplies Supported:</b> | XM2-HP, XM2 (requires USM2 or USM2.5), XM (requires APM/USM) Lectro ZTT, ZTT+ AM (requires RPM card) |
| <b>DOCSIS Compatibility:</b>     | DOCSIS 1.1, 2.0  |
| <b>Monitoring Protocol:</b>      | SNMP v1, v2, v3  |
| <b>Devices Monitored:</b>        | Power supplies, batteries, generators <sup>1</sup>   |

| RF Transmit/Receive                    |  |
|--|--|
| <b>Tx Frequency Range:</b>             | 5 to 42MHz                                 |
| <b>Output Power:</b>                   | 8 to 58dBmV                                |
| <b>Channel Bandwidth:</b>              | 6MHz                                       |
| <b>Receive Center Frequency Range:</b> | 91 to 857MHz (Standard, HRC, IRC channels) |
| <b>Input Level:</b>                    | -15 to 15dBmV                              |

| Monitored Parameters (Power Supply Data) |  |                |                |                |
|--|--|----------------|----------------|----------------|
| Model:                                   | XM2-HP/XM2   | XM             | AM             | ZTT Series     |
| <b>Major Alarm:</b>                      | ■  | ■              | ■              | ■              |
| <b>Minor Alarm:</b>                      | ■  | ■              | ■              | ■              |
| <b>Input Line Voltage:</b>               | ■  | ■ <sup>2</sup> | ■ <sup>2</sup> | ■ <sup>2</sup> |
| <b>Output Voltage:</b>                   | ■  | ■              | ■              | ■ <sup>2</sup> |
| <b>Battery Voltage:</b>                  | ■  | ■              | ■              | ■              |
| <b>Output Current:</b>                   | ■  | ■              | ■              | ■ <sup>2</sup> |
| <b>Standby/AC Line Fail:</b>             | ■  | ■              | ■              | ■              |
| <b>Equipment/Test Fail:</b>              | ■  | ■              | ■              | —              |
| <b>Enclosure Door Status:</b>            | ■  | ■              | ■              | ■              |
| <b>Remote Test Control:</b>              | ■  | ■              | ■              | ■              |
| <b>Number of Battery Strings:</b>        | Up to four 36V or 48V strings                                |                |                |                |
| <b>Battery Data:</b>                     | Individual battery voltages, battery compartment temperature |                |                |                |

| Hardware                             |                                      |
|--------------------------------------|--------------------------------------|
| <b>Dimensions H x W x D (in/mm):</b> | 1.3 x 8.6 x 5.2 / 33 x 218 x 132     |
| <b>RF Cable Interface:</b>           | F-connector, female, 75Ohm impedance |
| <b>Local/Craft Interface:</b>        | RJ45 Ethernet                        |

| Environment                   |  |
|-------------------------------|--|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F   |
| <b>Humidity:</b>              | 10 to 90% non-condensing   |
| <b>Emissions:</b>             | EN55022 Class A and FCC Part 15 Class A (Installed in power supply enclosure system) |
| <b>Warranty:</b>              | 2 years  |

| Management       |   |
|------------------|---|
| <b>NMS/EMS:</b>  | Standard SNMP Management Tools  |
| <b>HMS MIBs:</b> | In addition to the standard DOCSIS MIBs, the transponder supports the following HMS MIBs: <ul style="list-style-type: none"> <li>• SCTE 25-3 (HMS-022): - Interface</li> <li>• SCTE 36 (HMS-050): - Root</li> <li>• MIB SCTE 37 (HMS-072): - Tree</li> <li>• MIB SCTE 38-1 (HMS-026): - Property</li> <li>• MIB SCTE 38-2 (HMS-023): - Alarm MIB</li> <li>• SCTE 38-3 (HMS-024): - Common</li> <li>• MIB SCTE 38-4 (HMS-027): - Power Supply</li> <li>• MIB SCTE 38-6 (HMS-033): - Generator</li> <li>• MIB SCTE 38-7 (HMS-050): - TIB MIB</li> </ul> |

<sup>1</sup> Reported as per ANSI/SCTE 25-3 2002 (HMS-022).  
<sup>2</sup> Requires optional cable assembly.

# AlphaNet™ DSM3 Family

DOCSIS® Status Monitor for XM2, GMX & VMX

- Embedded network management for Alpha broadband power supplies
- Battery and power supply advanced diagnostics reduces truck rolls and overall operating expense of maintaining a network
- **Three models available:** DSM3 (standard), DSM3x (advanced) and DPM (XM2-300HP)

| General Details                              |   |
|--|---|
| <b>Battery Monitoring:</b>                   | <b>DSM3:</b> Up to two strings of 36 or 48V batteries, <b>DSM3x:</b> Up to four strings of 36 or 48V batteries, <b>DPM:</b> One 12V battery                   |
| <b>Power System Management (DSM3x Only):</b> | Up to five power supplies and an AlphaGen generator are managed from a single DSM3x including coordinated battery charging, system test and aggregated alarm. |
| <b>Management Protocol:</b>                  | Standard ANSI/SCTE HMS MIBs support basic power supply monitoring. Advanced diagnostics with battery and power module analytics available via secure SNMP.    |

| Advanced Diagnostics <sup>1</sup>                        |  |
|--|--|
| <b>Intelligent Power Supply Interface:</b>               | <b>Power supply user interface displays advanced diagnostics including:</b> DOCSIS modem upstream and downstream RF levels, IP address assigned by network DHCP server, MAC address and firmware levels.   |
| <b>Battery State of Health (Requires AlphaAPPs):</b>     | Power supply internal analytic diagnostics report when batteries should be serviced. <ul style="list-style-type: none"> <li>• Battery String Runtime Remaining</li> <li>• Battery Life Remaining</li> </ul>  |
| <b>Utility Status &amp; Events (Requires AlphaAPPs):</b> | <b>AC Line Status</b> <ul style="list-style-type: none"> <li>• Utility Performance Status (outages, sags, surges, frequency)</li> <li>• Utility Events (24-hour and lifetime number of events)</li> </ul>  |
| <b>Network Tools:</b>                                    | <b>QAM constellation diagram</b> <ul style="list-style-type: none"> <li>• Identify types of interference and distortion in downstream RF signal.</li> </ul> <b>Microreflections meter</b> <ul style="list-style-type: none"> <li>• Locate microreflections detected in Coax caused by physical impairments.</li> </ul> |
| <b>History Log Reports:</b>                              | <ul style="list-style-type: none"> <li>• Power Supply Event Log (events of daily power supply operation)</li> <li>• Power Supply Configuration Log (events that occur infrequently)</li> <li>• Battery Event Log (battery conductance measurements and battery manufactured dates)</li> </ul>                          |

| Hardware                         |   |
|----------------------------------|---|
| <b>RF Cable Interface:</b>       | F-connector, female, 75ohm, connector angle accommodates coax bend radius when installed in some enclosures                     |
| <b>Local Interface:</b>          | RJ-45, Ethernet, multi-mode operation   |
| <b>LED Indicators:</b>           | Ready/Alarm, Upstream registration, Downstream lock, AlphaBus, RF level, Link, CPE traffic, Battery Harness Correct             |
| <b>I/O Control (DSM3x Only):</b> | <b>6-Pin Molex:</b> Digital input, Digital output, 5V, Common   |
| <b>AlphaBus:</b>                 | <b>RJ-11 offset tab:</b> Multi-power supply and AlphaGen communications   |
| <b>Battery Monitoring:</b>       | <b>DSM3:</b> 8-pin Molex battery string A/B<br><b>DSM3x:</b> 8-pin Molex battery string A/B and 8-pin Molex battery string C/D. |
| <b>Tamper:</b>                   | NO or NC, software configurable, reads enclosure door magnetic switch   |

| Environment                   |  |
|-------------------------------|--|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F   |
| <b>Storage Temperature:</b>   | -40 to 85°C / -40 to 185°F   |
| <b>Humidity:</b>              | 10 to 90% non-condensing   |
| <b>Regulatory Compliance:</b> | FCC Part 15 Class A, EN 50083-2:2006 EMP requirements for CATV equipment, EN 62040-2:2006 Uninterruptible power supply EMC requirements, Category C2, Surge: IEEE 587, Category B3 <b>RoHS:</b> Directive 2002/95/EC |

| Network Communications             |  |
|------------------------------------|--|
| <b>DOCSIS (RF) Port Protocols:</b> | IP, UDP, TCP, DHCP, TFTP, SNMPv1, SNMPv2c, HTTP  |
| <b>Ethernet Port:</b>              | <b>Local Mode:</b> HTTP web interface for local craft diagnosis.<br><b>CPE Mode:</b> DOCSIS Cable modem Ethernet CPE functionality   |
| <b>MIBs:</b>                       | <ul style="list-style-type: none"> <li>• Power supply (ANSI/SCTE 38-4)</li> <li>• Other SCTE HMS MIBs as defined by the SCTE for power supply and generator status monitoring</li> <li>• Alpha proprietary advanced UPS diagnostics</li> </ul> |

| Power Supply Monitored Parameters |  |
|-----------------------------------|--|
| <b>Major Alarm:</b>               | <b>Aggregate alarm consisting of:</b> Test fail, battery fail, line insulation alarm, output overload, inverter, over-temperature, N+1 active, fuse fail.  |
| <b>Minor Alarm:</b>               | <b>Aggregate alarm consisting of:</b> Temperature probe error, AC line loss, N+1 error   |
| <b>Input Voltage:</b>             | Reported from power supply V(in) measurement   |
| <b>Output Voltage:</b>            | Reported from power supply V(out) measurement  |
| <b>Output Current:</b>            | <b>DSM3 and DSM3x:</b> 0 to 25A standard on port 1. Ports 2-4 require power supply option.<br><b>DPM:</b> Dual outputs do not exceed 300W combined 3.5A at 90VAC output voltage, 5A at 60VAC output voltage. |



DSM3

DSM3x

DPM

| Power Supply Monitored Parameters (Cont.) |  |
|---|--|
| <b>Output Power:</b>                      | Reported in AC Watts   |
| <b>UPS Status:</b>                        | AC line, standby, test in process, test alarm  |
| <b>Battery Voltage:</b>                   | <b>DSM3x:</b> Individual battery voltage, up to four strings of 3-4 batteries (maximum 16 batteries), ±100mV per battery. <b>DSM3:</b> Individual battery voltage, up to two strings of 3-4 batteries (maximum 8 batteries), ±100mV per battery. <b>DPM:</b> Individual battery voltage. |
| <b>Battery Temperature:</b>               | Reported from power supply battery Remote Temperature Sensor (RTS)   |
| <b>Remote Test Control:</b>               | Start/Stop power supply test cycle   |
| <b>Enclosure Door:</b>                    | Open or Closed   |

| AlphaGen Generator Monitored Parameters (DSM3x Only) |  |
|--|--|
| <b>Status:</b>                                       | Generator Off, Running, Alarm  |
| <b>Generator Alarms:</b>                             | <b>Aggregate alarm consisting of:</b> low oil pressure, engine over-temp, engine over-speed, crank limit, over voltage, low fuel, water intrusion, pad shear, gas hazard, test fail. |
| <b>Gas Hazard:</b>                                   | OK, Alarm  |
| <b>Water Intrusion:</b>                              | OK, Alarm  |
| <b>Pad Shear:</b>                                    | OK, Alarm  |
| <b>Enclosure Door:</b>                               | Open, Alarm  |
| <b>Ignition Battery Voltage:</b>                     | Reported in DC volts, ±100mV   |
| <b>Enclosure Temperature:</b>                        | Reported in Celcius, ±2°C  |
| <b>Low Fuel:</b>                                     | OK, Alarm  |
| <b>Remote Test Control:</b>                          | Start/Stop generator test cycle  |

| AlphaGen DCX Generator (DSM3x and DPM Only) |  |
|---|--|
| <b>Status:</b>                              | Generator Detected, Powering Load  |
| <b>Time Powering Load:</b>                  | An incremental timer that reports the amount of time in minutes the generator has been powering the load. Alarm threshold can be set to notify when to refuel generator. |

| Cable Modem                            |   |   |
|--|---|---|
| <b>Compliance:</b>                     | DOCSIS 1.1 and 2.0  | EuroDOCSIS 2.0  |
| <b>Transmit Frequency Range:</b>       | 5 to 42Mhz  | 5 to 65 MHz   |
| <b>Receive Center Frequency Range:</b> | 91 to 857Mhz  | 112 to 858 MHz  |
| <b>Output Power Range:</b>             | <b>TDMA:</b><br>+8 to +54 dBmV (32QAM, 64QAM)<br>+8 to +55 dBmV (8QAM, 16QAM)<br>+8 to +58 dBmV (QPSK)<br><b>S-CDMA:</b><br>+8 to +53 dBmV<br>(All modulations of S-CDMA) | <b>TDMA:</b><br>+68 to +114 dBuV (32QAM, 64QAM)<br>+68 to +115 dBuV (8QAM, 16QAM)<br>+68 to +118 dBuV (QPSK)<br><b>S-CDMA:</b><br>+68 to +113 dBuV<br>(All modulations of S-CDMA) |
| <b>Input Signal Range:</b>             | -15 to +15dBmV  | <b>64QAM:</b> +43 to +73 dBuV<br><b>256QAM:</b> +47 to +77 dBuV   |
| <b>Channel Bandwidth:</b>              | 6Mhz  | 8MHz  |

| Additional Equipment                          |  |
|---|--|
| <b>XP-BSC-3-6:</b>                            | Wire Kit, Battery Sense, 1x36V, 6'   |
| <b>XP-BSC-6-6:</b>                            | Wire Kit, Battery Sense, 2x36V, 6'   |
| <b>XP-BSC-4-6:</b>                            | Wire Kit, Battery Sense, 1x48V, 6'   |
| <b>Surge Arrestor (Alpha p/n 162-028-10):</b> | Female/Female connector configuration, "F" Type connector with integral ground block required for all installations. |

# AlphaNet™ DSM3 Family

## DOCSIS® Status Monitor for XM3-HP

- Embedded network management for Alpha broadband power supplies
- **Three models available:** DSM3 (standard), DSM3x (advanced) and DPM (used with Smart AlphaGuard option)

| General Details                              |  |
|--|--|
| <b>Battery Monitoring:</b>                   | <b>DSM3:</b> Up to two strings of 36 or 48V batteries, <b>DSM3x:</b> Up to four strings of 36V batteries, <b>DPM:</b> Up to four strings of 36V batteries with AlphaGuard option |
| <b>Power System Management (DSM3x Only):</b> | Up to five power supplies and an AlphaGen generator are managed from a single DSM3x including coordinated battery charging, system test and aggregated alarm.                    |
| <b>Management Protocol:</b>                  | Standard ANSI/SCTE HMS MIBs support basic power supply monitoring. Advanced diagnostics with battery and power module analytics available via secure SNMP.                       |

| Advanced Diagnostics <sup>1</sup>                        |  |
|--|--|
| <b>Intelligent Power Supply Interface:</b>               | <b>Power supply user interface displays advanced diagnostics including:</b> DOCSIS modem upstream and downstream RF levels, IP address assigned by network DHCP server, MAC address and firmware levels.   |
| <b>Battery State of Health (Requires AlphaAPPs):</b>     | Power supply internal analytic diagnostics report when batteries should be serviced. <ul style="list-style-type: none"> <li>• Battery String Runtime Remaining</li> <li>• Battery Life Remaining</li> </ul>  |
| <b>Utility Status &amp; Events (Requires AlphaAPPs):</b> | <b>AC Line Status</b> <ul style="list-style-type: none"> <li>• Utility Performance Status (outages, sags, surges, frequency)</li> <li>• Utility Events (24-hour and lifetime number of events)</li> </ul>  |
| <b>Network Tools:</b>                                    | <b>QAM constellation diagram</b> <ul style="list-style-type: none"> <li>• Identify types of interference and distortion in downstream RF signal.</li> </ul> <b>Microreflections meter</b> <ul style="list-style-type: none"> <li>• Locate microreflections detected in Coax caused by physical impairments.</li> </ul> |
| <b>History Log Reports:</b>                              | <ul style="list-style-type: none"> <li>• Power Supply Event Log (events of daily power supply operation)</li> <li>• Power Supply Configuration Log (events that occur infrequently)</li> <li>• Battery Event Log (battery conductance measurements and battery manufactured dates)</li> </ul>                          |

| Hardware                         |   |
|----------------------------------|---|
| <b>RF Cable Interface:</b>       | F-connector, female, 750hm, connector angle accommodates coax bend radius when installed in some enclosures                     |
| <b>Local Interface:</b>          | RJ-45, Ethernet, multi-mode operation   |
| <b>LED Indicators:</b>           | Ready/Alarm, Upstream registration, Downstream lock, AlphaBus, RF level, Link, CPE traffic, Battery Harness Correct             |
| <b>I/O Control (DSM3x Only):</b> | <b>6-Pin Molex:</b> Digital input, Digital output, 5V, Common   |
| <b>AlphaBus:</b>                 | <b>RJ-11 offset tab:</b> Multi-power supply and AlphaGen communications   |
| <b>Battery Monitoring:</b>       | <b>DSM3:</b> 8-pin Molex battery string A/B<br><b>DSM3x:</b> 8-pin Molex battery string A/B and 8-pin Molex battery string C/D. |
| <b>Tamper:</b>                   | NO or NC, software configurable, reads enclosure door magnetic switch   |

| Environment                   |   |
|-------------------------------|---|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F  |
| <b>Storage Temperature:</b>   | -40 to 85°C / -40 to 185°F  |
| <b>Humidity:</b>              | 10 to 90% non-condensing  |
| <b>Regulatory Compliance:</b> | FCC Part 15 Class A, EN 50083-2:2006 EMP requirements for CATV equipment, EN 62040-2:2006 Uninterruptible power supply EMC requirements, Category C2, <b>Surge:</b> IEEE 587, Category B3 <b>RoHS:</b> Directive 2002/95/EC |

| Network Communications             |  |
|------------------------------------|--|
| <b>DOCSIS (RF) Port Protocols:</b> | IPv4, IPv6, UDP, TCP, DHCP, TFTP, SNMPv1, SNMPv2c, SNMPv3, HTTP  |
| <b>Ethernet Port:</b>              | HTTP web interface for local craft diagnosis.  |
| <b>MIBs:</b>                       | <ul style="list-style-type: none"> <li>• Power supply (ANSI/SCTE 38-4)</li> <li>• Other SCTE HMS MIBs as defined by the SCTE for power supply and generator status monitoring</li> <li>• Alpha proprietary advanced UPS diagnostics</li> </ul> |

| Power Supply Monitored Parameters |  |
|-----------------------------------|--|
| <b>Major Alarm:</b>               | <b>Aggregate alarm consisting of:</b> Test fail, line isolation, output failure, output overload, output tripped, charger failure, inverter temperature, configuration error, inverter failure, no batteries, battery failure. |
| <b>Minor Alarm:</b>               | <b>Aggregate alarm consisting of:</b> AC line loss, input over current/input current limit, surge MOV failure, charger enable, option board failure, battery temperature probe error.  |
| <b>Input Voltage:</b>             | Reported from power supply V(in) measurement   |
| <b>Output Voltage:</b>            | Reported from power supply V(out) measurement  |
| <b>Output Current:</b>            | 0 to 25A standard on port 1, port 2 requires power supply DOC option   |
| <b>Output Power:</b>              | Reported in AC Watts   |
| <b>Input Current:</b>             | Reported in Amps   |
| <b>Input Power:</b>               | Reported in AC Watts   |



DSM3

DSM3x

DPM

| Power Supply Monitored Parameters (Cont.) |  |
|---|--|
| <b>UPS Status:</b>                        | AC line, standby, test in process, test alarm  |
| <b>Charger Current:</b>                   | Reported in Amps   |
| <b>Battery Discharge Current:</b>         | Reported in Amps   |
| <b>Battery Voltage:</b>                   | <b>DSM3x:</b> Individual battery voltage, up to four strings of 3-4 batteries (maximum 16 batteries), ±100mV per battery. <b>DSM3:</b> Individual battery voltage, up to two strings of 3-4 batteries (maximum 8 batteries), ±100mV per battery. <b>DPM:</b> Individual battery voltage. |
| <b>Battery Temperature:</b>               | Reported from power supply battery Remote Temperature Sensor (RTS)   |
| <b>Remote Test Control:</b>               | Start/Stop power supply test cycle   |
| <b>Enclosure Door:</b>                    | Open or Closed   |

| AlphaGen Generator Monitored Parameters (DSM3x Only) |  |
|--|--|
| <b>Status:</b>                                       | Generator Off, Running, Alarm  |
| <b>Generator Alarms:</b>                             | <b>Aggregate alarm consisting of:</b> low oil pressure, engine over-temp, engine over-speed, crank limit, over voltage, low fuel, water intrusion, pad shear, gas hazard, test fail. |
| <b>Gas Hazard:</b>                                   | OK, Alarm  |
| <b>Water Intrusion:</b>                              | OK, Alarm  |
| <b>Pad Shear:</b>                                    | OK, Alarm  |
| <b>Enclosure Door:</b>                               | Open, Alarm  |
| <b>Ignition Battery Voltage:</b>                     | Reported in DC volts, ±100mV   |
| <b>Enclosure Temperature:</b>                        | Reported in Celsius, ±2°C  |
| <b>Low Fuel:</b>                                     | OK, Alarm  |
| <b>Remote Test Control:</b>                          | Start/Stop generator test cycle  |

| AlphaGen DCX Generator (DSM3x and DPM Only) |  |
|---|--|
| <b>Status:</b>                              | Generator Detected, Powering Load  |
| <b>Time Powering Load:</b>                  | An incremental timer that reports the amount of time in minutes the generator has been powering the load. Alarm threshold can be set to notify when to refuel generator. |

| Cable Modem                            |   |   |
|--|---|---|
| <b>Compliance:</b>                     | <b>DOCSIS 1.1 and 2.0</b>   | <b>EuroDOCSIS 2.0</b>   |
| <b>Transmit Frequency Range:</b>       | 5 to 42MHz  | 5 to 65 MHz   |
| <b>Receive Center Frequency Range:</b> | 91 to 857MHz  | 112 to 858 MHz  |
| <b>Output Power Range:</b>             | <b>TDMA:</b><br>+8 to +54 dBmV (32QAM, 64QAM)<br>+8 to +55 dBmV (80AM, 160AM)<br>+8 to +58 dBmV (QPSK)<br><b>S-CDMA:</b><br>+8 to +53 dBmV<br>(All modulations of S-CDMA) | <b>TDMA:</b><br>+68 to +114 dBuV (32QAM, 64QAM)<br>+68 to +115 dBuV (80AM, 160AM)<br>+68 to +118 dBuV (QPSK)<br><b>S-CDMA:</b><br>+68 to +113 dBuV<br>(All modulations of S-CDMA) |
| <b>Input Signal Range:</b>             | -15 to +15dBmV  | <b>64QAM:</b> +43 to +73 dBuV<br><b>256QAM:</b> +47 to +77 dBuV   |
| <b>Channel Bandwidth:</b>              | 6MHz  | 8MHz  |

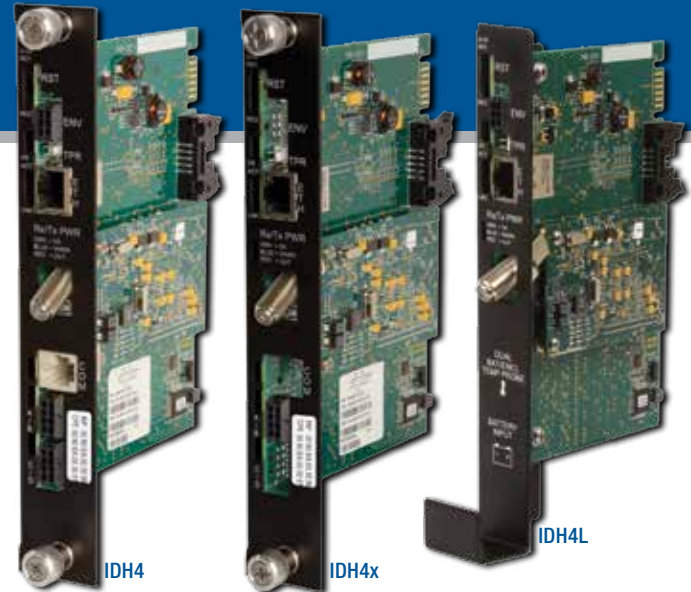
| Additional Equipment                          |  |
|---|--|
| <b>XP-BSC-3-6:</b>                            | Wire Kit, Battery Sense, 1x36V, 6'   |
| <b>XP-BSC-6-6:</b>                            | Wire Kit, Battery Sense, 2x36V, 6'   |
| <b>XP-BSC-4-6:</b>                            | Wire Kit, Battery Sense, 1x48V, 6'   |
| <b>Surge Arrestor (Alpha P/N 162-028-10):</b> | Female/Female connector configuration, "F" Type connector with integral ground block required for all installations. |

<sup>1</sup> Advanced diagnostics are available through Alpha certified network monitoring systems.

# AlphaNet™ IDH4

DOCSIS® Status Monitor for XM2, GMX & VMX

- Embedded network management for Alpha broadband power supplies
- Standard network interface Web access and SNMP ANSI/SCTE HMS MIBs
- Integrated network diagnostics tools
- **Three models available:** IDH4 (standard), IDH4x (advanced) and IDH4L (XM2-300HP)



| Specifications                        |  |
|---------------------------------------|--|
| <b>Power Supply Models Supported:</b> | <b>IDH4:</b> XM2-HP, XM2, GXM, VMX, <b>IDH4x:</b> XM2-HP, XM2, GXM, VMX, <b>IDH4L:</b> XM2-300HP   |
| <b>Battery Monitoring:</b>            | <b>IDH4:</b> Up to two strings of 36 or 48V batteries (6V batteries configurable up to two strings), <b>IDH4x:</b> Up to four strings of 36 or 48V batteries (6V batteries configurable up to four strings), <b>IDH4L:</b> One 12V battery (or two if AlphaCell Batteries) |
| <b>Power System Management:</b>       | <b>IDH4:</b> N/A, <b>IDH4x:</b> Up to five power supplies and an AlphaGen generator are managed from a single IDH4x including coordinated battery charging, system test and aggregated alarms, <b>IDH4L:</b> N/A   |
| <b>Management Protocol:</b>           | Standard ANSI/SCTE-HMS MIBs support basic power supply monitoring. Advanced diagnostics with battery and power module analytics available via secure SNMP  |

| Advanced Diagnostics <sup>1</sup>          |   |
|--|---|
| <b>Intelligent Power Supply Interface:</b> | Power supply user interface displays advanced diagnostics including: DOCSIS modem upstream and downstream RF levels, IP address assigned by network DHCP server, MAC address and firmware versions, individual battery voltages to verify correct wire harness installation |
| <b>Power Inverter State of Health:</b>     | Power Supply internal diagnostics report if the power inverter requires service.<br><b>Reported Values:</b> Inverter OK, Replace Inverter   |

| Hardware                                   |   |
|--|---|
| <b>RF Cable Interface:</b>                 | F-connector, female, 75 Ohm, connector angle accommodates coax bend radius when installed in some enclosures  |
| <b>Local Interface:</b>                    | RJ-45, Ethernet, 10/100Mbps   |
| <b>LED Indicators:</b>                     | Ready/Alarm, Upstream registration, Downstream lock, AlphaBus activity, RF level, Ethernet Link, CPE traffic, Battery Sense harness correctly connected |
| <b>I/O Control (IDH4x and IDH4L Only):</b> | <b>6-pin Molex:</b> Digital input, Digital output, 5V, Common   |
| <b>AlphaBus:</b>                           | <b>RJ-11 offset tab:</b> Multi-power supply and AlphaGen communications   |
| <b>Battery Monitoring:</b>                 | <b>IDH4:</b> 8-pin Molex battery string A/B, <b>IDH4x:</b> 8-pin Molex battery string A/B and 8-pin Molex battery string C/D, <b>IDH4L:</b> N/A         |
| <b>Tamper:</b>                             | NO or NC, software configurable, reads enclosure door magnetic switch   |

| Environment                   |  |
|-------------------------------|--|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F   |
| <b>Storage Temperature:</b>   | -40 to 85°C / -40 to 185°F   |
| <b>Humidity:</b>              | 10 to 90% non-condensing   |
| <b>Regulatory Compliance:</b> | FCC Part 15 Class A, EN 50083-2:2006 EMC requirements for CATV equipment, EN 62040-2:2006 Uninterruptible power supply EMC requirements, Category C2<br><b>Surge:</b> IEEE 587, Category B3, <b>RoHS:</b> Directive 2002/95/EC |

| Power Supply Monitored Parameters |   |
|-----------------------------------|---|
| <b>Major Alarm:</b>               | Aggregate alarm consisting of: test fail, battery fail, line isolation alarm, output overload, inverter, over-temperature, N+1 active, fuse fail  |
| <b>Minor Alarm:</b>               | Aggregate alarm consisting of: temperature probe error, AC line loss, N+1 error   |
| <b>Input Voltage:</b>             | Reported from power supply V(in) measurement  |
| <b>Output Voltage:</b>            | Reported from power supply V(out) measurement   |
| <b>Output Current:</b>            | <b>IDH4 and IDH4x:</b> 0 to 25A standard on Port 1. Port 2-4 requires power supply option. <b>IDH4L:</b> Dual outputs not to exceed 300 Watts; combined 3.5A at 90VAC output voltage, 5A at 60VAC output voltage  |
| <b>Output Power:</b>              | Calculated, reported in AC Watts  |
| <b>UPS Status:</b>                | AC Line, Standby, Test in progress, Test alarm  |
| <b>Enclosure Door:</b>            | Open or Closed  |
| <b>Battery Voltage:</b>           | <b>IDH4:</b> Individual battery voltage, up to two strings of 3 or 4 batteries (maximum 8 batteries), ±100mV per battery. <b>IDH4x:</b> Individual battery voltage, up to four strings of 3 or 4 batteries (maximum 16 batteries), ±100mV per battery. <b>IDH4L:</b> Individual battery voltage |
| <b>Battery Temperature:</b>       | Reported from power supply battery Remote Temperature Sensor (RTS)  |
| <b>Remote Test Control:</b>       | Start/Stop power supply test cycle  |

| Network Communications             |  |
|------------------------------------|--|
| <b>DOCSIS (RF) Port Protocols:</b> | IP, UDP, TCP, DHCP, TFTP, SNMPv1, SNMPv2c, HTTP, SNTp  |
| <b>Ethernet Port:</b>              | <b>Local Mode:</b> HTTP web interface for local onsite diagnosis<br><b>CPE Mode:</b> DOCSIS Cable modem Ethernet CPE functionality                                     |
| <b>MIBs:</b>                       | Power supply (ANSI/SCTE 38-4), Other SCTE HMS MIBs as defined by the SCTE for power supply and generator status monitoring, Alpha proprietary advanced UPS diagnostics |

| Generator Monitored Parameters (IDH4x Only) |   |
|---|---|
| <b>Status:</b>                              | Generator Off, Running, Alarm   |
| <b>Generator Alarm:</b>                     | <b>Aggregate alarm consisting of:</b> low oil pressure, engine over-temp, engine over-speed, crank limit, over voltage, low fuel, water intrusion, pad shear, gas hazard, test fail |
| <b>Gas Hazard:</b>                          | OK, Alarm   |
| <b>Water Intrusion:</b>                     | OK, Alarm   |
| <b>Pad Shear:</b>                           | OK, Alarm   |
| <b>Enclosure Door:</b>                      | Open, Alarm   |
| <b>Ignition Battery Voltage:</b>            | ±100mV  |
| <b>Enclosure Temperature:</b>               | ±2°C  |
| <b>Low Fuel:</b>                            | OK, Alarm   |
| <b>Remote Test Control:</b>                 | Start/Stop generator test cycle   |

| Cable Modem for DOCSIS 1.1 and 2.0     |  |
|--|--|
| <b>Transmit Frequency Range:</b>       | 5 to 42MHz   |
| <b>Receive Center Frequency Range:</b> | 91 to 857MHz   |
| <b>Output Power Range:</b>             | <b>TDMA:</b><br>8 to 54dBmV (32QAM, 64QAM)<br>8 to 55dBmV (8QAM, 16QAM)<br>8 to 58dBmV (QPSK)<br><b>S-CDMA:</b><br>8 to 53dBmV (All modulations of S-CDMA) |
| <b>Input Signal Range:</b>             | -15 to 15dBmV  |
| <b>Channel Bandwidth:</b>              | 6Mhz   |

| Additional Equipment     |   |
|--------------------------|---|
| <b>874-842-21 (P/N):</b> | Wire Kit, Battery Sense, 1x36V, 6'  |
| <b>874-842-20 (P/N):</b> | Wire Kit, Battery Sense, 2x36V, 6'  |
| <b>874-841-21 (P/N):</b> | Wire Kit, Battery Sense, 1x48V, 6'  |
| <b>874-841-20 (P/N):</b> | Wire Kit, Battery Sense, 2x48V, 6'  |
| <b>162-028-10 (P/N):</b> | <b>Surge Protector:</b> Female/Female connector configuration, "F" type connector with integral ground block required for all installations |

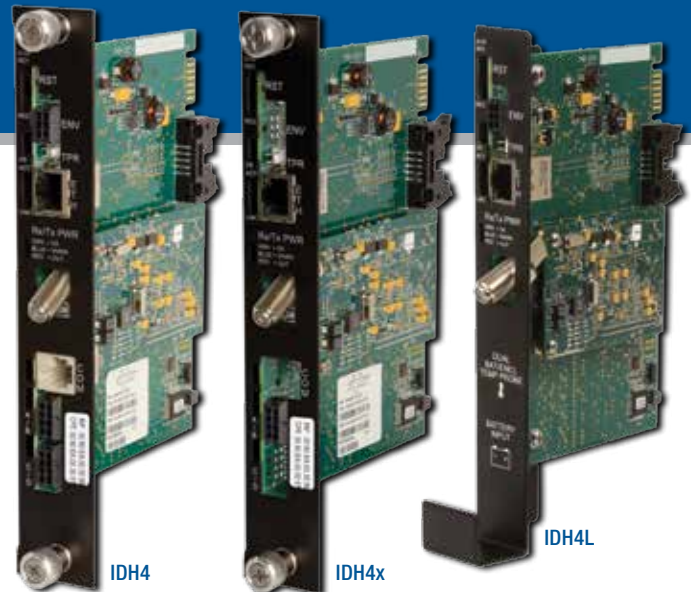
<sup>1</sup> Advanced diagnostics are available through Alpha Certified network monitoring systems.



# AlphaNet™ IDH4

## DOCSIS® Status Monitor for XM3-HP

- Embedded network management for Alpha broadband power supplies
- Standard network interface Web access and SNMP ANSI/SCTE HMS MIBs
- Integrated network diagnostics tools
- **Three models available:** IDH4 (standard), IDH4x (advanced) and IDH4L (used with AlphaGuard option)



| Specifications                        |  |
|---------------------------------------|--|
| <b>Power Supply Models Supported:</b> | XM3-HP   |
| <b>Battery Monitoring:</b>            | <b>IDH4:</b> Up to two strings of 36 or 48V batteries (6V batteries configurable up to two strings), <b>IDH4x:</b> Up to four strings of 36 or 48V batteries (6V batteries configurable up to four strings), <b>IDH4L:</b> One 12V battery (or two if AlphaCell Batteries) |
| <b>Power System Management:</b>       | <b>IDH4:</b> N/A, <b>IDH4x:</b> Up to five power supplies and an AlphaGen generator are managed from a single IDH4x including coordinated battery charging, system test and aggregated alarms, <b>IDH4L:</b> N/A   |
| <b>Management Protocol:</b>           | Standard ANSI/SCTE-HMS MIBs support basic power supply monitoring. Advanced diagnostics with battery and power module analytics available via secure SNMP  |

| Advanced Diagnostics <sup>1</sup>                             |  |
|---|--|
| <b>Intelligent Power Supply Interface:</b>                    | <b>Power supply user interface displays advanced diagnostics including:</b> DOCSIS modem upstream and downstream RF levels, IP address assigned by network DHCP server, MAC address and firmware levels  |
| <b>Battery State of Health (Requires AlphaApps Option):</b>   | Power supply internal analytic diagnostics report when batteries should be serviced. <ul style="list-style-type: none"> <li>• Battery String Runtime Remaining</li> <li>• Battery Life Remaining</li> </ul>  |
| <b>Utility Status and Events (Requires AlphaApps Option):</b> | <b>AC Line Status:</b> <ul style="list-style-type: none"> <li>• Utility Performance Status (outages, sags, surges, frequency)</li> <li>• Utility Events (24-hour and lifetime number of events)</li> </ul>   |
| <b>History Log Reports:</b>                                   | <ul style="list-style-type: none"> <li>• Power Supply Event Log (events of daily power supply operation)</li> <li>• Power Supply Configuration Log (events that occur infrequently)</li> <li>• Battery Event Log (battery conductance measurement and battery manufactured dates)</li> </ul> |

| Hardware                                   |   |
|--|---|
| <b>RF Cable Interface:</b>                 | F-connector, female, 75 Ohm, connector angle accommodates coax bend radius when installed in some enclosures  |
| <b>Local Interface:</b>                    | RJ-45, Ethernet, 10/100Mbps   |
| <b>LED Indicators:</b>                     | Ready/Alarm, Upstream registration, Downstream lock, AlphaBus activity, RF level, Ethernet Link, CPE traffic, Battery Sense harness correctly connected |
| <b>I/O Control (IDH4x and IDH4L Only):</b> | <b>6-pin Molex:</b> Digital input, Digital output, 5V, Common   |
| <b>AlphaBus:</b>                           | <b>RJ-11 offset tab:</b> Multi-power supply and AlphaGen communications   |
| <b>Battery Monitoring:</b>                 | <b>IDH4:</b> 8-pin Molex battery string A/B, <b>IDH4x:</b> 8-pin Molex battery string A/B and 8-pin Molex battery string C/D, <b>IDH4L:</b> N/A         |
| <b>Tamper:</b>                             | NO or NC, software configurable, reads enclosure door magnetic switch   |

| Environment                   |   |
|-------------------------------|---|
| <b>Operating Temperature:</b> | -40 to 65°C / -40 to 149°F  |
| <b>Storage Temperature:</b>   | -40 to 85°C / -40 to 185°F  |
| <b>Humidity:</b>              | 10 to 90% non-condensing  |
| <b>Regulatory Compliance:</b> | FCC Part 15 Class A, EN 50083-2:2006 EMC requirements for CATV equipment, EN 62040-2:2006 Uninterruptible power supply EMC requirements, Category C2 Surge: IEEE 587, Category B3, RoHS: Directive 2002/95/EC |

| Generator Monitored Parameters (IDH4x Only) |   |
|---|---|
| <b>Status:</b>                              | Generator Off, Running, Alarm   |
| <b>Generator Alarm:</b>                     | <b>Aggregate alarm consisting of:</b> low oil pressure, engine over-temp, engine over-speed, crank limit, over voltage, low fuel, water intrusion, pad shear, gas hazard, test fail |
| <b>Gas Hazard:</b>                          | OK, Alarm   |
| <b>Water Intrusion:</b>                     | OK, Alarm   |
| <b>Pad Shear:</b>                           | OK, Alarm   |
| <b>Enclosure Door:</b>                      | Open, Alarm   |
| <b>Ignition Battery Voltage:</b>            | ±100mV  |
| <b>Enclosure Temperature:</b>               | ±2°C  |
| <b>Low Fuel:</b>                            | OK, Alarm   |
| <b>Remote Test Control:</b>                 | Start/Stop generator test cycle   |

| Power Supply Monitored Parameters |   |
|-----------------------------------|---|
| <b>Major Alarm:</b>               | <b>Aggregate alarm consisting of:</b> test fail, line isolation, output failure, output overload, output tripped, charger failure, inverter temperature, configuration error, inverter failure, no batteries, battery failure   |
| <b>Minor Alarm:</b>               | <b>Aggregate alarm consisting of:</b> AC line loss, input over current/input current limit, surge MOV failure, inverter enable, charger enable, option board failure, battery temperature probe   |
| <b>Input Voltage:</b>             | Reported from power supply V(in) measurement  |
| <b>Output Voltage:</b>            | Reported from power supply V(out) measurement   |
| <b>Input Current:</b>             | Reported in Amps  |
| <b>Output Current:</b>            | 0 to 25A standard on port 1, Port 2 requires power supply option  |
| <b>Input Power:</b>               | Reported in AC Watts  |
| <b>Output Power:</b>              | Calculated, reported in AC Watts  |
| <b>UPS Status:</b>                | AC Line, Standby, Test in progress, Test alarm  |
| <b>Charger Current:</b>           | Reported in Amps  |
| <b>Battery Discharge Current:</b> | Reported in Amps  |
| <b>Battery Voltage:</b>           | <b>IDH4:</b> Individual battery voltage, up to two strings of 3 or 4 batteries (maximum 8 batteries), ±100mV per battery, <b>IDH4x:</b> Individual battery voltage, up to four strings of 3 or 4 batteries (maximum 16 batteries), ±100mV per battery, <b>IDH4L:</b> Individual battery voltage, up to four strings of 3 or 4 batteries (maximum 16 batteries), ±100mV per battery. Requires SAG option |
| <b>Battery Temperature:</b>       | Reported from power supply battery Remote Temperature Sensor (RTS)  |
| <b>Remote Test Control:</b>       | Start/Stop power supply test cycle  |
| <b>Enclosure Door:</b>            | Open or Closed  |

| Network Communications             |  |
|------------------------------------|--|
| <b>DOCSIS (RF) Port Protocols:</b> | IP, UDP, TCP, DHCP, TFTP, SNMPv1, SNMPv2c, HTTP, SNMP  |
| <b>Ethernet Port:</b>              | <b>Local Mode:</b> HTTP web interface for local onsite diagnosis<br><b>CPE Mode:</b> DOCSIS Cable modem Ethernet CPE functionality                                     |
| <b>MIBs:</b>                       | Power supply (ANSI/SCTE 38-4), Other SCTE HMS MIBs as defined by the SCTE for power supply and generator status monitoring, Alpha proprietary advanced UPS diagnostics |

| Cable Modem for DOCSIS 1.1 and 2.0     |  |
|--|--|
| <b>Transmit Frequency Range:</b>       | 5 to 42Mhz   |
| <b>Receive Center Frequency Range:</b> | 91 to 857Mhz   |
| <b>Output Power Range:</b>             | <b>TDMA:</b><br>8 to 54dBmV (32QAM, 64QAM)<br>8 to 55dBmV (8QAM, 16QAM)<br>8 to 58dBmV (QPSK)<br><b>S-CDMA:</b><br>8 to 53dBmV (All modulations of S-CDMA) |
| <b>Input Signal Range:</b>             | -15 to 15dBmV  |
| <b>Channel Bandwidth:</b>              | 6Mhz   |

| Additional Equipment     |  |
|--------------------------|--|
| <b>874-842-21 (P/N):</b> | Wire Kit, Battery Sense, 1x36V, 6'   |
| <b>874-842-20 (P/N):</b> | Wire Kit, Battery Sense, 2x36V, 6'   |
| <b>874-841-21 (P/N):</b> | Wire Kit, Battery Sense, 1x48V, 6'   |
| <b>874-841-20 (P/N):</b> | Wire Kit, Battery Sense, 2x48V, 6'   |
| <b>162-028-10 (P/N):</b> | <b>Surge Protector:</b> Female/Female connector configuration, "F" type connector with integralf ground block required for all installations |

<sup>1</sup> Advanced diagnostics are available through Alpha certified network monitoring systems.

# Continuity Software

## DOCSIS® Power Supply Monitoring

- Enterprise-class, web-enabled and standard-based
- Centralized transponder provisioning and inventory
- Scheduled standby tests for preventative maintenance
- Standby event dashboards



### ➤ Enterprise-Class Software

Web-enabled and standard-based Continuity-SPS (Standby Power Supply) is a flexible, standby power supply status monitoring solution. Based on HMS and DOCSIS standards, Continuity-SPS supports any standards-based transponder, providing cable operators with an enterprise-class, centralized, feature-rich, web-enabled tool to monitor all the standby power supplies in the network.

### ➤ Centralized Transponder Provisioning and Inventory

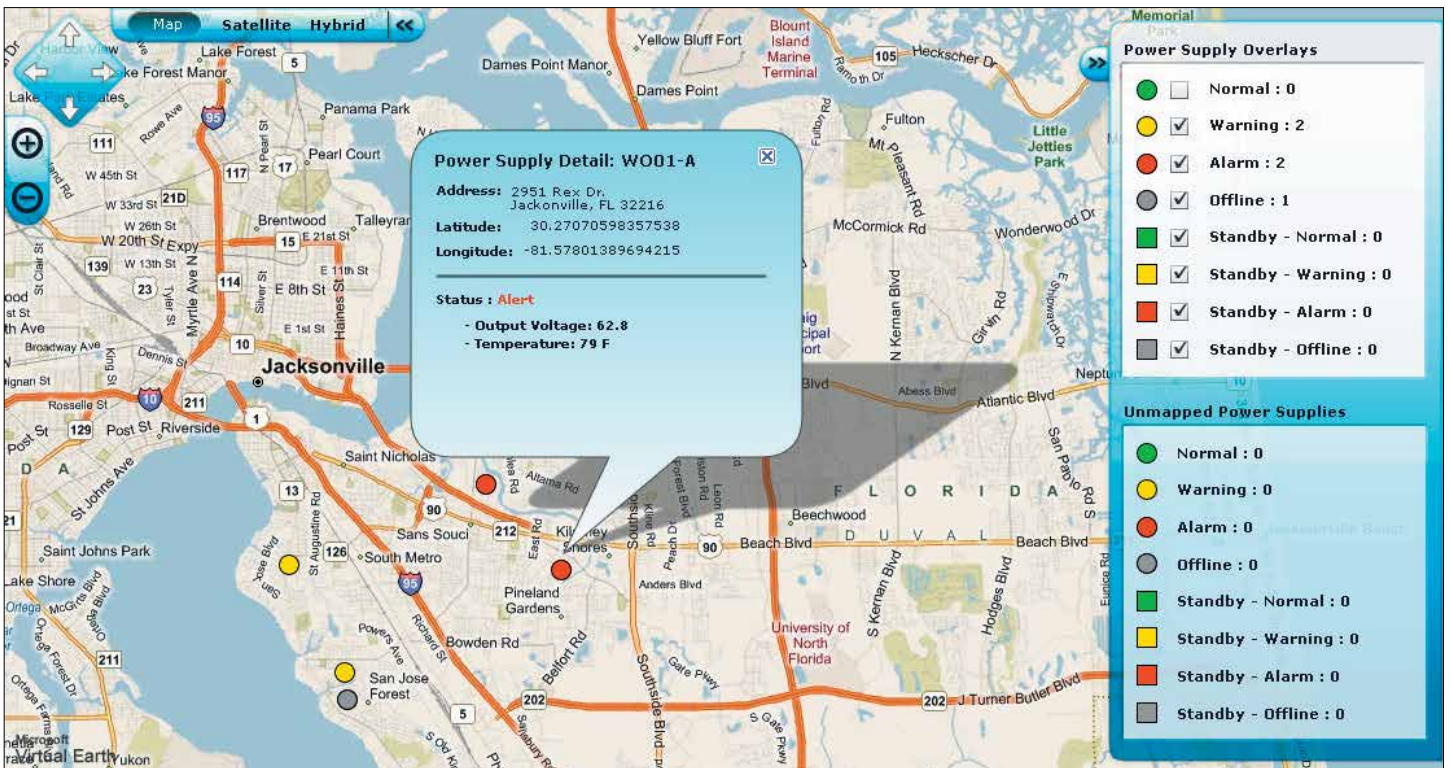
With Continuity-SPS you can automatically discover and provision all transponders from one central location. Continuity-SPS also includes an up-to-date inventory of all transponders that can be exported into Excel or CSV.

### ➤ Scheduled Standby Tests Allow for Preventative Maintenance

Continuity-SPS allows you to proactively schedule standby tests, which will alarm on risk areas on the network. A dashboard graphically updates individual battery voltages from standby tests every minute, making it easy to identify questionable batteries. These batteries can be replaced during scheduled maintenance visits before they turn the next standby event into an outage.

### ➤ Standby Event Dashboard

Continuity-SPS shows all current, standby events in an easy-to-read dashboard. For each event, the standby event dashboard displays summaries of past standby events and shows real-time battery voltages. The standby event dashboard provides a powerful view into the network during a power outage.



# Node Power System

Rack, Pole, Wall or Floor Mount Options

- For low power applications including Fiber Deep up to Node + 6 actives
- Optional AlphaGuard™ battery balancer and SPI-RF service power inserter
- Multiple battery configurations for extended runtime

The Node Power Supply (NPS) enclosure is an integrated CableUPS® system for use in Multi Dwelling Units (MDU), business parks, node segmentation and plant extension applications. The NPS is specifically designed for indoor or outdoor installations requiring lower power, a smaller footprint and embedded DOCSIS® or proprietary status monitoring capability. The NPS can be conveniently mounted in an equipment rack, a wall, pole, or to a floor pedestal using the appropriate installation kit. The NPS is an ideal solution for back-up power where traditional equipment is too large and bulky.



## CableUPS®



- Enclosure fits XM2-906HP and XM2-300HP Industry leading highest efficiency for lower operating costs
- Featuring iM™ Intelligent Inverter Module for XM2-HP and XM2 Platforms
- Displays Critical Smart DOCSIS parameters and individual battery voltages
- Sharper easy-to-read blue LCD Smart Display

## AlphaGuard™



- Extends battery life
- Spreads charge voltage equally across batteries
- Compensates for battery differences as they age
- Identify and replace single suspect batteries, not the entire string
- Single battery connections for charge management and status monitoring

## SPI-RF



- Single network interconnect carrying system power and DOCSIS RF monitoring signals
- RF level control with SXP PAD
- FRT shielded cast aluminum package

## Batteries



- Deliver 100% "out-of-box" capacity—no cycling required
- Premium Gel model offers 50% longer life than traditional gel batteries
- Silver Alloy minimizes grid corrosion
- Maintenance-free threaded inserts; no periodic retorquing

## Enclosure Cooling Fan (ECF) Systems



- Enclosure Cooling Fan enhances air circulation in an enclosure's battery compartment
- Air flow eliminates "hotspot" premature battery failures in hotter climates
- Significantly reduces the power supply compartment temperature



- Front terminal design with protective covers
- High cyclic life capability
- Flame retardant case and cover (to UL94V0)
- 3-step terminal seal design ensures leak-free operation
- Integral handles (115HPL-FT, 220HPL-FT) for ease of handling

# PWE Enclosure

Outdoor Pole Mount Enclosures

- Engineered for broadband powering applications
- Aluminum welded construction and durable powdercoated exterior
- Agency certified to meet applicable industry standards
- Internal or external SUSE rated service entrance options
- Optional Battery Integration Tray (BIT)
- Portable generator cabling access door
- Optional northern enclosure available for colder climates



PWE-3

| Models:                         | PWE-3                                 | PWE-3<br>(Northern Enclosure)           | PWE-4                                 | PWE-6                                 | PWE-6<br>(Northern Enclosure)           |
|---------------------------------|---------------------------------------|---|---------------------------------------|---------------------------------------|---|
| <b>Mechanical</b>               |                                       |   |                                       |                                       |   |
| Dimensions H x W x D (in/mm):   | 24.5 x 24.3 x 14 /<br>622 x 615 x 355 | 25.4 x 24.8 x 14.1 /<br>645 x 628 x 359 | 24.8 x 30.3 x 16 /<br>629 x 768 x 406 | 36.8 x 24.3 x 14 /<br>933 x 615 x 355 | 37.7 x 24.8 x 14.1 /<br>958 x 628 x 359 |
| Weight w/out Batteries (lb/kg): | 39 / 18                               | 42 / 19.1                               | 57 / 26                               | 68 / 31                               | 73 / 33.1                               |
| PWE Enclosure Configurations:   |                                       |   |                                       |                                       |   |

| Models Continued:               | PWE-6FT                                 | PWE-8                                 | PWE-9                                | PWE-D36                              |
|---------------------------------|---|---------------------------------------|--------------------------------------|--------------------------------------|
| <b>Mechanical</b>               |   |                                       |                                      |                                      |
| Dimensions H x W x D (in/mm):   | 27.5 x 29.3 x 17.5 /<br>698 x 753 x 445 | 36.9 x 30.3 x 16 /<br>937 x 768 x 406 | 47 x 24.3 x 14 /<br>1194 x 615 x 355 | 47 x 24.3 x 14 /<br>1194 x 615 x 355 |
| Weight w/out Batteries (lb/kg): | 57 / 26                                 | 121 / 55                              | 85 / 38.5                            | 75 / 34                              |
| PWE Enclosure Configurations:   |   |                                       |                                      |                                      |

| Specifications     |   |
|--------------------|---|
| Material:          | Exterior powdercoated aluminum  |
| Door and Lid Seal: | Poron gasketing   |
| Color:             | Gray (custom colors available)  |
| Lid:               | Removable   |
| Door:              | Hinged removable  |
| Pole Mount:        | Galvanized steel brackets for wood and concrete pole mount and wall mount |
| Tamper Switch:     | Optional  |
| Battery Side Tray: | Optional  |

**Northern Enclosure Hood and Door for Colder Climates**

Northern Enclosures feature Z-bracket, vented hood and doors with no batting required.

# UPE & UPE-M Enclosures

Outdoor Ground Mount Enclosures



UPE-8

- Engineered to accommodate broadband powering applications
- Internal or external SUSE rated service entrance options available
- Enclosures are CSA/UL certified to meet applicable industry standards
- Aluminum-welded construction and durable powdercoated exterior
- Portable generator cabling access door
- Multiple enclosure accessories and options available

| UPE Models (Non-Metered)               | UPE-3                               | UPE-4                               | UPE-6                              | UPE-6L                            | UPE-8                                  |
|--|-------------------------------------|-------------------------------------|------------------------------------|-----------------------------------|--|
| <b>Mechanical</b>                      |                                     |                                     |                                    |                                   |  |
| <b>Dimensions H x W x D (in/mm):</b>   | 33.5 x 26 x 15 /<br>851 x 660 x 381 | 35 x 34.5 x 15 /<br>889 x 876 x 381 | 48 x 26 x 15 /<br>1219 x 660 x 381 | 36 x 26 x 15 /<br>914 x 882 x 381 | 45.5 x 34.5 x 15 /<br>1136 x 882 x 381 |
| <b>Weight w/out Batteries (lb/kg):</b> | 61 / 28                             | 72 / 32                             | 75 / 34                            | 68 / 30                           | 121 / 55                               |
| <b>UPE Configurations:</b>             |                                     |                                     |                                    |                                   |  |

| UPE-M Models (Metered)                 | UPE-M3                            | UPE-M6                              | UPE-M8                            |
|--|-----------------------------------|-------------------------------------|-----------------------------------|
| <b>Mechanical</b>                      |                                   |                                     |                                   |
| <b>Dimensions H x W x D (in/mm):</b>   | 45 x 26 x 19.7 / 1143 x 660 x 482 | 57.3 x 26 x 19.7 / 1455 x 660 x 482 | 50 x 32 x 20.5 / 1270 x 813 x 521 |
| <b>Weight w/out Batteries (lb/kg):</b> | 100 / 44                          | 130 / 59                            | 140 / 64                          |
| <b>UPE-M Configurations:</b>           |                                   |                                     |                                   |

| Specifications            |   |
|---------------------------|---|
| <b>Material:</b>          | Exterior powdercoated aluminum          |
| <b>Door and Lid Seal:</b> | Poron gasketing                         |
| <b>Color:</b>             | Gray (custom colors available)          |
| <b>Lid:</b>               | Removable                               |
| <b>Door:</b>              | Removable/lockable                      |
| <b>Ground Mount:</b>      | Precast polymer concrete pad (optional) |
| <b>Tamper Switch:</b>     | Optional                                |
| <b>Battery Side Tray:</b> | Optional                                |

# LPE Enclosure

## Indoor/Outdoor Enclosure

- Wall mount, pole mount and ground mounting options
- 40% smaller than industry standard PWE-3 system
- Innovative thermal management airflow system



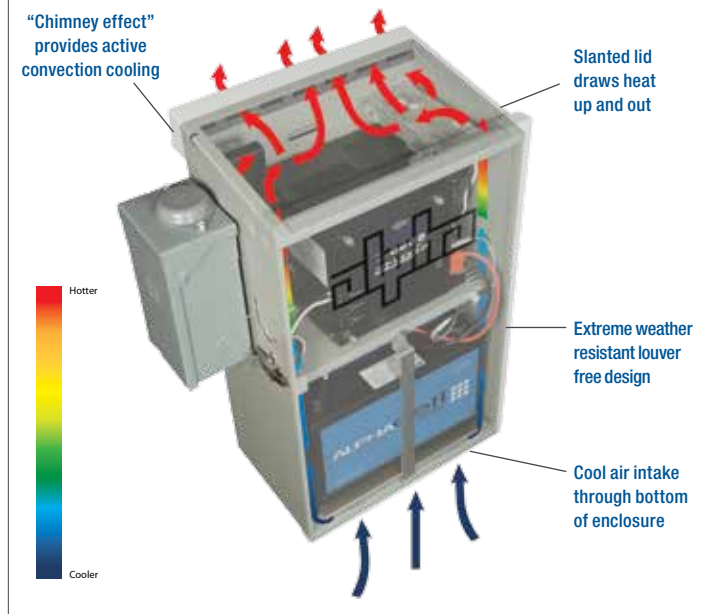
| Mechanical                    |                                  |
|-------------------------------|----------------------------------|
| Dimensions H x W x D (in/mm): | 26 x 16.5 x 12 / 661 x 420 x 305 |
| Weight (lb/kg):               | 25 / 11.3                        |
| Material:                     | Exterior powdercoated aluminum   |
| Battery:                      | 220GXL or two 70HPL-FTs          |
| Door and Lid Seal:            | Poron gasketing                  |
| Color:                        | Gray (custom colors available)   |
| Lid:                          | Removable                        |
| Door:                         | Hinged, removable                |

| Options                      |   |
|------------------------------|---|
| Mounting Hardware:           | Pole mount bracket, wall mount bracket, ground mount bracket  |
| Battery Heater Mat:          | Used in cold-climate applications   |
| Battery Retaining Bar (BRB): | Secures batteries within enclosure  |
| Coax Connection:             | SPI or SPI-RF   |
| Door Locks:                  | Optional GEM lock   |
| Lightning Arrester:          | LA-P+ 120V, LA-P-120T, Surge Arrester Kit   |
| Service Entrance:            | 70A available   |
| Status Indicators:           | Local/Remote Indicator (LRI)  |
| Coax Surge Protection:       | <ul style="list-style-type: none"> <li>• 75 Ω Coax, MF</li> <li>• 75 Ω Coax, FF w/Gnd</li> <li>• 75 Ω Coax, FF</li> </ul> |

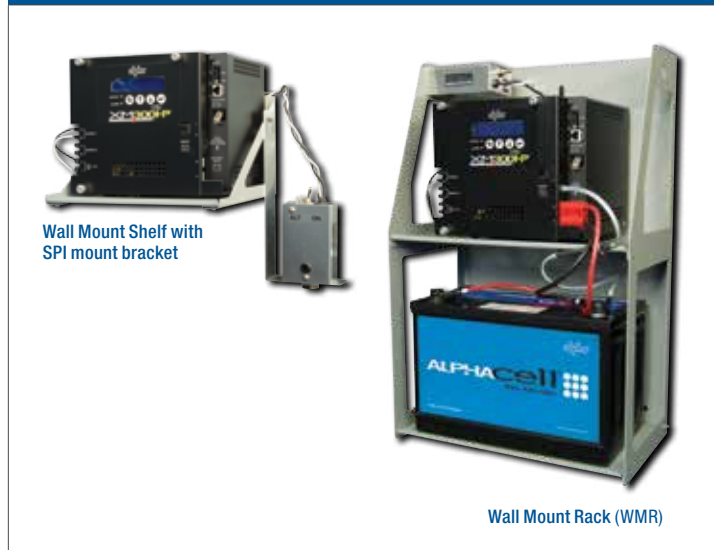
### Smallest Available Footprint



### Innovative Convective Airflow System



### Other Cost Effective Indoor Wall Mount Options



# HSHP Enclosure

High Security High Performance Enclosure



- All-in-one maximum security enclosure
- Internal and external security provisions to prevent against unauthorized entry
- Flush surface design and concealed hinges limit pry points
- Added security options for exclusive senior management dual-key access

## Internal Battery Security Bar



Internal security bar locks the batteries inside the enclosure. Exclusive Alpha security screws are required to attach the bar to the shelf and the bottom hooks into the internal base plate.

## Concealed Hinges



Enclosure features concealed hinges prohibiting any external access. The internal hinges are equipped with a release pin to remove the door when servicing.

## High Security Latch Key Locks



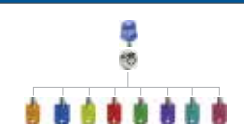
Equipped with internal lock latches that hook directly into the enclosure to protect from access to prying.

## Custom Keyed Security Bolt



An Alpha exclusive security screw is provided to lock the power supply directly to the cabinet itself. This feature adds senior management dual-key access.

## Optional Mul-T-Locks



Optional 8-in-1 changeable combination cylinder for maximum protection

## Weldable Tabs



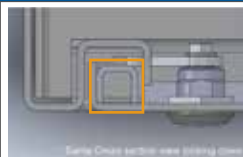
Optional tabs can be added to the top and bottom of the door which can be welded closed. A grinder is required to remove the tabs.

## Recessed Door Design



The enclosure's constructed with a recessed door to limit prying points. Attempts to pry will cause the until to lock up the door frame.

## Reinforced Door Design



The enclosure door is reinforced with an internal U-Channel frame around the entire perimeter of the door. When door is closed, the internal U-Channel is locked between the enclosure and the door.

## Enhanced Lid



The lid is security bolted to the enclosure and nested to the enclosure to enhance overall strength of the enclosure and limit pry points.

# Security Accessories

Optional Accessories for Enclosure Security



PWE High Security Device

- External security options available to prevent unauthorized entry and serve as theft deterrent
- Internal security solutions to protect costly power system components
- Multiple security options available to maximize power system investment

## PWE High Security Device



- High visibility theft deterrent
- Stainless steel construction—corrosion resistant
- Locking system prevents access to padlock shackle (to prevent cutting of lock)

## Ground Mount Security Bar For UPE / UPE-M / PN Enclosures



- High visibility theft deterrent
- Powdercoated, corrosion resistant
- Locking system prevents access to padlock shackle (to prevent cutting of lock)

## AlphaCell® Anti-Theft Label



- Destructible vinyl—made to fracture if tampered with. Will not easily peel off.
- Temperature and chemical resistant
- Large, identifiable size (4x6")
- Customizable with logo

## DeWalt MobileLock



- Nationwide GPS Locator with anti-theft controls
- Customizable alarm sensors (vibration, tamper, temperature)
- Long life battery (up to 1 month)
- Mobile alert via email or cell phone

## Tamper Switch



This magnetic door switch provides an intrusion alarm through remote status monitoring and may be ordered with normally-closed or normally-open contacts.

## Power Supply Hold-Down Bracket



This security device consists of a metal framework wrap that secures the power supply in place, guarding against theft, vandalism and movement during natural disasters or other extreme conditions such as traffic accidents.

## Battery Security Device



This custom-fitted framework secures the batteries in the equipment enclosure. A hinged, double-wall reinforced cross beam with enclosed padlock housing locks the batteries in place, while still allowing access by service personnel for maintenance. Heavy-duty design and powder-coated steel construction provide the appropriate level of security to system batteries.

## Security Bar Kit



Alpha's enclosure security bar prevents unauthorized access to pole-mount power system enclosures. It also helps secure enclosure contents during unforeseen emergency or natural disaster situations. Heavy-duty reinforced steel construction and swing-away hinged design strike the right balance between protection and serviceability. An enclosed padlock housing further protects the enclosure from unauthorized access.

## Safety Padlock



This hardened steel, corrosion-resistant, thin-profile padlock is a critical element in preventing unauthorized access while still allowing keyed entry to secured areas. Additionally, restricted keyways, customer-specific key codes and exclusive key blanks allow operators to establish a comprehensive keying strategy. It is an excellent addition to other Alpha security accessories as its size and thin-profile design fit within the enclosed padlock housings.



# Enclosure Accessories

Optional Accessories for Enclosures

- Retrofit existing enclosures
- Easy installation and maintenance
- Cooling options extend battery and power supply life
- Heating options for maximum protection

## Enclosure Cooling Fan (ECF) Systems



PWE/UPE series

- The enclosure cooling fan enhances air circulation in an enclosure's battery compartment
- Air flow eliminates "hotspot" premature battery failures in hotter climates
- Significantly reduces the power supply compartment temperature
- Calculated Mean Time Between Failure (MTBF) studies indicate this will extend power supply life by two years



PowerNode series

## Battery Spacer Clip (BSC)



- Designed for use with most group 27 or 31 VRLA batteries
- Easy installation—clips to the top of the battery
- Increases battery life expectancy by providing critical battery spacing required for proper ventilation
- Accurately positions and secures the Remote Temperature Sensor (RTS)
- Strongly recommended for hot climates
- Designed to last over 30 years or lifetime of the equipment

## Battery Retaining Bar



- Provides added security against the batteries from falling out or being thrown from an enclosure
- Easily snaps into place

## Module Retaining Cable



- Prevents power supply from sliding off the shelf or being thrown from a PWE enclosure
- Bolted to enclosure and clips to handle of supply
- Constructed of braided steel cable and carabiner style clips

## Battery Integration Tray (BIT)



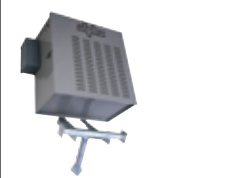
- Factory installed option in any new PWE-3/6 and UPE-3/6 enclosures
- Eliminates battery cable kits and slide trays
- Greatly reduces battery preventative maintenance
- Pre-wired voltage sense leads for transponder and AlphaGuard
- Allows for the direct connection of generator

## Battery Heater Mat



- Consumes 30% less power than previous designs
- Durable polyester construction and insulated design
- Sealed on-mat electronics for maximum protection
- On-mat thermal switch and thermal fuse for redundant safety
- Piggyback plug standard on 120V models

## Ladder Bracket



- Provides safe access for servicing power supplies and batteries without a bucket truck
- Attaches to PWE enclosures; does not require a pole attachment point
- Heavy-duty galvanized steel construction
- Includes a safety belt attachment location accepting strand hook ladders less than 20" in width

# Powernode Systems

## Extended Runtime Powering

- Configurable to support centralized or distributed powering architectures
- Compatible with AlphaGen™ generator systems or multiple battery strings for extended runtime solutions
- SUSE and EUSERC rated options available
- CSA/UL certified to meet applicable industry standards
- High security lock option



PN-3 with AlphaGen

| PN-3 Specifications                  |  |
|--------------------------------------|--|
| <b>Dimensions H x W x D (in/mm):</b> | 44 x 26 x 24 / 1118 x 660 x 610          |
| <b>Weight w/out Trays (lb/kg):</b>   | 115 / 52                                 |
| <b>Power Supply Capacity:</b>        | Up to two power supplies                 |
| <b>Color:</b>                        | Seafoam green, optional colors available |
| <b>Standard Features:</b>            | Removable / lockable doors               |
| <b>Finish:</b>                       | Durable powdercoat exterior              |
| <b>Material:</b>                     | Aluminum                                 |

| Single PN-3  | Dual PN-3                             | PN-3/CE-3X2   |
|--|---------------------------------------|---|
|  |                                       |   |
| 1 Power Supply<br>2 Battery Strings  | 2 Power Supplies<br>4 Battery Strings | 2 Power Supplies<br>1 Battery String<br>AlphaGen™ Generator |
| The PN-3 enclosure can accommodate a maximum combination of three equipment or battery trays |                                       |   |

| PN-3-HS (High Security) Specifications |  |
|--|--|
| <b>Dimensions H x W x D (in/mm):</b>   | 44 x 26 x 24 / 1118 x 660 x 610          |
| <b>Weight w/out Trays (lb/kg):</b>     | 115 / 52                                 |
| <b>Power Supply Capacity:</b>          | Up to two power supplies                 |
| <b>Color:</b>                          | Seafoam green, optional colors available |
| <b>Standard Features:</b>              | Removable/Lockable doors                 |
| <b>Finish:</b>                         | Durable powdercoat exterior              |
| <b>Material:</b>                       | Aluminum                                 |

| PN-3-HS  | PN-3/SC-HS   | PN-3/SC-HS          |
|--|--|---------------------|
|  |  |                     |
| Battery Cabinet<br>3 Battery Strings   | Sidecar and Battery Cabinet<br>1 Power Supply<br>4 Battery Strings | High Security Locks |
| The PN-3/SC-HS system has recessed star bolt security locks to prevent unauthorized entry. Reinforced door frames. Doors reinforced with welded channel for strength |  |                     |

| PN-4 Specifications                  |  |
|--------------------------------------|--|
| <b>Dimensions H x W x D (in/mm):</b> | 52 x 26 x 24 / 1320 x 660 x 610          |
| <b>Weight w/out Trays (lb/kg):</b>   | 145 / 66                                 |
| <b>Power Supply Capacity:</b>        | Up to three power supplies               |
| <b>Color:</b>                        | Seafoam green, optional colors available |
| <b>Standard Features:</b>            | Removable/Lockable doors                 |
| <b>Finish:</b>                       | Durable powdercoat exterior              |
| <b>Material:</b>                     | Aluminum                                 |

| Single PN-4  | Dual PN-4                             | PN-4/CE-9X2   |
|--|---------------------------------------|---|
|  |                                       |   |
| 2 Power Supplies<br>2 Battery Strings  | 3 Power Supplies<br>4 Battery Strings | 2 Power Supplies<br>2 Battery Strings<br>AlphaGen Generator |
| The PN-4 enclosure can accommodate a maximum combination of four trays.<br>A maximum of either three power modules or three battery trays can be installed |                                       |   |

# Surge Protection

- UL 1449 3rd Edition Approved
- Critical protection from voltage transients
- Plug-in or hardwired solution utilizing Metal Oxide Varistor (MOV) protection
- VSS 120/VSS 240 Series provides downed power line protection



LA-P-120T



LA-P+



ISA-120/240



VSS 120/VSS 240



ISA-240

## Surge Protection

| Operating Voltage                                   | 120V Models                   |                               |                               |                               | 120/240V Models               |                               |                               | 240V Models                   |  |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--|
| Model Selection                                     | Good                          | Better                        | Best                          | Best                          | Best                          | Good                          | Best                          | Best                          |  |
| <b>Series Model:</b>                                | LA-P+ 120                     | LA-P-120T                     | VSS 120-152                   | VSS 120-202                   | ISA 120/2401                  | LA-P+240                      | ISA 2401,2                    | VSS2402                       |  |
| <b>Outlet Type/Pass Thru:</b>                       | ⊕ / NO                        | ⊕ / YES                       | ⊕ / YES                       | ⊕ / YES                       | Hardwired/ NA                 | ⊕ / NO                        | Hardwired/ NA                 | ⊕ / YES                       |  |
| <b>Protection:</b>                                  | L / N / G                     | L / N / G                     | L / N / G                     | L / N / G                     | L / N / G                     | L1 / L2 / G                   | L / G                         | L1 / L2 / G                   |  |
| <b>Operating Temperature:</b>                       | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F | -40 to 55°C /<br>-40 to 131°F |  |
| <b>LED Indicator:</b>                               | Yes                           | Yes                           | Yes                           | Yes                           | Yes                           | Yes                           | Yes                           | Yes                           |  |
| <b>UL 1449 3rd Edition Specifications</b>           |                               |                               |                               |                               |                               |                               |                               |                               |  |
| <b>Voltage Let Through Protection Rating:</b>       | 700Vp                         | 500Vp                         | 500Vp                         | 500Vp                         | 700Vp / 1200Vp                | 1200Vp                        | 1200Vp                        | 500Vp                         |  |
| <b>Nominal Discharge Current Rating:</b>            | 3kA                           | 3kA                           | 20kA                          | 20kA                          | 10kA                          | 3kA                           | 10kA                          | 20kA                          |  |
| <b>Maximum Continuous Operating Voltage (MCOV):</b> | 150VAC                        | 130VAC                        | 275VAC                        | 275VAC                        | 150VAC / 300VAC               | 320VAC                        | 320VAC                        | 275VAC                        |  |

## COAX Protectors

Ideally suited to protect costly status monitoring transponders, digital set top boxes, cable modems and satellite receivers in the headend as well as high-end HDTV sets from potentially damaging surges. The patented coaxial gas tube surge protector is equipped with an integral fail-safe mechanism. Listed to UL 497, CSA Listed Certified and Complies with 1999 National Electric Code.

- Patented In-Line® coaxial gas tube surge protection
- Provide lightning and surge protection for distribution, customer premises and headend equipment
- Improves broadband network reliability and reduces service outages
- Power passing
- Listed to UL 497, CSA listed certified & complies with NEC

| Part Number | Description  |
|-------------|--|
| 162-029-10: | Female/Female connector configuration, "F" type connector                            |
| 162-027-10: | Male/Female connector configuration, "F" type connector                              |
| 162-028-10: | Female/Female connector configuration, "F" type connector with integral ground block |



COAX Protectors

| Part Numbers                               | 162-029-10/162-027-10      | 162-028-10                 |
|--|----------------------------|----------------------------|
| <b>RF Performance</b>                      |                            |                            |
| <b>Frequency Range:</b>                    | DC – 1.0GHz                | DC – 1.0GHz                |
| <b>Characteristic Impedance:</b>           | 75 Ohms                    | 75 Ohms                    |
| <b>Insertion Loss (Includes Flatness):</b> | <0.3dB / 0.2dB typical     | <0.3dB                     |
| <b>Return Loss:</b>                        | >30dB                      | >20dB                      |
| <b>Protection</b>                          |                            |                            |
| <b>DC Breakdown @ 2000V/s:</b>             | 150V to 300V               | 150V to 300V               |
| <b>Impulse Breakdown @ 100V/μs:</b>        | <450V                      | <450V                      |
| <b>Insulation Resistance:</b>              | >100 MegOhms               | >100 MegOhms               |
| <b>Surge Life<sup>3</sup></b>              |                            |                            |
| <b>10A, 10/1000μs:</b>                     | >1500 Surges               | >1500 Surges               |
| <b>100A, 10/1000μs:</b>                    | >100 Surges                | >100 Surges                |
| <b>1000A, 10/1000μs:</b>                   | >10 Surges                 | >10 Surges                 |
| <b>5000A, 8/20μs:</b>                      | >10 Surges                 | >10 Surges                 |
| <b>AC Life</b>                             |                            |                            |
| <b>5A, 1000VAC, 1s:</b>                    | >5 Operations              | >5 Operations              |
| <b>1A, 1000VAC, 1s:</b>                    | >60 Operations             | >60 Operations             |
| <b>Failshort</b>                           |                            |                            |
| <b>30A, 1000VAC:</b>                       | >15min                     | >15min                     |
| <b>Operating Temperature:</b>              | -40 to 65°C / -40 to 149°F | -40 to 65°C / -40 to 149°F |

<sup>1</sup>The ISA surge protection devices are factory wired on the load side of the service entrance and available for field replacement, these arrestors should be installed by a licensed electrician. <sup>2</sup>UL1449 3rd edition not required. <sup>3</sup>All specifications for service life only.

# Fibernode Power Enclosure



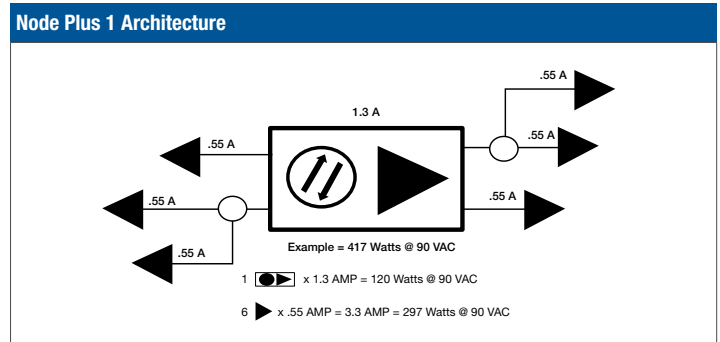
Fibernode Power Enclosure (Front)

- Designed for co-located power and fiber node configurations
- Thermally optimized for today's fiber nodes
- Flexible configurations to accommodate multiple fiber deep applications

## Architecture—N+1 (Approximately 6 Actives) XM2-906HP, 3 or 6 AlphaCell® Batteries and an AlphaGen DCX3000 Portable Generator



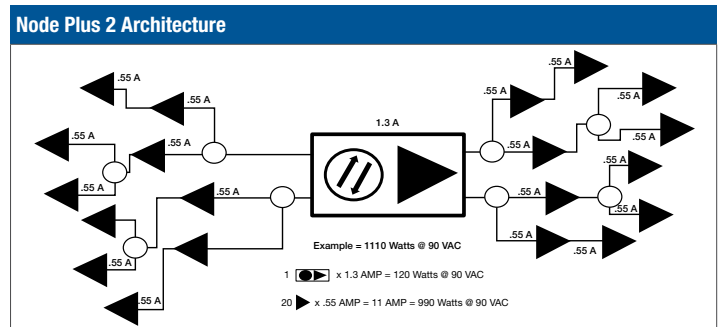
| Load             | 3 Batteries |       | 6 Batteries |       | DCX3000 | Maximum Runtime <sup>2</sup> |
|------------------|-------------|-------|-------------|-------|---------|------------------------------|
|                  | 195GXL      | 4.0HP | 195GXL      | 4.0HP |         |                              |
| 2                | 14.1        | 17.3  | 29.9        | 37.4  | 20.0    | 57.4                         |
| 3                | 10.1        | 12.4  | 21.6        | 26.7  | 19.9    | 46.6                         |
| 4                | 7.7         | 9.5   | 16.6        | 20.5  | 19.8    | 40.3                         |
| 4.6 <sup>4</sup> | 6.7         | 8.3   | 14.5        | 17.9  | 19.8    | 37.7                         |
| 5                | 6.2         | 7.7   | 13.4        | 16.5  | 19.7    | 36.2                         |



## Architecture—N+2 (Approximately 20 Actives) XM2-918HP, 3 or 6 AlphaCell® Batteries and an AlphaGen DCX3000 Portable Generator



| Load              | 3 Batteries |       | 6 Batteries |       | DCX3000 | Maximum Runtime |
|-------------------|-------------|-------|-------------|-------|---------|-----------------|
|                   | 195GXL      | 4.0HP | 195GXL      | 4.0HP |         |                 |
| 6                 | 5.0         | 6.3   | 10.9        | 13.4  | 19.5    | 32.9            |
| 8                 | 3.7         | 4.8   | 8.2         | 10.1  | 18.5    | 28.6            |
| 10                | 2.9         | 3.8   | 6.4         | 8.0   | 17.0    | 25.0            |
| 12                | 2.3         | 3.1   | 5.2         | 6.6   | 15.0    | 21.6            |
| 12.3 <sup>4</sup> | 2.2         | 3.1   | 5.1         | 6.4   | 14.8    | 21.1            |
| 14                | 1.9         | 2.7   | 4.3         | 5.5   | 13.5    | 19.0            |
| 16                | 1.6         | 2.3   | 3.7         | 4.7   | 12.0    | 16.7            |



# Fibernode Power Enclosure



Fibernode Power Enclosure (Rear)

- Universal node mounting bracket provides easy installations
- 36" width allows for horizontal node mounting
- High security option available
- Easy front and rear access

## Architecture—N+0

XM2-300HP, 1 AlphaCell Battery and 2-Battery Back-up Pack



## XM2-300HP Runtime (Hrs)

| Load | 1 Battery<br>4.0HP | Back-up Pack <sup>1</sup><br>4.0HP | Maximum Runtime<br>w/ 4.0HP and B/U Pack |
|------|--------------------|------------------------------------|--|
| 0.5  | 28.0               | 60.1                               | 88.1                                     |
| 1.0  | 14.0               | 30.1                               | 44.1                                     |
| 1.3* | 10.5               | 22.7                               | 33.3                                     |
| 1.5  | 9.1                | 19.6                               | 28.7                                     |
| 2.0  | 6.6                | 14.1                               | 20.8                                     |
| 2.5  | 5.1                | 10.9                               | 16.0                                     |
| 3.0  | 4.2                | 8.8                                | 13.0                                     |

## Fibernode Power Enclosure Specifications

|                                      |  |
|--------------------------------------|--|
| <b>Dimensions H x W x D (in/mm):</b> | 45 x 36 x 32 / 1143 x 914.4 x 812.8      |
| <b>Weight w/out Trays (lb/kg):</b>   | 145 / 66                                 |
| <b>Power Supply Capacity:</b>        | Up to two power supplies                 |
| <b>Color:</b>                        | Seafoam green, optional colors available |
| <b>Standard Features:</b>            | Removable/lockable doors                 |
| <b>Finish:</b>                       | Durable powdercoat exterior              |
| <b>Material:</b>                     | Aluminum                                 |

## Architecture — 8N+2 (8 Nodes with 1-2 Actives Each)

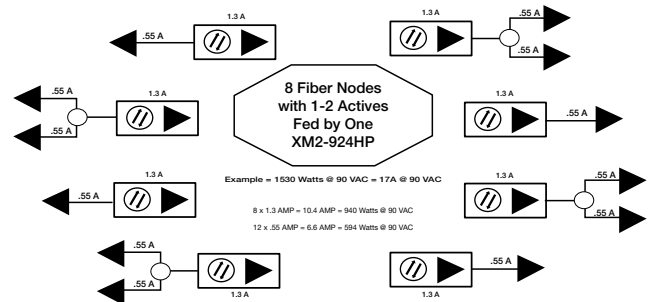
XM2-924HP, 4 or 8 AlphaCell® Batteries and an AlphaGen DCX3000 Portable Generator



## XM2-924HP Runtime (Hrs)

| Load | 4 Batteries<br>4.0HP | 8 Batteries<br>4.0HP | DCX3000 | Maximum Runtime<br>w/ 4.0HP and DCX3000 |
|------|----------------------|----------------------|---------|---|
| 14   | 3.6                  | 7.6                  | 13.5    | 21.1                                    |
| 16   | 3.1                  | 6.6                  | 12.0    | 18.6                                    |
| 17** | 3.0                  | 6.2                  | 11.5    | 17.7                                    |
| 18   | 2.8                  | 5.8                  | 11.0    | 16.8                                    |
| 20   | 2.5                  | 5.1                  | 9.5     | 14.7                                    |
| 22   | 2.2                  | 4.6                  | 9.0     | 13.6                                    |

## 8 Nodes Plus 1 Architecture



\* 120W Node or 1.3A @ 90V. <sup>1</sup> Additional runtime back-up pack of 2 AlphaCell 4.0HP batteries.  
 \*\*17A = 1530W @ 90V.

# AlphaGen™ Curbside

## Broadband Generator Systems







AlphaGen CE3x2-3G

- Cost-effective extended runtime solution for broadband powering applications
- Quiet operation, small size and low profile allow for easy installation in populated areas
- Eliminates the large quantities of batteries otherwise required for extended runtime

| Output Rating                                 | 3.5kW  | 5.0kW  | 7.5kW   |  |  |
|---|--|--|---|--|--|
| <b>DC Output Voltage:</b>                     | 39V ±0.5V @ no load 36V configuration<br>52V ±0.5V @ no load 48V configuration | 39V ±0.5V @ no load 36V configuration<br>52V ±0.5V @ no load 48V configuration | 52V ±0.5V @ no load 48V configuration<br>104V ±0.5V @ no load 96V configuration |  |  |
| <b>DC Output Load Regulation:</b>             | 0.5V   | 0.5V   | 0.5V  |  |  |
| <b>Output Current:</b>                        | 39V @ 90A max. / 52V @ 67A maximum   | 39V @ 128A max. / 52V @ 96A maximum  | 52V @ 144A max. / 104V @ 72A maximum  |  |  |
| <b>Engine:</b>                                | 398cc, air cooled, single OHV 10.5hp (using natural gas fuel)                  |  |   |  |  |
| <b>RPM (Variable Speed):</b>                  | 2800 to 3600RPM  | 2800 to 3600RPM  | 2800 to 3600RPM   |  |  |
| <b>Acoustical Noise</b>                       |  |  |   |  |  |
| <b>dBA 10' @ 100% Rated Load:</b>             | 68.7   | 68.5   | 70.3  |  |  |
| <b>dBA 20' @ 100% Rated Load:</b>             | 63   | 62.5   | 64.3  |  |  |
| <b>dBA 10' @ 70% Rated Load:</b>              | 68.3   | 66.9   | 66.4  |  |  |
| <b>dBA 20' @ 70% Rated Load:</b>              | 62.6   | 60.9   | 60.4  |  |  |
| <b>Models</b>                                 |  |  |   |  |  |
|   | <b>CE-3x2</b>  | <b>CE-9x2</b>  | <b>CE-3x2</b>   | <b>CE-9x2</b>                            | <b>PN-6x</b>   |
| <b>Dimensions H x W x D (in/mm):</b>          | 44 x 26 x 24 /<br>1117.6 x 660.4 x 609.6                                       | 52 x 26 x 24 /<br>1320.8 x 660.4 x 609.6                                       | 44 x 26 x 24 /<br>1117.6 x 660.4 x 609.6  | 52 x 26 x 24 /<br>1320.8 x 660.4 x 609.6 | 39 x 39.3 x 24 / 914 x 998.2 x 609.6<br>w/ Pedestal: 57 x 39.3 x 24 / 1447.8 x 998.2 x 609.6 |
| <b>Weight (lb/kg):</b>                        | 383 / 174  | 413 / 187  | 383 / 174   | 413 / 187                                | 338 / 174 w/ Pedestal: 370 / 168   |
| <b>APU Fuel Consumption</b>                   |  |  |   |  |  |
| <b>Natural Gas (1000BTU/Ft.<sup>3</sup>):</b> | 60ft <sup>3</sup> /hr  |  | 80ft <sup>3</sup> /hr   |  | 150ft <sup>3</sup> /hr   |
| <b>Propane Gas (2520BTU/Ft.<sup>3</sup>):</b> | 0.82gal/hr - 30ft <sup>3</sup> /hr - 3.46lb/hr                                 |  | 1.10gal/hr - 40ft <sup>3</sup> /hr - 4.62lb/hr                                  |  | 1.48gal/hr - 50ft <sup>3</sup> /hr - 6.24lb/hr   |
| <b>Exterior Surface Temperature:</b>          | 65°C / 149°F max (meets requirements of UL/CSA)                                |  |   |  |  |

| All Models                                   |  |
|--|--|
| <b>Gas Inlet Pressure:</b>                   | 0.5 to 2 PSI Inlet pressure<br>(Contact Alpha engineering for additional supply resources)   |
| <b>Ign Charger Voltage:</b>                  | 13.5VDC  |
| <b>Ign Charger Current:</b>                  | 6A maximum   |
| <b>Remote Interface Length:</b>              | 75ft typical. Distance depends upon installation, de-rating and wire gauge   |
| <b>Agency Compliance:</b>                    | UL1778, UL2200, NFPA 37/54/58 and 70, CSA C22.2 No.107.1, EMC/FCC Part 15 Class A  |
| <b>Fuel System, Controls and Monitoring:</b> | The controls and fuel system meet applicable sections of NFPA 37, 54 and 58 for automatic unattended operation of remotely located generators. Full system control and status monitoring included. |
| <b>Sensors:</b>                              | Gas hazard, pad shear, water intrusion and tamper  |
| <b>Safety Shutdowns:</b>                     | Low oil pressure, over temp, low fuel pressure shutdown (propane only), water intrusion, pad shear, gas hazard (propane or natural gas), over-speed, over-crank                                    |
| <b>Optional Feature:</b>                     | <b>Cold start kit:</b> provides additional starting capability at temperatures below -18°C / 0°F   |

| AlphaGen Configuration Options   |   |
|--|---|
|  |  |
| CE-3x2 3.5 or 5kW  | CE-9x2 3.5 or 5kW   |
|  |  |
| CE-3/9G Propane Storage for Generator<br>(For 3.5 and 5kW)                           | PN-6x 7.5kW<br>(PN-6x is not compatible with CE-3/9G)                                 |

# AlphaGen™ DCX2000

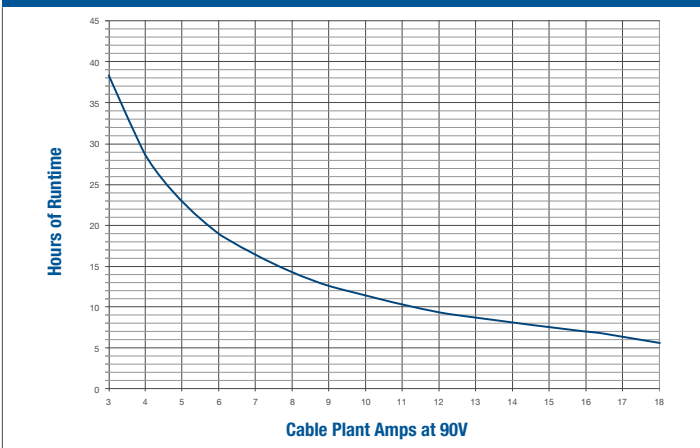
## Portable 36VDC Generator System



- Large 1.7G fuel tank for longer runtimes
- Optional remote monitor cable
- Theft resistance due to non-compatibility with household electronics
- Quiet operation, less than 71dBA at 7m (22ft)

| Details                              |   |
|--------------------------------------|---|
| <b>Engine:</b>                       | 4-stroke, OHV, single cylinder, air cooled, manual choke  |
| <b>Rated Power:</b>                  | 2,000W continuous, 2,200W maximum   |
| <b>Rated Current:</b>                | 50A   |
| <b>Alternator:</b>                   | Permanent magnet, brushless   |
| <b>36V:</b>                          | 39.5VDC nominal at generator output connector   |
| <b>Output Regulation:</b>            | ±1VDC   |
| <b>Control Features:</b>             | <ul style="list-style-type: none"> <li>• Automatic voltage regulation</li> <li>• Electronic governor</li> <li>• Over current protection</li> <li>• Digital voltmeter/ammeter</li> <li>• Hour meter</li> <li>• Reverse battery protection</li> </ul> |
| <b>Cable Interface:</b>              | Anderson type SBE-80 connector  |
| <b>Fuel Tank:</b>                    | 1.7 gallon (6.5L) metal tank  |
| Runtime                              |   |
| <b>@ 25% Load:</b>                   | 20.2hrs   |
| <b>@ 80% Load:</b>                   | 6.3hrs  |
| <b>@ 100% Load:</b>                  | 5.0hrs  |
| <b>Audible Noise:</b>                | 60 to 70dBA @ 7m  |
| <b>Dry Weight (lbs/kg):</b>          | 62 / 28   |
| <b>Weight w/ Fuel (lbs/kg):</b>      | 80 / 36.2   |
| <b>Dimensions L x W x H (in/mm):</b> | 21 x 11.4 x 19.7 / 545 x 290 x 500  |
| <b>Agency:</b>                       | <ul style="list-style-type: none"> <li>• CSA C22.2 No. 100-04</li> <li>• CSA B376</li> <li>• FCC part 15B Class A</li> <li>• CARB</li> </ul>  |

### DCX2000 Runtime



| Required Accessories                         |  |
|--|--|
| <b>Output Interface Cable:</b>               | <ul style="list-style-type: none"> <li>• 10' P/N 875-324-22</li> <li>• 30' P/N 876-011-20</li> <li>• 50' P/N 875-324-21</li> </ul> |
| <b>Battery Interface Cable (choose one):</b> | <p><b>Ring Lug Battery Interface:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-21</li> </ul>                       |
|  | <p><b>Alligator Clamp Battery Interface:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-20</li> </ul>                |
|  | <p><b>Y-Adaptor:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-22</li> </ul>  |

| Optional Accessories |  |
|----------------------|--|
|                      | <p>AG-CAB-SM, a generator status monitoring cable, is available at 10, 30 and 50' lengths and used with a DPM, DSM3x, IDH4x, IDH4L to indicate if a generator is connected and running.</p> <ul style="list-style-type: none"> <li>• 10' P/N 746-278-21</li> <li>• 30' P/N 746-278-20</li> <li>• 50' P/N 746-278-22</li> </ul> |
|                      | <p>The Cable Management Harness provides a convenient way to carry the cable and allows you to attached the cable to the generator when not in use.</p> <ul style="list-style-type: none"> <li>• P/N 042-324-10</li> </ul>   |

\* Connects the power supply's battery input directly to the generator.

# AlphaGen™ DCX3000

Portable 3kW 36/48VDC Generator System




- DC technology requires no Automatic Transfer Switch (ATS)
- Selectable output for 36 or 48VDC operation up to 3000W
- Completely enclosed, water resistant for safe operation in the field
- Oversized metal gas tank with level gauge for extended runtimes up to 20 hours

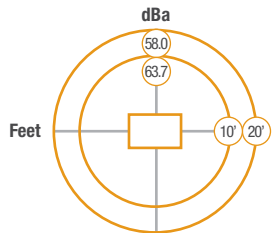
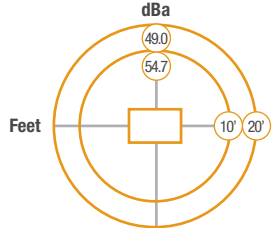
| Details             |  |
|---------------------|--|
| <b>Part Number:</b> | 041-028-10   |
| <b>Engine:</b>      | Honda GX 200 (6.5hp, air-cooled, OHV, single cylinder, manual recoil starting, manual choke) |
| <b>Rated Power:</b> | 2800W continuous, 3000W maximum  |
| <b>Alternator:</b>  | Permanent magnet, brushless, bearingless   |

| Dual Range Selector       |  |
|---------------------------|--|
| <b>36V:</b>               | 39.5VDC nominal at generator output connector  |
| <b>48V:</b>               | 52.5VDC nominal at generator output connector  |
| <b>Output Regulation:</b> | 1VDC   |
| <b>Control Features:</b>  | <ul style="list-style-type: none"> <li>• Automatic voltage regulation</li> <li>• Electronic governor</li> <li>• Over current protection</li> <li>• Analog voltmeter with back light</li> </ul> |
| <b>Cable Interface:</b>   | Anderson type SBE-80 connector   |
| <b>Fuel Tank:</b>         | 3.4 gallon metal tank with level gauge   |

| Runtime                              |  |
|--------------------------------------|--|
| <b>@ 25% Load:</b>                   | 20hrs  |
| <b>@ 80% Load:</b>                   | 10hrs  |
| <b>@ 100% Load:</b>                  | 7.2hrs   |
| <b>Audible Noise:</b>                | Approximatley 65dBa @ 7m under full load                             |
| <b>Frame:</b>                        | Fully enclosed   |
| <b>Dry Weight (lbs/kg):</b>          | Less than 118 / 53.5   |
| <b>Dimensions H x W x D (in/mm):</b> | 22 x 17.6 x 25.9 / 569 x 480 x 655                                   |
| <b>Agency:</b>                       | CSA C22.2 No. 100-95, 107.1-01, 107.2-M89, 0.4, FCC part 15B Class A |

| Required Accessories                         |  |
|--|--|
| <b>Output Interface Cable:</b>               |  <ul style="list-style-type: none"> <li>• 10' P/N 875-324-22</li> <li>• 30' P/N 876-011-20</li> <li>• 50' P/N 875-324-21</li> </ul> |
| <b>Battery Interface Cable (choose one):</b> |  <p><b>Ring Lug Battery Interface:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-21</li> </ul>                       |
|  |  <p><b>Alligator Clamp Battery Interface:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-20</li> </ul>                |
|  |  <p><b>Y-Adaptor*:</b></p> <ul style="list-style-type: none"> <li>• P/N 874-946-22</li> </ul>                                       |

| Optional Accessories  |   |
|-----------------------|---|
| <b>DCX-PG-WK:</b>     | Portable generator wheel kit (P/N 745-793-20)             |
| <b>DCX-PG-HANDLE:</b> | Locking handle (P/N 745-792-20)                           |
| <b>AG-PG-TOOL:</b>    | Punch tool kit for enclosures (P/N 745-131-20)            |
| <b>AG-PG-UK:</b>      | Enclosure upgrade kit (P/N 745-131-21)                    |
| <b>AG-CAB-KIT:</b>    | Cable bag with cable and key lanyard (P/N 745-764-21-001) |

| Sound Levels   |   |
|--|---|
| Ambient background noise level at 45dBa, all readings are 8 point averages |   |
| <b>@ 100% Rated Load:</b>  |   |
| <b>@ 25% Rated Load (Typical):</b>   |  |

\* Connects the power supply's battery input directly to the generator.



# AlphaGen™ ACX2000i

## Inverter Generator

- Large 1.4G fuel tank for longer runtimes
- Quiet operation
- Inverter equipped for clean AC power
- Limited 12VDC output
- Fuel economy switch



| Specifications  |   |
|---|---|
| <b>Rated/Maximum Output (W):</b>                        | 1900 / 2000   |
| <b>Automatic Low Oil Shutdown:</b>                      | Yes   |
| <b>Certifications:</b>                                  | EPA, CETL, CARB, ISO 9001                           |
| <b>Choke:</b>   | Manual  |
| <b>Continuous Run Time (Full Load/¼ Load):</b>          | 3.0 hrs / 7.5 hrs                                   |
| <b>DC Output:</b>                                       | 12V to 8.3A   |
| <b>Dry Weight (lb/kg):</b>                              | 62 / 28   |
| <b>Circuit Breaker:</b>                                 | Inverter controlled                                 |
| <b>Engine Type:</b>                                     | Single cylinder, 4-stroke OHV, Air cooled, gasoline |
| <b>Fuel Economy Switch:</b>                             | Yes   |
| <b>Fuel Type:</b>                                       | Unleaded gasoline                                   |
| <b>Fuel Tank Capacity (gallon/liter):</b>               | 1.4 / 5.3   |
| <b>Dimensions L x W x D (in/mm):</b>                    | 22 x 11 x 19 / 558.8 x 279.4 x 482.6                |
| <b>Horsepower (hp/cc):</b>                              | 4.3 / 125   |
| <b>Ignition System:</b>                                 | Electronic ignition                                 |
| <b>Maximum Current (A):</b>                             | 16.7  |
| <b>Maximum Output (kW):</b>                             | 2.0   |
| <b>Noise Level db @ 23ft/ 7m (Zero load/full load):</b> | 56dB / 66dB   |
| <b>Oil Capacity (oz):</b>                               | 15.6  |
| <b>Oil Type:</b>  | 15W-40  |
| <b>Overload Reset Switch:</b>                           | No  |
| <b>Primer Bulb:</b>                                     | Yes   |
| <b>Rated Current (A):</b>                               | 15.8  |
| <b>Rated Frequency (Hz):</b>                            | 60  |
| <b>Rated Output (kW):</b>                               | 1.9   |
| <b>Rated Voltage (V):</b>                               | 120   |
| <b>Receptacles:</b>                                     | One 120V, 20A 5-20R Duplex                          |
| <b>Starting System:</b>                                 | Recoil  |

| Features                           |  |
|------------------------------------|--|
| <b>Accessories Included:</b>       | Oil jug, 12V charge cable, spare spark plug, spark plug wrench and handle, manual, keys and remote, oil drain extension, spare 10A glass tube fuse |
| <b>Automatic Low Oil Shutdown:</b> | Yes  |
| <b>Certifications:</b>             | EPA, CETL, CARB, ISO 9001  |
| <b>Choke:</b>                      | Manual   |
| <b>Circuit Breaker:</b>            | Panel mounted  |
| <b>Fuel Economy Switch:</b>        | Yes  |
| <b>Fuel Gauge:</b>                 | No   |
| <b>Hour Meter:</b>                 | No   |
| <b>Ignition System:</b>            | Electronic ignition  |
| <b>Inverter Equipped:</b>          | Yes  |
| <b>Overload Reset Switch:</b>      | No   |
| <b>Parallel Ready:</b>             | No   |
| <b>Phase:</b>                      | Single   |
| <b>Primer Bulb:</b>                | Yes  |
| <b>Structure:</b>                  | Enclosed   |
| <b>Wheels:</b>                     | No   |

| Included Accessories |  |
|----------------------|--|
|                      | <ul style="list-style-type: none"> <li>• Oil Jug</li> <li>• 12V Charge Cable</li> <li>• Spare Spark Plug</li> <li>• Spark Plug Wrench &amp; Handle</li> <li>• Manual</li> <li>• Oil Drain Extension</li> </ul> |

# AlphaCell® 3.5HP & 4.0HP

Pure Lead Batteries



- Pure lead technology provides up to 20% increased life expectancy
- Up to 6-year full warranty with XM3-HP
- Non-spillable UN2800 rating for ease of transportation
- 4.0HP offering 240 cable runtime minutes
- String count reduction to reduce OpEx

You can use fewer AlphaCell HP batteries compared to standard batteries, while maintaining network runtime reliability. For power supply loads that are less than 8A you can achieve a 4 hour runtime using a single string of 4.0HP batteries, compared to using two strings of competitive batteries. Consult your Alpha sales engineer for a free network analysis on how to potentially reduce your OpEx by up to 25 percent while increasing the reliability of the batteries in your network.

| Models  | 3.5HP  | 4.0HP  |
|---|--|--|
| <b>Operating Temperature Range (w/ Temperature Compensation):</b> | -40 to 140°F / -40 to 60°C (Charger temperature compensation @±4mVpC per °C)             |  |
| <b>Storage Temperature:</b>                                       | 14 to 104°F / -10 to 40°C  |  |
| <b>Self Discharge:</b>  | Battery can be store for up to 18 months @ 77°F/25°C                                     | Battery can be store for up to 18 months @ 77°F/25°C   |
| <b>Voltage Per Unit:</b>  | 12V  |  |
| <b>Float Charge Voltage:</b>                                      | 13.5 to 13.8VDC average per 12V unit at 77°F/25°C  | 13.5 to 13.8VDC average per 12V unit at 77°F/25°C      |
| <b>Refresh/Boost Charging Voltage:</b>                            | 14.4 to 15.0VDC average per 12V unit at 77°F/25°C  | 14.4 to 15.0VDC average per 12V unit at 77°F/25°C      |
| <b>Maximum AC Ripple (Charger):</b>                               | 0.5% RMS or 1.5% of float recommended for best results. Maximum voltage allowed = 4% P/P |  |
| <b>Terminal Type:</b>   | Threaded alloy insert terminal to accept ¼" 20UNC bolt                                   | Threaded alloy insert terminal to accept ¼" 20UNC bolt |
| <b>Terminal Hardware Torque:</b>                                  | 110in-lbs / 12.4NM   |  |
| <b>Case Sizes:</b>  | 31   |  |
| <b>Dimensions H x L x W (in/mm):</b>                              | 8.5 x 13.4 x 6.8 / 223.5 x 337.0 x 172.7   |  |
| <b>Weight Approximate (lbs/kg):</b>                               | 68 / 30.8  |  |

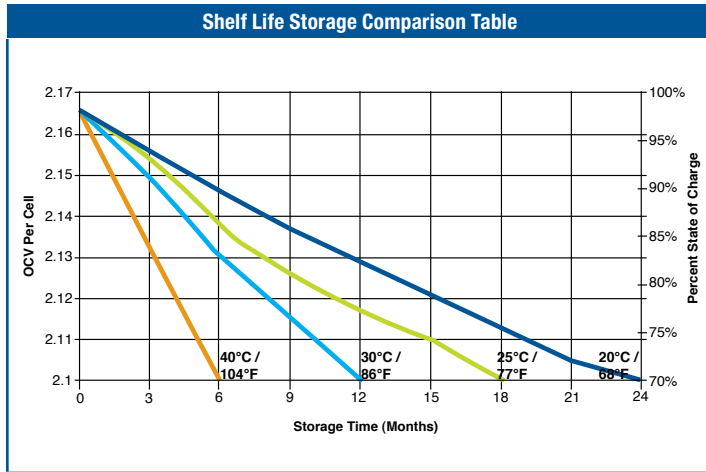
| Battery   | 3.5HP       | 4.0HP       |
|---|-------------|-------------|
| <b>Runtime Rating 25A (@ 25°C / 77°F to 1.75VPC):</b>               | 210 minutes | 240 minutes |
| <b>Amp Hour Capacity 20Hr Rate (@ 25°C / 77°F to 1.75VPC):</b>      | 104Ah       | 114Ah       |
| <b>Amp Hour Capacity 10Hr Rate (@ 20°C / 68°F to 1.80VPC):</b>      | 95Ah        | 102Ah       |
| <b>Maximum Discharge Current:</b>                                   | 800A        | 900A        |
| <b>Short Circuit Current:</b>                                       | 2800A       | 3200A       |
| <b>Impedance 60Hz (Approximate):</b>                                | 0.0027Ω     | 0.0022Ω     |
| <b>Conductance Range Fully Charged New Battery (@ 25°C / 77°F):</b> | 1550-1850   | 1800-2100   |

| Constant Current Nominal Ratings in Amps (@ 77°F / 25°C to 1.75V per Cell) |      |      |      |      |      |      |      |      |     |     |
|--|------|------|------|------|------|------|------|------|-----|-----|
| Discharge Time (Hours)   | 1    | 2    | 3    | 4    | 5    | 6    | 8    | 10   | 12  | 20  |
| <b>3.5HP:</b>  | 70.2 | 40.3 | 28.6 | 22.3 | 18.2 | 15.3 | 12.1 | 9.9  | 8.4 | 5.2 |
| <b>4.0HP:</b>  | 81.9 | 45.8 | 32.2 | 25.0 | 19.9 | 16.7 | 13.1 | 10.6 | 9.1 | 5.7 |

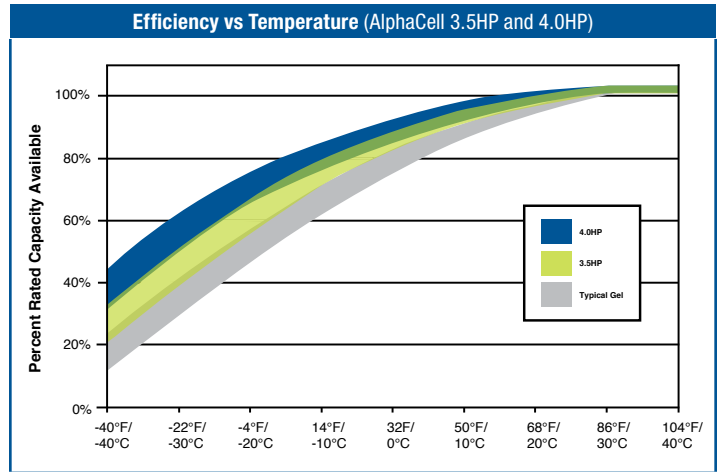
# AlphaCell® 3.5HP & 4.0HP

Runtime for Pure Lead Batteries

➤ 3 to 5 times longer shelf life vs. standard VRLA



➤ Provides up to 50% increased runtime in coldest climates



**Estimated Runtime Minutes Using XM3-918HP (Deduct 4-6% for Legacy XM Power Supplies)**

| 90VAC @      | 4A    |       | 6A    |       | 8A    |       | 10A   |       |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Models:      | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries: | 540   | 588   | 358   | 394   | 263   | 295   | 204   | 234   |
| 6 Batteries: | 1144  | 1264  | 771   | 841   | 574   | 324   | 450   | 491   |
| 9 Batteries: | 1757  | 1980  | 1191  | 1318  | 892   | 977   | 704   | 767   |

| 90VAC @      | 12A   |       | 14A   |       | 16A   |       | 18A   |       |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Models:      | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries: | 165   | 193   | 137   | 164   | 116   | 142   | 100   | 123   |
| 6 Batteries: | 368   | 404   | 308   | 342   | 264   | 295   | 227   | 257   |
| 9 Batteries: | 578   | 629   | 486   | 530   | 418   | 457   | 361   | 396   |

**Estimated Runtime Minutes Using XM3-918HP (Deduct 4-6% for Legacy XM Power Supplies)**

| 60VAC @      | 4A    |       | 6A    |       | 8A    |       | 10A   |       |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Models:      | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries: | 797   | 871   | 534   | 581   | 395   | 432   | 308   | 342   |
| 6 Batteries: | 1669  | 1876  | 1131  | 1249  | 846   | 925   | 667   | 727   |
| 9 Batteries: | 2551  | 2931  | 1737  | 1956  | 1305  | 1450  | 1034  | 1138  |

| 60VAC @      | 12A   |       | 14A   |       | 16A   |       | 18A   |       |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Models:      | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP | 3.5HP | 4.0HP |
| 3 Batteries: | 251   | 282   | 209   | 239   | 178   | 207   | 152   | 180   |
| 6 Batteries: | 547   | 596   | 461   | 502   | 396   | 433   | 341   | 376   |
| 9 Batteries: | 852   | 932   | 720   | 784   | 620   | 675   | 537   | 584   |

Note: Calculation are Based on .92 cable plant factor @ 25°C / 77°F

# AlphaCell® GXL

GelCell Batteries

- True gel silver alloy minimizes grid corrosion
- Maintenance-free threaded inserts—no periodic retorquing
- Full-replacement, non-prorated warranty



| Models   | 220GXL  | 195GXL                                      | 165GXL                                     |
|--|---|---|--|
| Operating Temperature Range (w/ Temperature Compensation): |   |   |  |
| Storage Temperature:                                       |   |   |  |
| Self Discharge:  |   |   |  |
| Voltage Per Unit:  | 12.8V   | 12.8V                                       | 12.8V                                      |
| Float Charge Voltage:                                      | 13.5 to 13.8VDC   | 13.5 to 13.8VDC                             | 13.5 to 13.8VDC                            |
| Refresh/Boost Charging Voltage:                            |   |   |  |
| Maximum AC Ripple (Charger):                               | 0.5% RMS or 1.5% of float charge voltage recommended for best results. Maximum allowed = 4% P-P |   |  |
| Terminal Type:   |   |   |  |
| Terminal Hardware Torque:                                  |   |   |  |
| Case Sizes:  |   |   |  |
| Dimensions H x L x W (in/mm):                              | 8.48 x 13.42 x 6.80 / 215.4 x 340.9 x 172.7   | 8.48 x 13.42 x 6.80 / 215.4 x 340.9 x 172.7 | 8.05 x 12.5 x 6.83 / 204.5 x 317.8 x 173.4 |
| Weight Approximate (lbs/kg):                               | 73 / 33.2   | 67 / 30.5                                   | 63 / 28.6                                  |

| Battery  | 220GXL      | 195GXL      | 165GXL      |
|--|-------------|-------------|-------------|
| Runtime Rating 25A (@ 25°C / 77°F to 1.75Vpc):               | 221 minutes | 196 minutes | 165 minutes |
| Amp Hour Capacity 20Hr Rate (@ 25°C / 77°F to 1.75Vpc):      | 109Ah       | 100Ah       | 86Ah        |
| Maximum Discharge Current:                                   | 900A        | 900A        | 800A        |
| Short Circuit Current:                                       | 2800A       | 2600A       | 2500A       |
| Impedance 60Hz (Approximate):                                | 0.0050Ω     | 0.0050Ω     | 0.0055Ω     |
| Conductance Range Fully Charged New Battery (@ 25°C / 77°F): |             |             |             |

| Constant Current Nominal Ratings in Amps (@ 25°C / 77°F to 1.75V per Cell) |   |   |   |   |   |   |   |    |    |    |  |
|--|---|---|---|---|---|---|---|----|----|----|--|
| Discharge Time (Hours)   | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 20 |  |
| 220GXL:  |   |   |   |   |   |   |   |    |    |    |  |
| 195GXL:  |   |   |   |   |   |   |   |    |    |    |  |
| 165GXL:  |   |   |   |   |   |   |   |    |    |    |  |

| Estimated Runtime Minutes Using XM2 |        |        |        |        |        |        |        |        |        |        |        |        |  |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| 90VAC @                             |        | 4A     |        |        | 6A     |        |        | 8A     |        |        | 10A    |        |  |
| Models:                             | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL |  |
| 3 Batteries:                        | 508    | 453    | 369    | 320    | 285    | 249    | 236    | 209    | 193    | 186    | 165    | 144    |  |
| 4 Batteries:                        | 701    | 625    | 546    | 444    | 396    | 346    | 329    | 293    | 256    | 261    | 232    | 203    |  |
| 6 Batteries:                        | 1091   | 978    | 853    | 701    | 625    | 546    | 523    | 465    | 407    | 418    | 372    | 325    |  |
| 8 Batteries:                        | 1487   | 1338   | 1165   | 960    | 859    | 750    | 720    | 643    | 562    | 577    | 515    | 450    |  |
| 9 Batteries:                        | 1686   | 1519   | 1322   | 1091   | 978    | 853    | 820    | 733    | 640    | 659    | 587    | 514    |  |
| 90VAC @                             |        | 12A    |        |        | 14A    |        |        | 16A    |        |        | 18A    |        |  |
| Models:                             | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL |  |
| 3 Batteries:                        | 149    | 132    | 115    | 119    | 106    | 92     | 101    | 899    | 77     | 87     | 78     | 66     |  |
| 4 Batteries:                        | 210    | 187    | 163    | 169    | 151    | 132    | 144    | 128    | 112    | 124    | 111    | 96     |  |
| 6 Batteries:                        | 339    | 301    | 264    | 275    | 245    | 214    | 236    | 209    | 183    | 204    | 182    | 159    |  |
| 8 Batteries:                        | 478    | 419    | 367    | 385    | 341    | 299    | 329    | 293    | 256    | 288    | 255    | 223    |  |
| 9 Batteries:                        | 538    | 479    | 419    | 440    | 391    | 342    | 377    | 335    | 294    | 329    | 293    | 256    |  |

| Estimated Runtime Minutes Using XM2 |        |        |        |        |        |        |        |        |        |        |        |        |  |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| 60VAC @                             |        | 4A     |        |        | 6A     |        |        | 8A     |        |        | 10A    |        |  |
| Models:                             | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL |  |
| 3 Batteries:                        | 798    | 712    | 622    | 508    | 453    | 396    | 377    | 335    | 294    | 300    | 267    | 233    |  |
| 4 Batteries:                        | 1091   | 978    | 853    | 701    | 625    | 546    | 523    | 465    | 407    | 418    | 372    | 325    |  |
| 6 Batteries:                        | 1686   | 1519   | 1322   | 1091   | 978    | 853    | 820    | 733    | 640    | 659    | 587    | 514    |  |
| 8 Batteries:                        | 2288   | 2067   | 1798   | 1487   | 1338   | 1165   | 1122   | 1006   | 877    | 904    | 809    | 706    |  |
| 9 Batteries:                        | 2590   | 2345   | 2037   | 1686   | 1519   | 1322   | 1273   | 1143   | 997    | 1027   | 921    | 803    |  |
| 60VAC @                             |        | 12A    |        |        | 14A    |        |        | 16A    |        |        | 18A    |        |  |
| Models:                             | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL | 220GXL | 195GXL | 195GXL |  |
| 3 Batteries:                        | 242    | 215    | 188    | 196    | 174    | 151    | 166    | 148    | 125    | 144    | 128    | 107    |  |
| 4 Batteries:                        | 339    | 301    | 264    | 275    | 245    | 214    | 236    | 209    | 182    | 204    | 182    | 155    |  |
| 6 Batteries:                        | 538    | 479    | 419    | 440    | 391    | 340    | 377    | 335    | 290    | 329    | 293    | 252    |  |
| 8 Batteries:                        | 741    | 660    | 577    | 607    | 541    | 470    | 523    | 465    | 402    | 458    | 407    | 351    |  |
| 9 Batteries:                        | 843    | 753    | 658    | 692    | 617    | 538    | 597    | 531    | 462    | 523    | 465    | 402    |  |

# AlphaCell® MS Endur

## Headend Batteries



MsEndur

- 20-year design life batteries with VRLA technology
- Space saving design for the greatest amount of power in a small footprint
- Customizable to your system's configuration needs

### C&D MS Endur (345 to 2180Ah)

| Part Number   | # Cells/Module | # Plates/Cell | Nom Ah Cap (8hr) | System # of Cells | System Voltage | Dimensions H x W x D (in/mm)              | Weight (lb/kg) | Cell Layout (W x H) |
|---------------|----------------|---------------|------------------|-------------------|----------------|---|----------------|---------------------|
| RAA64024CE01: | 3              | 7             | 345              | 24                | 48             | 42.26 x 22.61 x 24.75 / 1073 x 574 x 629  | 1960 / 889     | 6 x 4               |
| RBB46024CE01: | 3              | 9             | 480              | 24                | 48             | 62.14 x 19.32 x 24.75 / 1578 x 491 x 629  | 2454 / 1113    | 4 x 6               |
| RBB64024CE01: | 3              | 9             | 480              | 24                | 48             | 42.26 x 27.86 x 24.75 / 1073 x 708 x 629  | 2430 / 1102    | 6 x 4               |
| RCC46024CE01: | 3              | 11            | 599              | 24                | 48             | 62.14 x 22.61 x 24.75 / 1578 x 574 x 629  | 2916 / 1323    | 4 x 6               |
| RDF38024CE01: | 3              | 15            | 839              | 24                | 48             | 82.02 x 22.61 x 24.75 / 2083 x 574 x 629  | 3644 / 1653    | 3 x 8               |
| RDF46024CE01: | 3              | 15            | 839              | 24                | 48             | 62.14 x 27.86 x 24.75 / 1578 x 708 x 629  | 3610 / 1637    | 4 x 6               |
| REH38024CE01: | 3              | 19            | 1079             | 24                | 48             | 82.02 x 22.61 x 24.75 / 2083 x 664 x 629  | 4531 / 2055    | 3 x 8               |
| REH46024CE01: | 3              | 19            | 1079             | 24                | 48             | 62.14 x 34.44 x 24.75 / 1578 x 875 x 629  | 4481 / 2033    | 4 x 6               |
| RFK38024CE01: | 3              | 23            | 1319             | 24                | 48             | 82.02 x 30.44 x 24.75 / 2083 x 773 x 629  | 5275 / 2393    | 3 x 8               |
| RFK46024CE01: | 3              | 23            | 1319             | 24                | 48             | 62.14 x 39.54 x 24.75 / 1578 x 1004 x 629 | 5223 / 2369    | 4 x 6               |
| RHP38024CE01: | 3              | 27            | 1559             | 24                | 48             | 82.02 x 34.44 x 24.75 / 2083 x 875 x 629  | 6043 / 2741    | 3 x 8               |
| RHP46024CE01: | 3              | 27            | 1559             | 24                | 48             | 62.14 x 45.53 x 24.75 / 1578 x 1156 x 629 | 6225 / 2824    | 4 x 6               |
| RJS38024CE01: | 3              | 35            | 2038             | 24                | 48             | 82.02 x 43.62 x 24.75 / 2083 x 1108 x 629 | 7901 / 3584    | 3 x 8               |
| RJS46024CE01: | 3              | 35            | 2038             | 24                | 48             | 62.14 x 58.37 x 24.75 / 1578 x 1483 x 629 | 8120 / 3683    | 4 x 6               |

### East Penn Unigy II (760 to 2000Ah)

| Part Number  | # Cells/Module | # Plates/Cell | Nom Ah Cap (8hr) | System # of Cells | System Voltage | Dimensions H x W x D (in/mm)                      | Weight (lb/kg) | Cell Layout (W x H) |
|--------------|----------------|---------------|------------------|-------------------|----------------|---|----------------|---------------------|
| 24AVR95-19:  | 3              | 19            | 855              | 24                | 48             | 68.32 x 24.15 x 27.12 / 1735.32 x 613.41 x 688.84 | 3612 / 1638    | 3 x 8               |
| 24AVR95-21:  | 3              | 21            | 950              | 24                | 48             | 68.32 x 26.4 x 27.12 / 1735.32 x 670.56 x 688.84  | 3956 / 1794    | 3 x 8               |
| 24AVR95-23:  | 3              | 23            | 1045             | 24                | 48             | 68.32 x 28.65 x 27.12 / 1735.32 x 727.71 x 688.84 | 4308 / 1954    | 3 x 8               |
| 24AVR95-25:  | 3              | 25            | 1140             | 24                | 48             | 68.32 x 30.9 x 27.12 / 1735.32 x 784.86 x 688.84  | 4652 / 2110    | 3 x 8               |
| 24AVR95-27:  | 3              | 27            | 1235             | 24                | 48             | 68.32 x 33.15 x 27.12 / 1735.32 x 842.01 x 688.84 | 4972 / 2255    | 3 x 8               |
| 24AVR95-29:  | 3              | 29            | 1330             | 24                | 48             | 68.32 x 35.4 x 27.12 / 1735.32 x 899.16 x 688.84  | 5348 / 2426    | 3 x 8               |
| 24AVR95-31:  | 3              | 31            | 1425             | 24                | 48             | 68.32 x 37.65 x 27.12 / 899.16 x 956.13 x 688.84  | 5668 / 2571    | 3 x 8               |
| 24AVR95-33:  | 3              | 33            | 1520             | 24                | 48             | 68.32 x 39.9 x 27.12 / 1735.32 x 101.46 x 688.84  | 6020 / 2737    | 3 x 8               |
| 24AVR125-33: | 2              | 33            | 2000             | 24                | 48             | 68.32 x 26.6 x 27.12 / 1735.32 x 675.64 x 688.84  | 8616 / 3908    | (2 x 6) x 2         |

### GNB Absolyte GP

| Part Number | # Plates/Cell | Nom Ah Cap (8hr) | System Voltage | Dimensions H x W x D (in/mm)                   | Weight (lb/kg) | Cell Layout (W x H) |
|-------------|---------------|------------------|----------------|--|----------------|---------------------|
| 100G13:     |               | 600              | 48             | 26.4 x 8.55 x 20 / 624.84 x 217.17 x 508       |                |                     |
| 100G15:     | 15            | 696              | 48             | 26.4 x 8.59 x 22.2 / 624.84 x 218.18 x 563.88  | 2992 / 1357    | 3 x 8               |
| 100G17:     | 17            | 800              | 48             | 26.4 x 8.59 x 24.5 / 624.84 x 218.18 x 622.3   | 3391 / 1539    | 3 x 8               |
| 100G19:     | 19            | 896              | 48             | 26.4 x 8.59 x 26.8 / 624.84 x 218.18 x 680.70  | 3760 / 1706    | 3 x 8               |
| 100G21:     | 21            | 1000             | 48             | 26.4 x 8.59 x 29.1 / 624.84 x 218.18 x 739.14  | 4120 / 1869    | 3 x 8               |
| 100G23:     | 23            | 1096             | 48             | 26.4 x 8.59 x 31.3 / 624.84 x 218.18 x 795.02  | 4488 / 2036    | 3 x 8               |
| 100G25:     | 25            | 1200             | 48             | 26.4 x 8.59 x 33.6 / 624.84 x 218.18 x 853.44  | 4864 / 2206    | 3 x 8               |
| 100G27:     | 27            | 1296             | 48             | 26.4 x 8.59 x 35.8 / 624.84 x 218.18 x 909.32  | 5224 / 2370    | 3 x 8               |
| 100G29:     | 29            | 1400             | 48             | 26.4 x 8.59 x 38 / 624.84 x 218.18 x 956.2     | 5632 / 2555    | 3 x 8               |
| 100G31:     | 31            | 1496             | 48             | 26.4 x 8.59 x 40.3 / 624.84 x 218.18 x 1023.62 | 6000 / 2722    | 3 x 8               |
| 100G33:     | 33            | 1600             | 48             | 26.4 x 8.59 x 42.6 / 624.84 x 218.18 x 1082.04 | 6360 / 2885    | 3 x 8               |

# AlphaCell® XTV

Extreme Temperature Cable Broadband Batteries



- **Extreme temperature** Absorbed Glass Mat (AGM) technology
- **Significant cold temperature** performance improvement over gel
- **Longer runtimes** help increase network reliability
- **Multiple models** provide options for all network architectures
- **Power density** gains allow more runtime from smaller sized battery

| General   | 100XTV  | 150XTV                                | 195XTV  | 240XTV                                |
|---|---|---------------------------------------|---|---------------------------------------|
| <b>Operating Temperature Range</b> (w/ Temperature Compensation): | -40 to 60°C / -40 to 140°F (charger temperature compensation @ ±3.3mVpc per °C)   |                                       |   |                                       |
| <b>Storage Temperature:</b>                                       | -10 to 40°C / 14 to 104°F   | -10 to 40°C / 14 to 104°F             | -10 to 40°C / 14 to 104°F                               | -10 to 40°C / 14 to 104°F             |
| <b>Self Discharge:</b>  | Battery can be stored up to 12 months at 25°C / 77°F. Higher temperatures during storage will require more frequent recharge. |                                       |   |                                       |
| <b>Voltage Per Unit:</b>  | 12V   | 12V                                   | 12V   | 12V                                   |
| <b>Float Charge Voltage:</b>                                      | 13.5 to 13.8VDC average per 12V unit at 25°C / 77°F   |                                       |   |                                       |
| <b>Refresh/Boost Charging Voltage:</b>                            | 14.4 to 15.0VDC average 12V unit at 25°C / 77°F   |                                       |   |                                       |
| <b>Maximum AC Ripple (Charger):</b>                               | 0.5% RMS or 1.5% of float recommended for best results. Maximum voltage allowed = 4% P/P                                      |                                       |   |                                       |
| <b>Terminal Type:</b>   | Threaded alloy insert terminal to accept M6 x 12mm bolt   |                                       | Threaded alloy insert terminal to accept M6 x 20mm bolt |                                       |
| <b>Terminal Hardware Torque:</b>                                  | 13.6NM / 120in-lbs  | 13.6NM / 120in-lbs                    | 13.6NM / 120in-lbs                                      | 13.6NM / 120in-lbs                    |
| <b>Case Sizes:</b>  | 22NF  | 24                                    | 27  | 31                                    |
| <b>Dimensions H x L x W (in/mm):</b>                              | 8.17 x 9.01 x 5.46 / 207 x 228 x 138  | 8.44 x 10.85 x 6.65 / 214 x 275 x 168 | 8.43 x 12.71 x 6.67 / 214 x 322 x 169                   | 8.57 x 13.50 x 6.71 / 217 x 343 x 170 |
| <b>Weight Approximate (lbs/kg):</b>                               | 39 / 17.7   | 56 / 25.4                             | 67 / 30.5   | 75 / 32                               |

| Battery <sup>1</sup>  | 100XTV      | 150XTV      | 195XTV      | 240XTV      |
|---|-------------|-------------|-------------|-------------|
| <b>Runtime Rating 25A</b> (@ 25°C / 77°F to 1.75Vpc):               | 100 minutes | 150 minutes | 195 minutes | 240 minutes |
| <b>Amp Hour Capacity 20Hr Rate</b> (@ 25°C / 77°F to 1.75Vpc):      | 56Ah        | 80Ah        | 100Ah       | 112Ah       |
| <b>Maximum Discharge Current:</b>                                   | 300A        | 800A        | 800A        | 850A        |
| <b>Short Circuit Current:</b>                                       | 1450A       | 1900A       | 2250A       | 2650A       |
| <b>Impedance 60Hz</b> (approximate):                                | 0.005Ω      | 0.0045Ω     | 0.0039Ω     | 0.0034Ω     |
| <b>Conductance Range Fully Charged New Battery</b> (@ 25°C / 77°F): | 700 - 800   | 900 - 1100  | 1050 - 1250 | 1250 - 1550 |

| Constant Current Nominal Ratings in Amps <sup>2</sup> (@ 25°C / 77°F to 1.75V per Cell) |      |      |      |      |      |      |      |      |     |     |  |
|---|------|------|------|------|------|------|------|------|-----|-----|--|
| Discharge Time (Hours)  | 1    | 2    | 3    | 4    | 5    | 6    | 8    | 10   | 12  | 20  |  |
| <b>100XTV:</b>  | 39.4 | 22.1 | 15.8 | 12.4 | 10.3 | 8.7  | 6.7  | 5.4  | 4.6 | 2.8 |  |
| <b>150XTV:</b>  | 53.0 | 30.6 | 21.6 | 16.8 | 13.9 | 11.9 | 9.3  | 7.7  | 6.5 | 4.0 |  |
| <b>195XTV:</b>  | 65.5 | 37.6 | 26.9 | 21.0 | 17.3 | 14.7 | 11.3 | 9.4  | 7.9 | 5.0 |  |
| <b>240XTV:</b>  | 81.7 | 45.5 | 32.1 | 25.0 | 19.8 | 16.6 | 13.0 | 10.5 | 9.0 | 5.6 |  |

| Estimated Runtime Minutes Using XM3-918HP <sup>2</sup> (Deduct 4-6% for Legacy XM Power Supplies) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |  |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| 90VAC @   |        | 4A     |        |        |        | 6A     |        |        |        | 8A     |        |        |        | 10A    |        |        |  |
| Models:   | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV |  |
| <b>3 Batteries:</b>   | 280    | 401    | 506    | 581    | 183    | 262    | 335    | 389    | 133    | 190    | 245    | 289    | 101    | 146    | 190    | 228    |  |
| <b>6 Batteries:</b>   | 597    | 869    | 1083   | 1240   | 402    | 579    | 726    | 830    | 298    | 427    | 538    | 617    | 232    | 332    | 421    | 485    |  |
| <b>9 Batteries:</b>   | 914    | 1349   | 1673   | 1927   | 621    | 905    | 1128   | 1292   | 465    | 672    | 841    | 961    | 366    | 527    | 662    | 757    |  |
| 90VAC @   |        | 12A    |        |        |        | 14A    |        |        |        | 16A    |        |        |        | 18A    |        |        |  |
| Models:   | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV |  |
| <b>3 Batteries:</b>   | 81     | 117    | 153    | 188    | 66     | 96     | 127    | 158    | 55     | 81     | 108    | 136    | 47     | 69     | 92     | 118    |  |
| <b>6 Batteries:</b>   | 188    | 269    | 344    | 399    | 157    | 224    | 288    | 336    | 133    | 191    | 246    | 290    | 113    | 163    | 211    | 251    |  |
| <b>9 Batteries:</b>   | 300    | 430    | 542    | 621    | 252    | 360    | 456    | 524    | 215    | 307    | 391    | 451    | 185    | 264    | 337    | 391    |  |

| Estimated Runtime Minutes Using XM3-624HP <sup>2</sup> (Deduct 4-6% for Legacy XM, VMX, and GMX Power Supplies) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |  |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| 60VAC @   |        | 4A     |        |        |        | 6A     |        |        |        | 8A     |        |        |        | 10A    |        |        |  |
| Models:   | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV |  |
| <b>3 Batteries:</b>   | 416    | 599    | 751    | 858    | 276    | 396    | 500    | 574    | 203    | 290    | 369    | 427    | 157    | 224    | 288    | 336    |  |
| <b>6 Batteries:</b>   | 869    | 1280   | 1588   | 1828   | 590    | 858    | 1070   | 1225   | 441    | 637    | 797    | 912    | 347    | 499    | 627    | 717    |  |
| <b>9 Batteries:</b>   | 1321   | 1941   | 2441   | 2832   | 904    | 1333   | 1653   | 1904   | 681    | 995    | 1237   | 1419   | 539    | 783    | 977    | 1118   |  |
| 60VAC @   |        | 12A    |        |        |        | 14A    |        |        |        | 16A    |        |        |        | 18A    |        |        |  |
| Models:   | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV | 100XTV | 150XTV | 195XTV | 240XTV |  |
| <b>3 Batteries:</b>   | 126    | 181    | 234    | 276    | 104    | 150    | 195    | 233    | 87     | 127    | 166    | 201    | 74     | 108    | 142    | 175    |  |
| <b>6 Batteries:</b>   | 284    | 407    | 513    | 589    | 238    | 340    | 431    | 497    | 203    | 291    | 370    | 428    | 174    | 249    | 319    | 371    |  |
| <b>9 Batteries:</b>   | 444    | 641    | 803    | 918    | 375    | 539    | 677    | 774    | 322    | 432    | 582    | 667    | 278    | 398    | 503    | 577    |  |

# AlphaCell® SMU

## 10-Year Front Terminal Batteries



AlphaCell SMU

- Take advantage of your cable buying power on batteries
- Alpha offers cable companies the most competitive pricing on UPS and DC plant batteries, including C&D, GNB and East Penn 10 and 20 year VRLA batteries
- Alpha Technologies Services offers removal, replacement and recycling of UPS Batteries

| C&D Tel Series |             |                               |   |                |                 |
|----------------|-------------|-------------------------------|---|----------------|-----------------|
| Part Number    | Model Volts | Capacity @ 8hr rate @ 1.75V/C | Dimensions L x W x H (in/mm)              | Weight (lb/kg) | Terminal Type   |
| Tel12-105F:    | 12          | 100                           | 22.6 x 4.9 x 9.0 / 573.7 x 126.5 x 229.2  | 80 / 36        | Threaded Insert |
| Tel12-150F:    | 12          | 151                           | 21.9 x 4.9 x 12.5 / 557.5 x 122.7 x 318.3 | 131 / 60       | Threaded Insert |

| GNB Marathon |             |                               |                                    |                |                 |
|--------------|-------------|-------------------------------|------------------------------------|----------------|-----------------|
| Part Number  | Model Volts | Capacity @ 8hr rate @ 1.75V/C | Dimensions L x W x H (in/mm)       | Weight (lb/kg) | Terminal Type   |
| M12V90FT:    | 12          | 90                            | 156 x 4.1 x 10.6 / 395 x 105 x 270 | 68 / 31        | Threaded Insert |
| M12V105FT:   | 12          | 104                           | 20.1 x 4.3 x 9.4 / 511 x 110 x 238 | 79 / 35.8      | Threaded Insert |
| M12V125FT:   | 12          | 125                           | 22 x 4.9 x 11.1 / 559 x 124 x 283  | 105 / 47.6     | Threaded Insert |
| M12V155FT:   | 12          | 155                           | 22 x 4.9 x 11.1 / 559 x 124 x 283  | 119 / 53.8     | Threaded Insert |

| AlphaCell SMU-F |             |                               |                                     |                |                           |                        |
|-----------------|-------------|-------------------------------|-------------------------------------|----------------|---------------------------|------------------------|
| Part Number     | Model Volts | Capacity @ 8hr rate @ 1.75V/C | Dimensions L x W x H (in/mm)        | Weight (lb/kg) | Top Access Stud Hole Size | Front Access Stud Size |
| SMU12-50FR:     | 12          | 50                            | 15.4 x 4.1 x 8.9 / 390 x 105 x 227  | 47.4 / 21.5    | 8mm                       | 6mm                    |
| SMU12-75FR:     | 12          | 74                            | 21.9 x 4.1 x 8.9 / 558 x 105 x 227  | 68.3 / 31      | 8mm                       | 6mm                    |
| SMU12-85FR:     | 12          | 86                            | 15.6 x 4.1 x 10.6 / 395 x 105 x 270 | 69.5 / 31.5    | 8mm                       | 6mm                    |
| SMU12-105FR:    | 12          | 102                           | 20.1 x 4.3 x 9.4 / 511 x 110 x 238  | 79.4 / 36      | 8mm                       | 6mm                    |
| SMU12-125FR:    | 12          | 112                           | 21.9 x 4.9 x 10.6 / 558 x 125 x 270 | 108 / 49       | 8mm                       | 6mm                    |
| SMU12-155FR:    | 12          | 150                           | 21.9 x 4.9 x 11.1 / 558 x 125 x 283 | 119 / 54       | 8mm                       | 6mm                    |
| SMU12-170FR:    | 12          | 172                           | 21.9 x 4.9 x 12.2 / 558 x 124 x 310 | 129.8 / 59     | 8mm                       | 6mm                    |

| Tel Series 10 Year Batteries <sup>1</sup> (Top Terminal) |             |                               |   |                |                           |
|--|-------------|-------------------------------|---|----------------|---------------------------|
| Part Number  | Model Volts | Capacity @ 8hr rate @ 1.75V/C | Dimensions L x W x H (in/mm)              | Weight (lb/kg) | Top Access Stud Hole Size |
| Tel12-30:  | 12          | 30                            | 7.8 x 5.2 x 6.8 / 197.4 x 131.9 x 172.7   | 27 / 12        | Threaded Insert           |
| Tel12-45:  | 12          | 46                            | 8.9 x 5.4 x 8.1 / 228.3 x 138.9 x 205.6   | 40 / 18        | Threaded Insert           |
| Tel12-70:  | 12          | 69                            | 10.3 x 6.8 x 8.0 / 260.5 x 173.4 x 203.6  | 55 / 25        | Threaded Insert           |
| Tel12-80:  | 12          | 79                            | 12.0 x 6.8 x 8.1 / 305.8 x 173.4 x 205.3  | 68 / 31        | Threaded Insert           |
| Tel12-90:  | 12          | 88                            | 13.5 x 6.8 x 8.5 / 343.1 x 171.7 x 216.2  | 72 / 33        | Threaded Insert           |
| Tel12-125:   | 12          | 127                           | 13.6 x 6.8 x 10.9 / 344.7 x 171.7 x 277.7 | 100 / 45       | Threaded Insert           |

| UPS (Flame Retardant High Rate Series) |             |                |   |                |                 |
|--|-------------|----------------|---|----------------|-----------------|
| Part Number                            | Model Volts | Watts per cell | Dimensions L x W x H (in/mm)              | Weight (lb/kg) | Terminal Type   |
| UPS12-100MR:                           | 12          | 91             | 6.5 x 5.2 x 6.9 / 166.2 x 131.3 x 174.3   | 21 / 10        | Flag terminal   |
| UPS12-150MR:                           | 12          | 148            | 7.8 x 5.2 x 6.8 / 197.1 x 131.9 x 172.7   | 27 / 12        | Threaded Insert |
| UPS12-210MR:                           | 12          | 206            | 9.0 x 5.5 x 8.1 / 228.6 x 139.2 x 205.1   | 40 / 18        | Threaded Insert |
| UPS12-300MR:                           | 12          | 300            | 10.3 x 6.8 x 8.0 / 260.9 x 173.4 x 203.5  | 57 / 26        | Threaded Insert |
| UPS12-350MR:                           | 12          | 350            | 12.0 x 6.8 x 8.1 / 305.8 x 173.4 x 204.8  | 67 / 30        | Threaded Insert |
| UPS12-400MR:                           | 12          | 400            | 13.4 x 6.8 x 8.5 / 340.9 x 172.7 x 216.4  | 74 / 34        | Threaded Insert |
| UPS12-490MR:                           | 12          | 488            | 13.6 x 6.8 x 10.9 / 344.7 x 172.7 x 277.7 | 10 / 45        | Threaded Insert |
| UPS12-540MR:                           | 12          | 537            | 12.6 x 6.9 x 8.9 / 320.8 x 177.0 x 227.2  | 100 / 45       | Threaded Insert |
| UPS6-620MR:                            | 6           | 620            | 12.6 x 6.9 x 9.9 / 321 x 177 x 253        | 72 / 33        | Threaded Insert |

<sup>1</sup> SLC versions available with Cable Assembly Terminal Type. Model numbers include/SLC after the model (ex. Tel12-30/SLC).

# AlphaGuard™

## Battery Charge Management System



AlphaGuard CMT-3



Potted AlphaGuard CMT-3

- Maximizes battery life
- Spreads charge voltage equally across batteries
- Compensates for battery differences as they age
- Replace single batteries, not the entire string
- Single battery connections for charge management and status monitoring
- Safe unattended operation designed to CSA C22.2 No. 107.1 and UL 1778 Standards
- Optional potted AlphaGuard for underground battery vault applications

| Models   |  |
|--|--|
| <b>AG-CMT-3:</b>   | AlphaGuard Charge Management SC, 36V —including 36VDC battery string interface cable |
| <b>AG-CMT-4:</b>   | AlphaGuard Charge Management SC, 48V —including 48VDC battery string interface cable |
| <b>AG-CMT-3SC-P-C:</b>   | AlphaGuard 36VDC, Potted with 6ft sense wires*                                       |
| <b>AG-CMT-3SC-P:</b>   | AlphaGuard 36VDC, Potted without sense wires*  |
| <b>AG-CMT-4SC-P-C:</b>   | AlphaGuard 48VDC, Potted with 6ft sense wires*                                       |
| <b>AG-CMT-4SC-P:</b>   | AlphaGuard 48VDC, Potted without sense wire*   |
| Configuration  |  |
| <b>Quantity:</b>   | One (1) AlphaGuard is required per battery string                                    |
| <b>Service Location:</b>   | With the battery string  |
| Mechanical   |  |
| <b>Housing Material:</b>   | High impact plastic  |
| <b>Dimensions H x W x D (in/mm):</b>   | 1.4 x 4.8 x 4.3 / 36 x 122 x 108   |
| <b>Weight (lb/kg):</b>   | 0.8 / .36  |
| <b>Potted Weight (lb/kg):</b>  | 1.5 / .68  |
| Environment  |  |
| <b>Operating Temperature:</b>  | -40 to 55°C / -40 to 131°F   |
| <b>Humidity</b>  | 5 to 95% non-condensing  |
| Warranty   |  |
| <b>Warranty:</b>   | 5 years  |
| Electrical   |  |
| <b>Batteries:</b>  | Individual 12VDC nominal batteries configured into 36 or 48VDC strings               |
| <b>Circuit Protection:</b>   | Single blow fuse, reverse polarity protected   |
| <b>Quiescent Current Draw:</b>   | 1mA max. (Current consumed by AlphaGuard after low voltage total shutdown)           |
| <b>Charge Management:</b>  | Most effective during float period of charge   |
| <b>Maximum Current:</b>  | 2A @ 25°C / 77°F   |
| <b>Quality of Final Balance:</b>   | ±100mV max. between any two (2) batteries  |
| <b>Charging Efficiency:</b>  | 80 to 90%  |
| <b>Charge Balance:</b>   | ±100mV typical   |
| <b>Low Voltage Cutoff:</b>   | 34.5VDC / 46VDC ±5%  |
| <b>Communication to XM2:</b>   | AlphaGuard configured DSM communications card  |
| <b>Voltage Sense Regulation:</b>   | ±100mV   |
| Cables   |  |
| AG-DSM-S9-Cable, AG-DSM-D9-Cable, AG-DSM-D35-Cable, AG-DSM-S35-Cable, Battery Cable 36V 6ft, Battery 48V 6ft |  |

\* The sense wires are preconnectorized and 6ft in length. The 6ft length allows connection to one of the four extension cables shown below.



# Battery Testing Equipment

AlphaCell® Battery Testing Equipment

- Complete battery life trending through conductance tests
- Non-intrusive conductance measurements do not reduce string life
- Quick, accurate measurements and data recording reduce onsite time
- Simple pinpoint testing requires only access to two battery posts or straps
- Enables early detection of questionable batteries in the network

| Model   |  |
|---|--|
| <b>Model Number:</b>  | Celltron Essential                                   |
| <b>Model Number:</b>  | CTE-1200AT (w/temperature sensor)                    |
| <b>Applications:</b>  | Tests 6 and 12V batteries with data retention        |
| <b>Voltage:</b>   | 1.5 to 20VDC   |
| <b>Conductance:</b>   | 100 to 9999 Siemens                                  |
| <b>Test Data Storage:</b>   | Up to 144 consecutive tests can be stored internally |
| <b>Accuracy:</b>  | +2% across test range                                |
| <b>Voltmeter Resolution:</b>  | 10mVDC   |
| Environment   |  |
| <b>Operating Temperature:</b>   | 0 to 40°C / 32 to 104°F                              |
| <b>Humidity:</b>  | 95% non-condensing                                   |
| Kit Contents  |  |
| <ul style="list-style-type: none"><li>• CTE-1200AT tester</li><li>• PowerSure Software</li><li>• Infrared PC data cable</li></ul> |  |



Celltron Essential CTE-1200AT



# FIBER POWER

Alpha Technologies offers a complete portfolio of fiber-to-the-home powering options with the FlexPoint™ line of 12VDC single-family unit solutions (SFU) and the FlexNet™ line of 48VDC multiple dwelling unit (MDU) and small office home office (SOHO) power supplies. All of Alpha's powering solutions are engineered to perform reliably in the most demanding environmental conditions while optimizing battery life and performance.

- **FlexPoint™ AX 12VDC .....52**
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- **FlexNet™ 48VDC 50W.....55**
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- **Radium MiniBay .....58**
- **Flexible Backhaul Enclosure 2322.....59**

# FlexPoint™ AX 12VDC

## PON Battery Backup Power Supplies

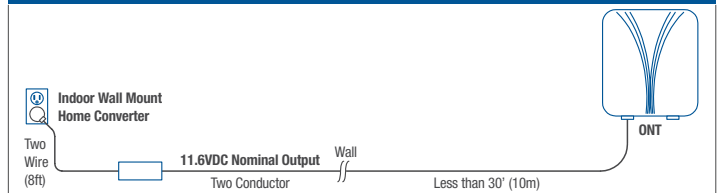
- Full or partial outdoor configurations
- Outdoor rated BBPS including battery for 24/7 availability
- Utility meter base provides most reliable source of AC power at home



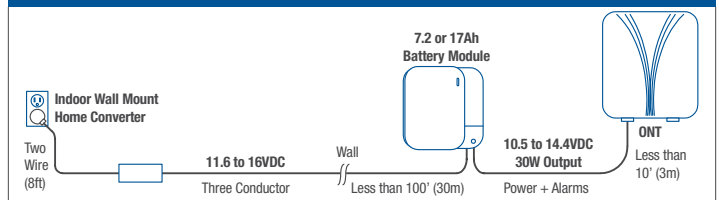
| Input (International AC Selections and Line Cords Available) |   |
|--|---|
| <b>AC Input Voltage:</b>                                     | <b>AX30-12D-HC:</b> 85 to 132VAC (120VAC nominal)<br><b>AX30-12D-SFPC:</b> 216 to 254VAC (240VAC nominal)   |
| <b>AC Input Frequency:</b>                                   | <b>AX30-12D-HC:</b> 50 to 60Hz<br><b>AX30-12D-SFPC:</b> 60Hz  |
| Output   |   |
| <b>DC Output Voltage:</b>                                    | <b>SFPC + BBPS / HC + BBPS (UPS System):</b> 10.5 to 14.4VDC<br><b>SFPC / HC (Non-UPS System):</b> 11.6VDC  |
| <b>Continuous Output Power:</b>                              | <b>HC + BBPS (UPS System):</b> 30W at nominal battery float charge<br><b>SFPC + BBPS (UPS System):</b> 30W at nominal battery float charge<br><b>HC (Non-UPS System):</b> 24W<br><b>SFPC (Non-UPS System):</b> 30W @ -40 to 55°C, 20W @ 65°C              |
| <b>Current Limit:</b>  | 2.4A current limit (HC), 3.2A current limit (SFPC)  |
| <b>Short Circuit Protection:</b>                             | Electronic  |
| <b>DC Ripple:</b>  | 150mV   |
| Environment  |   |
| <b>Operating Temperature Range:</b>                          | <b>AX30-12D-SFPC + BBPS:</b> -40 to 113°F (-40 to 45°C)<br><b>AX30-12D-HC + BBPS:</b> -40 to 113°F (-40 to 45°C)<br><b>AX30-12D-HC:</b> -40 to 113°F (-40 to 45°C)<br><b>AX30-12D-SFPC:</b> -40 to 149°F (-40 to 65°C)<br>unit derates above 131°F (55°C) |
| <b>Humidity:</b>   | 0 to 95%  |
| <b>Battery Storage:</b>                                      | 5 to 149°F (-15 to 65°C), 0 to 95% humidity   |
| <b>Elevation Operation Max:</b>                              | 10,000ft (3000m)  |
| <b>Elevation Storage Max:</b>                                | 50,000ft (15000m)   |
| Battery  |   |
| <b>Type:</b>   | Maintenance-free, leak-proof, sealed VRLA (valve regulated lead acid)   |
| <b>Typical Recharge Time:</b>                                | <b>AX-12D-BBPS-7.2:</b> <16hrs with 24W load<br><b>AX-12D-BBPS-17:</b> <36hrs with 24W load   |
| Regulatory Approvals   |   |
| <b>Home Converter:</b>                                       | NRTL/C LPS, FCC Part 15 Class B, UL/CSA UR UL 60950-1   |
| <b>Power-Ring:</b>   | UR UL414  |
| <b>Safety Fuse Power-Ring Converter:</b>                     | UR UL60950-1, UL SU2745   |
| <b>BBPS Modules:</b>   | NRTL/C  |
| Warranty   |   |
| <b>Electronics:</b>  | 2 year  |
| <b>Battery (standard):</b>                                   | 1 year  |
| <b>Battery (long life):</b>                                  | 3 year  |
| Status Alarms (Local LED Indicators)                         |   |
| <b>Green Steady:</b>   | Output OK   |
| <b>Green Blinking:</b>                                       | Standby operation   |
| <b>Red Steady:</b>   | Replace battery   |
| <b>Red Blinking:</b>   | Battery missing / battery low   |
| Remote Status Alarms (PacketCable Compliant)                 |   |
| <b>AC Fail:</b>  | Output power drawn from battery   |
| <b>Replace Battery:</b>                                      | Battery has failed periodic self-test   |
| <b>Battery Missing:</b>                                      | Battery is disconnected   |
| <b>Battery Low:</b>  | Battery has less than 20% remaining runtime   |

## Applications

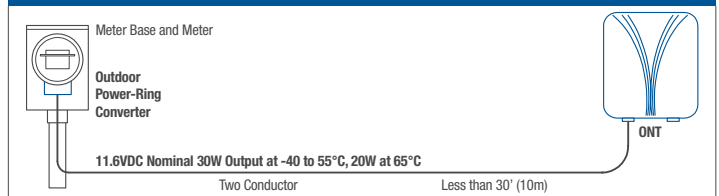
### Indoor Powering—Non-UPS



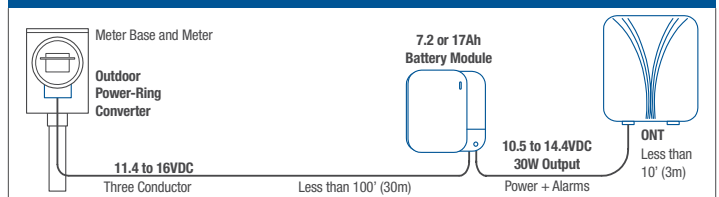
### Indoor Powering—UPS



### Outdoor Powering—Non-UPS



### Outdoor Powering—UPS



# FlexPoint™ Product Family

Indoor 12VDC UPS Power Series

- Telecommunications grade power system provides 15W, 32W & 50W of 12VDC UPS power for FTTH applications
- Replaceable 5Ah to 12Ah battery
- Battery management system provides optimum service life and runtime
- Local visual and audible status indicators and remote alarm interface
- Packet Cable™ interface options

FP1215 & FP1232  
with 5 to 8Ah battery



FP1215, FP1232 & FP1250  
with 12Ah battery

| Input OPS           |                                   |                                |
|---------------------|-----------------------------------|--------------------------------|
| AC Input Voltage:   | 110VAC or 240VAC                  |                                |
| AC Input Frequency: | 50/60Hz                           |                                |
| Surge Protection:   | Standard                          | Level                          |
|                     | Telcordia GR-1089                 | 1.2x50ms combination wave, 2kV |
|                     | ANSI/IEEE C62.41<br>IEC 61000-4-5 |                                |

| Output                               | FP1215  | FP1232                 | FP1250                 |
|--------------------------------------|---|------------------------|------------------------|
| Operational Output Power (ONT Load): | 15W<br>max. continuous                          | 32W<br>max. continuous | 50W<br>max. continuous |
| Output Voltage:                      | 12VDC nominal (battery voltage upon loss of AC) |                        |                        |

| Mechanical   | FP1215                                    | FP1232                                     | FP1250                                     |
|--|---|--|--|
| Unit Dimensions for 5, 6.5, 7.2 or 8Ah Battery<br>L x W x D (in/mm): | 6.6 x 7.5 x 3.2 /<br>167.6 x 190.5 x 83.3 | 6.6 x 7.5 x 3.2 /<br>167.6 x 190.5 x 83.3  | —  |
| Unit Dimensions for 12Ah Battery<br>L x W x D (in/mm):               | —   | 6.6 x 7.5 x 4.3 /<br>167.6 x 190.5 x 109.3 | 6.6 x 7.5 x 4.3 /<br>167.6 x 190.5 x 109.3 |
| Weight Without Battery (lb/kg):                                      | 1.2 / 0.54                                | 1.3 / 0.58                                 | 1.4 / 0.63                                 |
| 5.0Ah Battery Weight (lb/kg):  | 3.9 / 1.8                                 |  |  |
| 6.5Ah Battery Weight (lb/kg):  | 4.3 / 1.97                                |  |  |
| 7.2Ah Battery Weight (lb/kg):  | 5.7 / 2.6                                 |  |  |
| 8.0Ah Battery Weight (lb/kg):  | 5.73 / 2.7                                |  |  |
| 12Ah Battery Weight (lb/kg):   | 8.4 / 3.8                                 |  |  |

| Estimated Battery Runtimes | FP1215  |     | FP1232 |     | FP1250 |     |
|----------------------------|---|-----|--------|-----|--------|-----|
| Load                       | 7.5W  | 15W | 16W    | 32W | 36W    | 50W |
| 5.0Ah Battery (hrs):       | 6.3   | 2.8 | 2.5    | 1.1 | 0.9    | 0.7 |
| 6.5Ah Battery (hrs):       | 8.3   | 3.7 | 3.4    | 1.5 | 1.3    | 0.9 |
| 7.2Ah Battery (hrs):       | 9.9   | 4.2 | 3.9    | 1.6 | 1.4    | 1.0 |
| 8.0Ah Battery (hrs):       | 11.2  | 5.0 | 4.7    | 2.0 | 1.7    | 1.1 |
| 12Ah Battery (hrs):        | 17.3  | 8.0 | 7.5    | 3.3 | 2.9    | 2.0 |
| Battery Type:              | Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA) |     |        |     |        |     |

| Visual Indicators          |   |
|----------------------------|---|
| AC Power:                  | Green LED On: AC power present and powering the ONT   |
| Battery:                   | Green LED On: Battery powering ONT during AC loss   |
|                            | Green Flashing: Battery powering ONT during AC loss and running low                                 |
| Replace Battery:           | Red LED Off: Battery present and working correctly<br>Red LED On: Replace battery / battery missing |
| Auxiliary Power Indicator: | Green LED Light: AUX power connected  |

| Audible Status Indicators |   |
|---------------------------|---|
| Loss of Input Power:      | Single, one second chirp                  |
| Low Battery:              | Single chirp every 15 seconds at 25% SOC  |
| Replace Battery:          | Double chirp spaced fifteen minutes apart |

| Push Buttons   |   |
|----------------|---|
| DC Start:      | Press and hold when unit is off to start up on battery when AC is not present   |
| Silence Alarm: | When any audible alarm is on, press this key at least 1 second and release to silence the audible alarm until power is cycled |

| Agency Compliance |  |
|-------------------|--|
| System:           | FCC part 15 Class B, NRTL\C (60950-1), CE, C-Tick/RCM, RoHS to EU 2011_65_EC |

| Environment                  |  |
|------------------------------|--|
| Storage Temperature:         | -20 to 45°C / 4 to 113°F   |
| Operating Temperature:       | -20 to 45°C / 4 to 113°F   |
| Humidity:                    | 5 to 95% non condensing  |
| Elevation Operation Maximum: | 3,000m / 10,000ft derate at 2°C / 35.6°F per 304.8m / 1,000ft above 1,828.8m / 6,000ft |
| Elevation Storage Maximum:   | 15,000m / 50,000ft   |

| Interface  |   |
|------------|---|
| DC Output: | Removable screw terminal plug accepts (2) 16AWG and (5) 24AWG wires |
| AC Input:  | IEC 320/C6 inlet  |
| Line Cord: | NEMA 5-15 to IEC 320 C5 (other power cords available upon request)  |

| Warranty                     |                          |
|------------------------------|--------------------------|
| FlexPoint 1215, 1232 & 1250: | 1 year repair or replace |
| Batteries Available:         | 1 year or 3 year         |

| Models and Power Line Cords |              |               |   |
|-----------------------------|--------------|---------------|---|
| FP1215                      | FP1232       | FP1250        | Power Line Cord (Determined by Model)                     |
| FP-1215-5A                  | FP-1232-8A   | FP-1250-12A   | 120VAC 3-conductor NEMA 5-15 power cord                   |
| FP-1215-5B                  | FP-1232-8B   | FP-1250-12B   | 230VAC 3-conductor Schuko input power cord                |
| FP-1215-5C                  | FP-1232-8C   | FP-1250-12C   | 230VAC 3-conductor United Kingdom input power cord        |
| FP-1215-5D                  | FP-1232-8D   | FP-1250-12D   | 240VAC 3-conductor Australia/New Zealand input power cord |
| —                           | FP-1232-8-6C | FP-1250-12-6C | 120VAC 3-conductor NEMA 5-15 power cord with BC cable     |

| Supporting Options |   |
|--------------------|---|
| AX-STDBAT-5:       | Battery 5.1Ah AGM, 1 year warranty                    |
| AX-LONGBAT-5:      | Battery 5.1Ah AGM, 3 year warranty                    |
| AX-STDBAT-6.5:     | Battery 6.5Ah AGM, 1 year warranty                    |
| AX-STDBAT-7:       | Battery 7.2Ah AGM, 1 year warranty                    |
| AX-LONGBAT-7:      | Battery 7.2Ah AGM, 3 year warranty                    |
| AX-LONGBAT-8:      | Battery 8.0Ah AGM, 3 year warranty                    |
| AX-STDBAT-12:      | Battery 12Ah AGM, 1 year warranty                     |
| FTTH-CBL:          | ONT hook-up cable, 2x16AWG and 5x24AWG, CMX UL listed |
| 12Ah Cover:        | 12Ah battery cover and velcro strap                   |

# FlexPoint™ 1208-F

Indoor 12VDC RFoG UPS Power



- Telecommunications grade power system provides 8W of 12VDC UPS power for Radio Frequency over Glass (RFoG) applications
- Replaceable, 5Ah to 8Ah battery
- Battery management system, provides optimum service life and runtime
- Local visual and audible status indicators

| Input OPS           |  |                                   |
|---------------------|--|-----------------------------------|
| AC Input Voltage:   | 110VAC or 240VAC                                       |                                   |
| AC Input Frequency: | 50/60Hz  |                                   |
| Surge Protection:   | Standard   | Level                             |
|                     | Telcordia GR-1089<br>ANSI/IEEE C62.41<br>IEC 61000-4-5 | 1.2x50ms combination wave,<br>2kV |

| Output                               |   |
|--------------------------------------|---|
| Operational Output Power (ONT Load): | 8W maximum continuous                           |
| Output Voltage:                      | 12VDC nominal (battery voltage upon loss of AC) |

| Mechanical                         |   |
|------------------------------------|---|
| Unit Dimensions L x W x D (in/mm): | 6.6 x 7.5 x 3.28 / 167.64 x 190.5 x 83.31 |
| Weight without Battery (lb/kg):    | 1.2 / 0.54                                |
| 5.1Ah Battery Weight (lb/kg):      | 3.9 / 1.8                                 |
| 6.5Ah Battery Weight (lb/kg):      | 4.3 / 1.97                                |
| 7.2Ah Battery Weight (lb/kg):      | 5.7 / 2.6                                 |
| 8.0Ah Battery Weight (lb/kg):      | 5.73 / 2.7                                |

| Estimated Battery Runtimes    |   |      |
|-------------------------------|---|------|
| Load                          | 1.5W  | 4W   |
| 5.1Ah Battery Runtime (Hrs):  | 34.2  | 12.7 |
| 6.5Ah Battery Runtime (Hrs):  | 44.8  | 16.6 |
| 7.2Ah Battery Runtime (Hrs):  | 54.4  | 20.0 |
| 8.0Ah Battery Runtime (Hrs):  | 60.7  | 22.4 |
| 12.0Ah Battery Runtime (Hrs): | 92.4  | 34.2 |
| Battery Type:                 | Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA) |      |

| Visual Indicators          |   |
|----------------------------|---|
| AC Power:                  | <b>Green LED On:</b> AC power present and powering the ONT  |
| Battery:                   | <b>Green LED On:</b> Battery powering ONT during AC loss  |
|                            | <b>Green Flashing:</b> Battery powering ONT during AC loss and running low  |
| Replace Battery:           | <b>Red LED Off:</b> Battery present and working correctly<br><b>Red LED On:</b> Replace battery / battery missing |
| Auxiliary Power Indicator: | <b>Green LED Light:</b> AUX power connected   |

| Audible Status Indicators |   |
|---------------------------|---|
| Loss of Input Power:      | Single, one second chirp                  |
| Low Battery:              | Single chirp every 15 seconds at 25% SOC  |
| Replace Battery:          | Double chirp spaced fifteen minutes apart |

| Push Buttons   |   |
|----------------|---|
| DC Start:      | Press and hold when unit is off to start up on battery when AC is not present   |
| Silence Alarm: | When any audible alarm is on, press this key at least 1 second and release to silence the audible alarm until power is cycled |

| Agency Compliance |  |
|-------------------|--|
| System:           | FCC part 15 Class B, NRTLIC (60950-1), CE, C-Tick/RCM, RoHS to EU 2011_65_EC |

| Environment                  |  |
|------------------------------|--|
| Storage Temperature:         | -20 to 45°C / 4 to 113°F   |
| Operating Temperature:       | -20 to 45°C / 4 to 113°F   |
| Humidity:                    | 5 to 95% non condensing  |
| Elevation Operation Maximum: | 3,000m / 10,000ft derate at 2°C / 35.6°F per 304.8m / 1,000ft above 1,828.8m / 6,000ft |
| Elevation Storage Maximum:   | 15,000m / 50,000ft   |

| Interface  |   |
|------------|---|
| DC Output: | Removable screw terminal plug accepts (2) 16AWG and (5) 24AWG wires   |
| AC Input:  | IEC 320/C6 inlet  |
| Line Cord: | NEMA 5-15 to IEC 320 C5<br>(other power cords available upon request) |

| Warranty             |                          |
|----------------------|--------------------------|
| FlexPoint 1208-F:    | 1 year repair or replace |
| Batteries Available: | 1 year or 3 year         |

| Models and Power Line Cords |   |
|-----------------------------|---|
| Model                       | Power Line Cord (Determined by Model)                     |
| FP1208F-5A:                 | 120VAC 3-Conductor NEMA 5-15 power cord                   |
| FP1208F-5B:                 | 240VAC 3-Conductor Schuko input power cord                |
| FP1208F-5C:                 | 240VAC 3-Conductor United Kingdom input power cord        |
| FP1208F-5D:                 | 240VAC 3-Conductor Australia/New Zealand input power cord |

| Supporting Options |                                    |
|--------------------|------------------------------------|
| AX-STDBAT-5:       | Battery 5.1Ah AGM, 1 year warranty |
| AX-LONGBAT-5:      | Battery 5.1Ah AGM, 3 year warranty |
| AX-STDBAT-6.5:     | Battery 6.5Ah AGM, 1 year warranty |
| AX-STDBAT-7:       | Battery 7.2Ah AGM, 1 year warranty |
| AX-LONGBAT-7:      | Battery 7.2Ah AGM, 3 year warranty |
| AX-LONGBAT-8:      | Battery 8.0Ah AGM, 3 year warranty |

# FlexNet™ 48VDC 50W

Battery Backup Power Supplies

- Rugged outdoor or indoor 48VDC 50W wall or pole mount UPS
- Aesthetically pleasing, minimizes presence in public locations
- Optional compensated battery charging for optimum battery life
- Local and remote status monitoring and reporting



FlexNet MPS48-7 Series

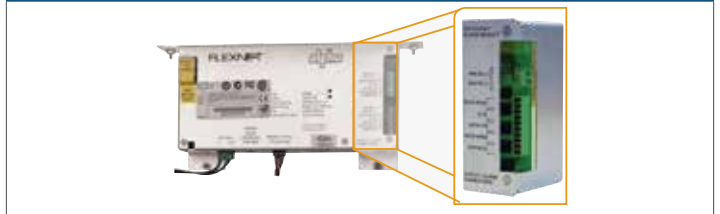
## Specifications

|   |  |
|---|--|
| <b>Input:</b>                               | 90 to 132 or 180 to 264VAC                   |
| <b>Output Voltage:</b>                      | 42 to 56VDC                                  |
| <b>Output Power:</b>                        | 50W continuous                               |
| <b>Output Interface (Module-F):</b>         | Packet Cable Alarms                          |
| <b>Output Interface (Module-T):</b>         | Dry Contact Alarms                           |
| <b>Unit Dimensions H x W x D (in/mm):</b>   | 4.18 x 8.75 x 2.12 / 106.17 x 222.25 x 53.84 |
| <b>Weight (lb/kg):</b>                      | 1.5 / 0.68                                   |
| <b>System Dimensions H x W x D (in/mm):</b> | 17.5 x 12.75 x 5.25 / 445 x 324 x 133        |
| <b>Weight (lb/kg):</b>                      | 11 / 4.9, 34.6 / 15.7 w/ batteries           |
| <b>Number of Batteries:</b>                 | Four 7.2Ah Valve Regulated Lead Acid (VRLA)  |
| <b>Runtime:</b>                             | 18 Hours @ 20W load, 8 Hours @ 40W load      |

## FN50-48-7F (With Output Interface Module-F)



## FN50-48-7T (With Output Interface Module-T)



# FlexNet™ 48VDC 150W

Battery Backup Power Supplies

- FTTP outdoor UPS for Multiple Dwelling, Multiple Tenant and Small Business Unit applications
- Battery management performs periodic battery capacity testing and status reporting to the ONT and customer
- Battery heater option provides extended runtime for applications in cold weather conditions
- Status indicators and audible alarm provide local reporting

## Specifications

|   |  |
|---|--|
| <b>Input:</b>                             | 90 to 320VAC   |
| <b>Output Voltage:</b>                    | 42 to 58VDC  |
| <b>Output Power:</b>                      | 150 Watts continuous                                 |
| <b>FMPS Dimensions H x W x D (in/mm):</b> | 23.75 x 14 x 5.5 / 603.25 x 355.6 x 139.7            |
| <b>Weight (lb/kg):</b>                    | 25 / 11.3  |
| <b>Number of Batteries:</b>               | Four or eight 7.2Ah Valve Regulated Lead Acid (VRLA) |



FlexNet FMPS



# FlexNet™ 48VDC 300W

Battery Backup Power Supplies



FlexNet ELPM-300

- 300W 48VDC UPS for outdoor or indoor applications
- Power modules can be used in a variety of Alpha enclosures
- Temperature compensated battery charging for extended battery life
- Flexible cabinet mounting
- Visual and electrical indicators for onsite and remote reporting

| FlexNet ELPM-300 Specifications      |                                       |
|--------------------------------------|---------------------------------------|
| <b>Input:</b>                        | 85 to 170 or 132 to 264VAC selectable |
| <b>Frequency:</b>                    | 50 or 60Hz                            |
| <b>Output Voltage:</b>               | 42 to 54VDC                           |
| <b>Output Power:</b>                 | 300 Watts                             |
| <b>Dimensions H x W x D (in/mm):</b> | 6 x 10.1 x 3.25 / 152 x 256.5 x 82.6  |
| <b>Weight (lb/kg):</b>               | 10 / 4.5                              |
| <b>Number of Batteries:</b>          | Four 12VDC 50Ah (85GXL)               |
| <b>Approximate Backup Time:</b>      | 8 Hours @ 275W load                   |

| LPE and FlexNet ELPM-300 Specifications        |                                  |
|--|----------------------------------|
| <b>Enclosure Dimensions H x W x D (in/mm):</b> | 26 x 16.5 x 12 / 661 x 420 x 305 |
| <b>Enclosure Weight (lb/kg):</b>               | 25 / 11.3                        |
| <b>Material:</b>                               | Exterior Powdercoated aluminum   |
| <b>Number of Batteries:</b>                    | Four 12VDC 17Ah                  |
| <b>Door and Lid Seal:</b>                      | Poron gasketing                  |
| <b>Approx. Backup Time:</b>                    | 4 Hours at 250W load             |

| PMR and GMR Series Specifications              |  |
|--|--|
| <b>PMR-S1 Dimensions H x W x D (in/mm):</b>    | 32.2 x 26 x 19.25 / 818 x 660 x 489  |
| <b>Weight (lb/kg):</b>                         | 40 / 18  |
| <b>GMR-S1 Dimensions H x W x D (in/mm):</b>    | 31 x 27.5 x 20 / 787 x 699 x 508   |
| <b>Weight (lb/kg):</b>                         | 49 / 22  |
| <b>PMR-S2 Dimensions H x W x D (in/mm):</b>    | 37 x 30 x 19.25 / 940 x 762 x 489  |
| <b>Weight (lb/kg):</b>                         | 47 / 21  |
| <b>GMR-S2 Dimensions H x W x D (in/mm):</b>    | 38 x 31 x 20 / 965 x 787 x 508   |
| <b>Weight (lb/kg):</b>                         | 63 / 29  |
| <b>Number of Batteries:</b>                    | Four 12VDC 50Ah (85GXL)  |
| <b>Approximate Backup Time:</b>                | 8 Hours at 275W load   |
| <b>PMR Series Enclosure Mounting and Door:</b> | Galvanized steel brackets for wood, and concrete pole mount and wall mount   |
| <b>GMR Series Enclosure Mounting and Door:</b> | Precast polymer concrete pad or PS-6/PS-6XL pedestal systems   |
| <b>Fiber Strain Relief Tie Bar Optional:</b>   | 19" mounting provides ability to strain relief fiber cable plugged into the front of communications equipment                              |
| <b>Splice Tray:</b>                            | Splice Tray Kit (12 count), includes Splice tray with Elastomer Splice Block, Felt Tape, Tie Wraps, Cover and Recording Label              |
| <b>Fiber Management Panel:</b>                 | Provides fiber slack storage and secures a splice tray using a Velcro strap. Tie wrap slots on sides permit securing fiber cables to panel |

LPE and ELPM-300 (300W for MDUs, Dark Spots and Business Parks)



PMR and GMR Series [300W for field deployment of TTx Optical Line Terminal (ONT)]



# Radium MiniBay

## Environmentally Controlled Enclosures



- Scalable, environmentally controlled enclosure system
- Fully integrated and agency certified system
- Ideal for remote optical transition applications
- High capacity 24 or 48VDC 3000BTU (879W) DC powered air conditioner
- Natural gas or propane DC generator system supports critical communications
- Reduces operational and recurring costs

The Radium MiniBay is a modular, highly configurable Telecom grade enclosure system including fully scalable power to 4,000W and 1240Ah of battery capacity with ample rack space for communications electronics. The MiniBay system benefits from more than 30 years of Alpha's Outside Plant (OSP) powering experience. The MiniBay integrates Alpha's comprehensive line of power solutions for today's complex Hub and environmentally controlled enclosure requirements including Alpha's AC UPS, Cordex™ rectifiers, and the AlphaGen™ series of telephony-grade DC generators. Radium MiniBay features include: front and rear accessible 19" or 23" equipment racks providing up to 46 rack mount spaces, durable powdercoated aluminum construction. Battery storage modules are isolated from the equipment section each supporting up to four 155Ah batteries for a 19A load for 8hrs. Typical CSA-NRTL marked configurations include integrated AC service entrance, surge protection, AC distribution, DC distribution, standby generator interface, heat exchanger, fan/filter or air conditioner thermal management, rectifiers or AC UPS equipment.

| Standards                    |  |
|------------------------------|--|
| <b>Environmental Rating:</b> | NEMA 3R when configured with door mounted fans and filter system. NEMA 4X when configured with heat exchanger or air conditioning system |
| <b>Seismic Rating:</b>       | Consult factory. A seismic rating is based on a set system configuration with defined mounting locations and equipment types             |
| <b>Design Standards:</b>     | Following NEC and Telcordia Technologies (Bellcore) GR-487, GR-63 and GR-1089 guidelines   |
| <b>Compliance:</b>           | Third party approval from National Recognized Testing Laboratory (NRTL)  |
| <b>Material:</b>             | High strength corrosion resistant aluminum   |
| <b>Finish:</b>               | Almond color powdercoat finish   |

| Mechanical                     |                 |                                       |
|--------------------------------|-----------------|---------------------------------------|
|                                | Weight (lb/kg): | Dimensions H x W x D (in/mm):         |
| <b>Equipment Enclosure:</b>    | 195 / 88.5      | 44 x 30 x 32 / 1117.6 x 762 x 812.8   |
| <b>Battery Storage Module:</b> | 130 / 59        | 14 x 30 x 32 / 355.6 x 762 x 812.8    |
| <b>Riser Module:</b>           | 102 / 46.3      | 14 x 30 x 32 / 355.6 x 762 x 812.8    |
| <b>Side Chamber SC1:</b>       | 100 / 45.4      | 72 x 32 x 12 / 1828.8 x 812.8 x 304.8 |
| <b>Side Chamber SC2:</b>       | 89 / 40.4       | 72 x 32 x 12 / 1828.8 x 812.8 x 304.8 |

| Fans and Filters   |
|--|
| The most basic thermal management system supporting the MiniBay utilizes conformal-coated, variable speed and alarm monitored fans with electrostatic air filters providing up to 500W thermal dissipation. This configuration has a NEMA 3R rating.   |
| <ul style="list-style-type: none"> <li>• Variable speed controlled DC fans continue to operate during a utility outage</li> <li>• Conformal-coated fans</li> <li>• Electrostatic and washable air filters</li> <li>• Field replaceable fans</li> </ul> |

| Heat Exchanger  |
|---|
| An airtight rear door and a heat exchanger equipped hinged front door providing over 500W thermal dissipation. With a 500W load, the internal ambient temperature will not exceed 9.4 to 2.7°C / 15 to 27°F above external ambient. With a 250W load, the internal ambient temperature will not exceed 7°C / 12.6°F above external ambient. |
| <ul style="list-style-type: none"> <li>• Heat exchanger heat pipe technology provides efficient thermal transfer</li> <li>• Minimizes internal temperature rise above external ambient</li> <li>• Variable speed controlled DC fans continue to operate during a utility outage</li> <li>• Field replaceable fans</li> </ul>                |

| DC Air Conditioner  |
|---|
| For applications requiring the most reliable below cooling and dehumidifying system for supporting seamless performance through extended utility outages. Cooling capacity 878W dissipated at 43°C / 109.4°F outdoor ambient allowing a maximum internal ambient of 40°C / 104°F.   |
| <ul style="list-style-type: none"> <li>• Variable speed brushless motor 24/48VDC compressor system assures optimum efficiency over the full range of thermal loading and ambient temperatures</li> <li>• 3000BTU @ 43°C / 110°F rating</li> <li>• Redundant conformal-coated fans have &gt;50000hrs of life and low voltage disconnect circuitry</li> </ul> |
| AC Air Conditioner  |
| Ideal for applications requiring cooling and dehumidifying with little or no standby runtime performance. Cooling capacity 146W dissipated at 43°C / 109.4°F outdoor ambient allowing a maximum internal ambient of 40°C / 104°F.   |
| <ul style="list-style-type: none"> <li>• 5000BTU @ 43°C / 110°F rating</li> <li>• Washable electrostatic filters</li> <li>• 240VAC</li> </ul>   |



# Flexible Backhaul Enclosure 2322

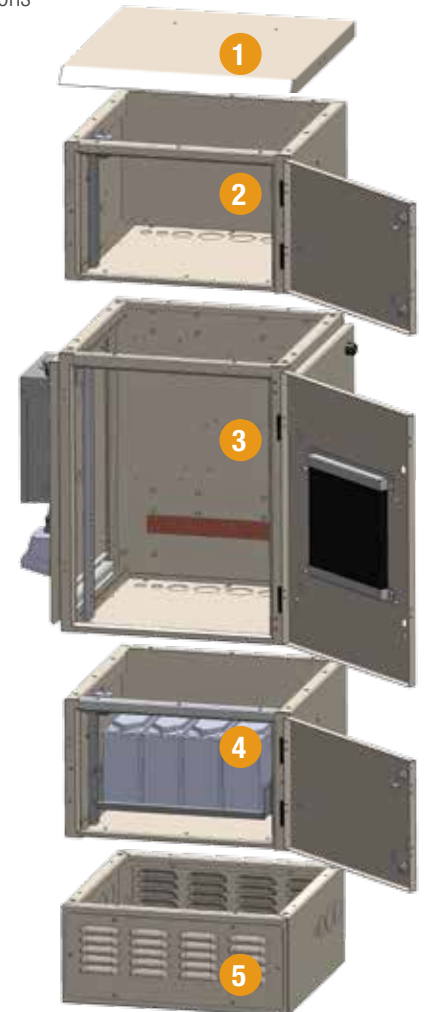
- Provides 15RU for 19" horizontal mounted equipment or 10RU for vertical mounted equipment
- Front and side door access with removable lid
- Durable welded aluminum construction
- Wall, H-Frame, pole or ground mount options
- Multiple thermal management options




| Specifications                      |   |
|-------------------------------------|---|
| Outer Dimensions H x W x D (in/mm): | 29.6 x 27 x 24 / 751.84 x 685.8 x 609.6   |
| Equipment Space:                    | Front to back adjustable 19" 15RU horizontal or 23" 10RU vertical                   |
| Access:                             | Front hinged door, left and right lift off doors, removable lid                     |
| Door Latch/Hinge Type:              | 1/4 turn padlockable / reversible 2 position lift off hinge                         |
| CSA/UL:                             | 60950-22 ITE electrical enclosure   |
| NEMA Rating:                        | Type 3R   |
| System Options                      |   |
| Mounting:                           | Wall, H-Frame, ground or precast mounting pad                                       |
| Thermal:                            | Air conditioner with heater, heat exchanger, fan cooled with variable speed-control |
| Emergency Ventilation System:       | Fan cooled with variable speed-control activated with high temp or HVAC fail alarm  |
| DC Power:                           | 48VDC Cordex HP 1.2kW rectifiers  |
| AC Services Entrances:              | 70A 2 position or 100A 8 position   |
| Generator:                          | External L14-30P generator plug   |
| Alarm:                              | Alarm terminal block  |

## FBE Modular Design

- 1 Enclosure Lid
- 2 Auxiliary Equipment Enclosure
- 3 Base Equipment Enclosure
- 4 Battery Expansion Enclosure
- 5 10" Plinth / Mounting Options
- 6 Climate Control Options



## Enclosure Options

|   |   |
|---|---|
| <b>CordexHP 1.2kW (48VDC Modular Switched Mode Rectifier)</b>                       |   |
|  | <ul style="list-style-type: none"> <li>• Multiple 48V configurations up to 125 Amps for various 48VDC applications</li> <li>• High Efficiency design for increased OpEx savings</li> <li>• High Temperature rated fan-cooled design for harsh outdoor installations</li> </ul>  |
| <b>Cordex 4R/8D ADIO (CXC Smart Peripheral)</b>                                     |   |
|  | <ul style="list-style-type: none"> <li>• Provides additional I/O expansion to existing CXC site controller</li> <li>• Seamless expansion of four relay outputs and eight digital inputs</li> <li>• Ideal for alternate device monitoring and control such as HVAC and generators</li> </ul>   |
| <b>Fuses Panels (Stand-Alone DC Distribution)</b>                                   |   |
|  | <ul style="list-style-type: none"> <li>• 19" and 23" rack mount models</li> <li>• 12, 24 or 48V configurations</li> <li>• Designed for flexible and custom DC distribution</li> </ul>   |
| <b>AlphaCell® (HPL-FT Batteries)</b>  |   |
|  | <ul style="list-style-type: none"> <li>• AGM runtimes up to 160 minutes in outdoor applications</li> <li>• Absorbent Glass Mat (AGM) technology for efficient gas recombination</li> <li>• HPL-FT features front terminal design with protective covers</li> <li>• Specifically designed for mission-critical applications</li> </ul> |

FRONT PANEL  
SERVICE PERSONNEL ONLY



# MODULAR POWER SYSTEM 80HP

ELECTRIC SHOCK  
DANGEROUS  
CHECK ALL  
BEFORE SERVICING  
FOLLOW INSTRUCTIONS  
TO THE SUPPLY  
SYSTEM UNTIL  
ARE FILLED

AC OUTPUT DISTRIBUTION



ON  
OFF

3

# HEADEND / CRITICAL FACILITIES

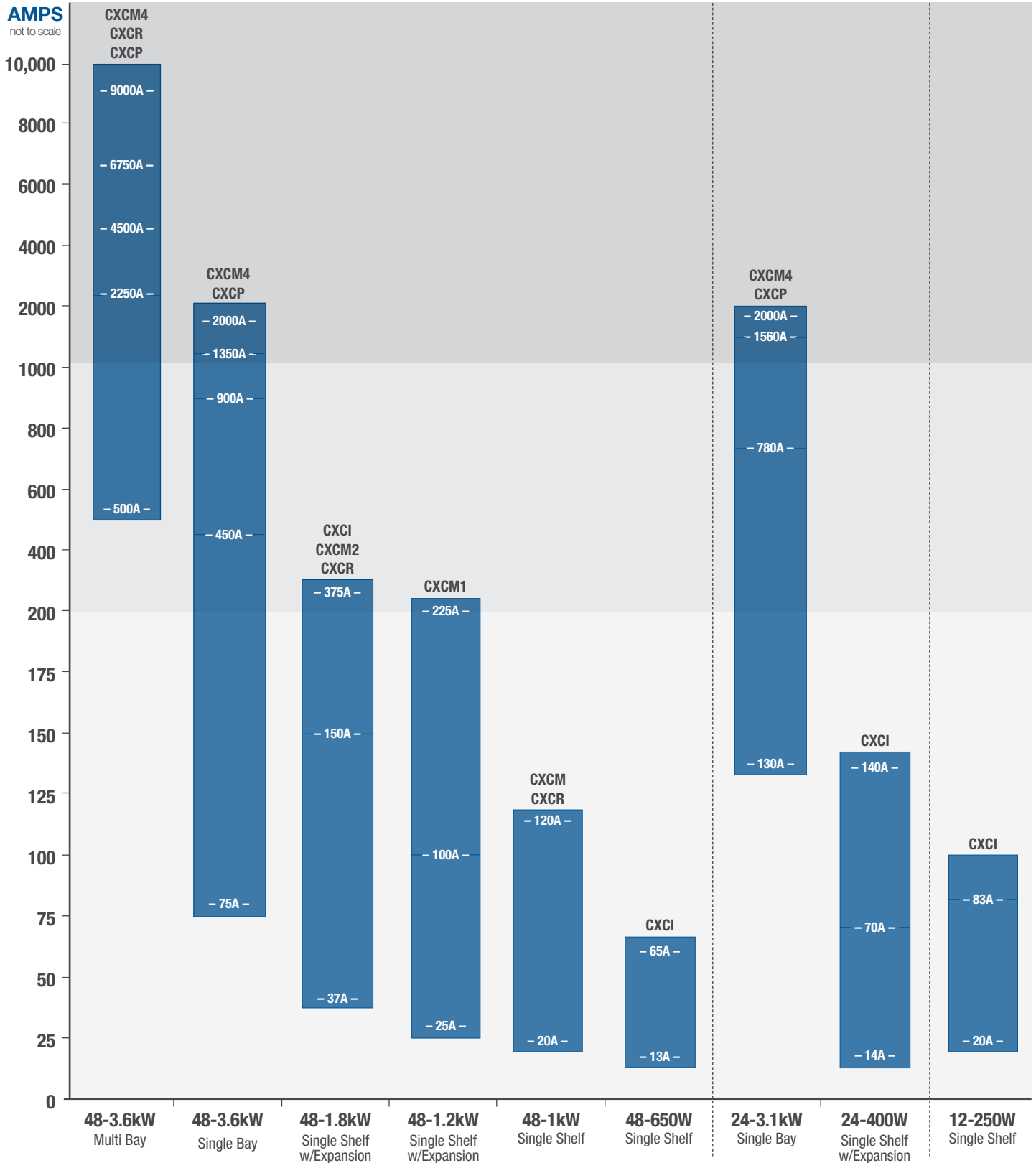
The Alpha Group has more than 20 years of experience in providing a wide variety of fully integrated DC power system solutions. With options for standardized systems and custom DC system integration, we have the flexibility to provide a DC power solution perfect for a wide range of power requirements and various site installation requirements.

- **Cordex™ Power Systems ..... 62-65**
- **Cordex™ 650/400W ..... 66**
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# Cordex™ Power Systems

## Compatibility Matrix



The Cordex CXC is Alpha's latest generation of advanced digital controllers for power system monitoring and control. Cordex supervisory controllers come in a wide array of modular designs for compact integration into Alpha power systems. Stand-alone rack mount versions are also available for DC systems, legacy controller upgrades and site monitoring solutions. A graphic LCD display with state-of-the-art touch-screen interface allows simple and convenient set up, control and monitoring of Cordex rectifiers. Innovative IP technology allows complete configuration and monitoring from any location via the Internet using a standard web browser. Cordex CXC controllers come standard with several advanced battery management features to allow for significant savings of capital and operational expenses. Additional features include user definable alarms with custom algorithms, digital and analog input monitoring, data logging, integrated SNMP and highly reliable CAN bus communications. Software upgrades are easily downloaded and provided free of charge.

## ➤ Main

**Web based GUI Interface:** Web browser support for local or remote control and monitoring

Single point set up and control

Auto voltage adjustment and load sharing

Analog digital inputs

Configurable Form C relay outputs

Various preset alarms and ability to configure up to 20 customized alarms

User programmable logic statements

**Legacy Power System Upgrade:** Controls legacy Pathfinder-based systems and can be used as a site monitor for any 3rd party DC power system.

**CAN Communications:** Common platform for Alpha power electronics and peripherals. Rugged and field proven protocol.

**Fail Safe System Operation:** In the event of CXC failure, rectifiers continue to run with default settings, fail alarm is generated and LVDs (if equipped) remain energized.

**Power Save Function:** Improves operational efficiency by running the minimum number of rectifier modules required per system load.

**System Start Delay:** Allows delay for other AC powered equipment to start before rectifiers.

**Ramp Test Control:** Disables fail alarm on no-load conditions.

**SNMP Support:** Network management service support for managing multiple systems in a single network.

Email notifications via TCP/IP.

**Cordex Peripheral Support:** Optional add-ons for individual cell and temperature monitoring and controller I/O expansion.

Multi language support including Chinese characters.

## ➤ Battery Management

**Temperature Compensated Float Voltage:** Increases voltage in temperatures below 25°C / 77°F and decreases charge voltage above 25°C / 77°F. Maximizes life and capacity of battery and prevents thermal runaway.

**Battery Equalize:** Manual, automatic and periodic equalize charge modes. Optional Battery Current Terminate function to prevent over charging of battery.

**Battery Boost Mode:** Offline high-voltage equalize charge with interlock safety feature.

**Dynamic Charge Current Control:** Limits battery recharge current to a fixed value. Helps prevent thermal runaway.

**Battery Test:** Sets rectifier voltage low and performs safe discharge of batteries through the connected system loads.

**Battery Capacity Prediction:** Calculates current battery capacity after a discharge.

**Battery Runtime Prediction:** Based on current battery capacity and system load.

**Battery Logging:** Retain up to 40 records of battery statistics and events.

## ➤ Maintenance

**Data Logger:** Record any system input(s), and set sample rate of record on deviation. Store up to 500 events via manual or auto start/stop.

**Typical data log applications:** Detailed battery discharge info, AC voltage watch dog and outdoor cabinet thermal performance.

**Easy Remote Software Upgrades:** Fail-safe protected upgrades for controllers, rectifiers and peripherals.

# Cordex™

## Comparison Chart

| Model                                      | CXCR/CXCP                             | CXCM4                                | CXCM2                                | CXCM1                                      | CXCM                                 | CXCI                                  |
|--|---------------------------------------|--------------------------------------|--------------------------------------|--|--------------------------------------|---------------------------------------|
| <b>Specifications</b>                      |                                       |                                      |                                      |  |                                      |                                       |
| <b>Screen:</b>                             | Full Graphic LCD<br>160 x 160 pixels  | Full Graphic LCD<br>160 x 160 pixels | Full Graphic LCD<br>160 x 160 pixels | Basic Current /<br>Volts Display Only      | Full Graphic LCD<br>160 x 160 pixels | Basic Current /<br>Volts Display Only |
| <b>Inputs</b>                              |                                       |                                      |                                      |  |                                      |                                       |
| <b>Analog:</b>                             | 2V, 2T, 4C, 2BIV                      | 2V, 2T, 4C, 2BIV                     | 1V, 2T, 2C, 4BIV                     | 1V, 1C, 2T                                 | 2V, 2T, 1C, 1BIV                     | 1V, 1C, 2T                            |
| <b>Digital:</b>                            | 8                                     | 4                                    | 6                                    | 2  | 3                                    | 2                                     |
| <b>Alarm Relay Outputs:</b>                | 8 Form C                              | 8 Form C                             | 6 Form C                             | 4 Form C                                   | 8 Form C                             | 4 Form C                              |
| <b>Dimensions</b>                          |                                       |                                      |                                      |  |                                      |                                       |
| <b>H x W x D (in/mm):</b>                  | 5.1 x 16.9 x 3.9 /<br>131 x 431 x 100 | 7 x 3.4 x 10.1 /<br>177 x 87 x 257   | 3.4 x 5 x 9.7 /<br>86.4 x 128 x 247  | 1.6 x 33.4 x 10.1 /<br>41.4 x 84.4 x 256.8 | 6.9 x 2.9 x 10 /<br>177 x 74 x 255   | 3.5 x 1 x 11 /<br>88 x 26 x 280       |
| <b>Rectifier shelf option availability</b> |                                       |                                      |                                      |  |                                      |                                       |
| <b>4kW HP (48VDC):</b>                     | Yes                                   | Yes                                  |                                      |  |                                      |                                       |
| <b>3.6kW (48VDC):</b>                      | Yes                                   | Yes                                  |                                      |  |                                      |                                       |
| <b>2kW HP (48VDC):</b>                     | Yes                                   |                                      | Yes                                  |  |                                      | Yes                                   |
| <b>1.8kW (48VDC):</b>                      | Yes                                   |                                      | Yes                                  |  |                                      | Yes                                   |
| <b>1.2kW HP (48VDC):</b>                   |                                       |                                      |                                      | Yes  |                                      |                                       |
| <b>1kW (48VDC):</b>                        | Yes                                   |                                      |                                      |  | Yes                                  |                                       |
| <b>650W (48VDC):</b>                       |                                       |                                      |                                      |  |                                      | Yes                                   |
| <b>400W (24VDC):</b>                       |                                       |                                      |                                      |  |                                      | Yes                                   |



Cordex Controllers come standard with several advanced battery management features to allow for significant capital and operational expense savings. Some additional features include user definable alarms with custom algorithms, digital and analog input monitoring, data logging, integrated SNMP and CAN bus communications. The Cordex CXC is designed for effortless operation of the Cordex rectifier family, making time consuming and complicated DC power system setup a thing of the past.

### CXCM4



LCD touch-screen user interface, internet ready, integrated SNMP, high reliability CAN bus communication, user definable alarms, flexible battery management features, smart peripheral monitoring features, 4RU modular CXC for 3.1/3.6kW Rectifiers.

### CXCM



LCD touch-screen user interface, internet ready, integrated SNMP, high reliability CAN bus communication, user definable alarms, flexible battery management features, 4RU modular CXC for 1kW Rectifiers.

### CXCM2



LCD touch-screen user interface, integrated SNMP, high reliability CAN bus communication, user definable alarms and data logging, flexible battery management features, smart peripheral monitoring features, modular controller for 1.8kW Rectifiers .

### CXCI



Control and monitor via Internet Explorer browser, integrated SNMP, high reliability CAN bus communication, user definable alarms and data logging, flexible battery management features, smart peripheral monitoring features, integrated controller for 2RU Rectifiers.

### CXCR/CXCP



LCD touch-screen user interface, Internet ready integrated SNMP, high reliability CAN bus communication, user definable alarms and data logging, flexible battery management features, smart peripheral monitoring features, 19/23' universal rack or panel mount configurations.

### Cordex 4R/8D ADIO



Provides I/O to Cordex controllers, additional four relay alarm outputs, additional eight digital inputs, connects via standard CAN communication interface, programmable and adjustable via CXC interface.

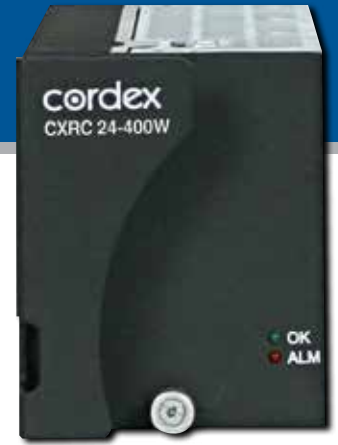
### CXCM1



Internet ready, integrated SNMP, modular, hot-swappable site controller for 1.2kW HP Rectifier, advanced battery monitoring, user definable alarms and data logging, horizontal or vertical mounting.

# Cordex™ 650/400W

## Modular Switched Mode Rectifier



CXRC 24-400W

- 54A system capacity @ 48VDC
- Integrated DC distribution with optional LVD
- Cordex CXCI controller with ethernet and SNMP
- Dual battery string terminations
- Natural convection cooled

### Cordex 650W Rectifier Module

| Electrical Input voltage (120VAC Model)                  |  |
|--|--|
| Operating Input Voltage:                                 | 90 to 140VAC (output power 650W)   |
| Extended Input Voltage:                                  | 90 to 70VAC (derated output power)   |
| Power Output:  | 650W at nominal 120VAC   |
| Electrical Input voltage Universal (100 to 240VAC Model) |  |
| Operating Input Voltage:                                 | 176 to 320VAC (output power 650W)  |
| Extended Input Voltage:                                  | 176 to 90VAC (derated output power)  |
| Operating Input Voltage:                                 | 100 to 140VAC (output power 500W)  |
| Power Output:  | 650W at nominal 208 to 240VAC and 500W at nominal 120VAC                                 |
| Input Frequency:   | 45 to 70Hz   |
| Power Factor:  | >99%   |
| THD:   | <5%  |
| Efficiency:  | >91% (1% loss for 120VAC model)  |
| Output Voltage:  | 42 to 58VDC  |
| Output Current:  | 12A @ 54VDC (13.5A maximum)  |
| Load Regulation:   | <b>Static:</b> <±0.5%<br><b>Dynamic:</b> <±2% for 50 to 100% load step 2ms recovery time |
| Line Regulation:   | <b>Static:</b> <±0.1%<br><b>Dynamic:</b> <±1% for any change within rated limits         |
| Noise  |  |
| Wide Band Noise:   | <30mVrms, <150mVp-p  |
| Psophometric Noise:                                      | <1mV   |

### Cordex 400W Rectifier Module

| Electrical          |   |
|---------------------|---|
| Input Voltage:      | 90 to 320VAC  |
| Power Output:       | 400W  |
| Input Frequency:    | 45 to 70Hz  |
| Power Factor:       | >99%  |
| THD:                | <5%   |
| Efficiency:         | >90%  |
| Output Voltage:     | 20 to 29VDC   |
| Output Current:     | 14A @ 27VDC (14A max.)  |
| Load Regulation:    | <b>Static:</b> <±0.5%<br><b>Dynamic:</b> <±2% for 50 to 100% load step .2ms recovery time |
| Line regulation:    | <b>Static:</b> <±0.1%<br><b>Dynamic:</b> <±1% for any change within rated limits          |
| Noise               |   |
| Wide Band Noise:    | <30mVrms, <150mVp-p   |
| Psophometric Noise: | <1mV  |

### Cordex 650/400W Specifications

| Mechanical                         |   |
|------------------------------------|---|
| Dimensions (in/mm):                | 3.4 x 2.8 x 9.5 / 88.4 x 71.6 x 242   |
| Weight (lb/kg):                    | 3/1.4   |
| Features                           |   |
| Indicators:                        | <b>Green LED:</b> AC mains OK, <b>Red LED:</b> Module alarm   |
| Cooling:                           | Natural convection  |
| Adjustments (via CXCI Controller): | <ul style="list-style-type: none"> <li>• Float and equalize voltage</li> <li>• Battery test voltage</li> <li>• High and low voltage alarms</li> <li>• High voltage shutdown</li> <li>• Current limit</li> <li>• Start delay time</li> <li>• Slope %</li> </ul>  |
| Protection:                        | <ul style="list-style-type: none"> <li>• Current limit/short circuit</li> <li>• Input/output fuses</li> <li>• Output high voltage shutdown</li> <li>• Output power limiting</li> <li>• Thermal foldback/shutdown</li> <li>• Input transient</li> <li>• AC low line foldback/shutdown</li> <li>• AC high voltage shutdown</li> </ul> |
| Environmental                      |   |
| Operation Temperature:             | -40 to 50°C / -40 to 122°F (power derated up to 70°C / 158°F)   |
| Storage Temperature:               | -40 to 85°C / -40 to 185°F  |
| Humidity:                          | 0 to 95% non-condensing   |
| Elevation:                         | -500 to 3000m / -1640 to 9840ft   |
| Heat dissipation:                  | <94BTU per hour   |
| Standards                          |   |
| Safety:                            | <ul style="list-style-type: none"> <li>• CSA C22.2 No 60950-1-03</li> <li>• UL 60950-1 1st Edition</li> <li>• CE marked</li> <li>• IEC/EN 60950-1</li> </ul>  |
| EMC:                               | • ETSI 300 386  |
| Emissions:                         | <ul style="list-style-type: none"> <li>• CFR47 (FCC) Part 15 Class B</li> <li>• ICES-03 Class B</li> <li>• EN55022 (CISPR 22) Class B</li> <li>• C-Tickk (Australia)</li> <li>• EN 61000-3-2</li> <li>• EN 61000-3-3</li> </ul>   |
| Immunity:                          | <ul style="list-style-type: none"> <li>• EN 61000-4-2</li> <li>• EN 61000-4-3</li> <li>• EN 61000-4-4</li> <li>• EN 61000-4-5</li> <li>• EN 61000-4-6</li> <li>• EN 61000-4-11</li> <li>• ANSI/IEEE C62.41 Cat B3</li> </ul>  |

# Cordex™ 400 and 650W

## Rectifier Shelf Systems

- Integrated 48VDC shelf power systems up to 2.6kW
- Bulk 48VDC power systems up to 3.2kW
- 19/23" and 23" rack mounting solutions
- Designed for CSA, UL, CE, FCC and C-Tick standards



Cordex 48V 2.6kW Shelf Power System



Cordex 24V 1.6kW Shelf Power System

| Cordex 48-650W Rectifier Shelves        |                  |             |  |             |
|---|------------------|-------------|--|-------------|
|   | Rectifiers       | Controllers | Distribution                               | Part Number |
| 19" 2RU<br>Flush Mount                  | 4 x CXRC 48-650W | 1 x CXCI    | (4) AM bullet type breakers                | 030-728-20  |
| 19" 2RU<br>Flush Mount                  | 5 x CXRC 48-650W | 1 x CXCI    | Bulk power for external distribution panel | 030-782-20  |
| 23" 2RU<br>Centre Mount<br>Front Access | 4 x CXRC 48-650W | 1 x CXCI    | (4) AM bullet (10) GMT fuse                | 030-722-20  |

| Cordex 24-400W Rectifier Shelves |                  |             |  |             |
|----------------------------------|------------------|-------------|--|-------------|
|                                  | Rectifiers       | Controllers | Distribution                               | Part Number |
| 19" 2RU<br>Flush Mount           | 4 x CXRC 24-400W | 1 x CXCI    | (4) AM bullet type breakers                | 030-763-20  |
| 19" 2RU<br>Flush Mount           | 5 x CXRC 24-400W | 1 x CXCI    | Bulk power for external distribution panel | 030-773-20  |

### 19/23" Shelf Systems

|  |  |
|--|--|
|  | Cordex 48V 2.6kW shelf power system with CXCI controller and bullet breaker distribution.            |
|  | Cordex 48V 3.2kW bulk power system with CXCI controller, optional LVD shunt with battery breaker.    |
|  | Cordex 48V 2.6kW front access shelf power system with CXCI controller and breaker/fuse distribution. |
|  | Cordex 24V 1.6kW shelf power system with CXCI controller and bullet breaker distribution.            |
|  | Cordex 24V 2kW bulk power system with CXCI controller.   |

### 19" Shelf Systems

| Mechanical          |                                    |
|---------------------|------------------------------------|
| Dimensions (in/mm): | 3.5 x 17.1 x 11.9 / 89 x 435 x 302 |
| Weight (lb/kg):     | 15.5/6.9                           |

### 23" Shelf Systems

| Mechanical          |   |
|---------------------|---|
| Dimensions (in/mm): | 3.48 x 21.42 x 12.0 / 88.4 x 544 x 307<br>(Excludes optional fan tray and baffle) |
| Mounting:           | Center mount; 1.75" and 1" racks  |
| Weight (lb/kg):     | 37 / 16.8 (Fully equipped with four rectifiers)                                   |

| Communication Ports |  |
|---------------------|--|
| CAN:                | Interface to control rectifiers. Smart peripherals |
| Ethernet:           | 10/100 Base-T for TCP/IP/SNMP features.            |

| Environmental |  |
|---------------|--|
| Temperature:  | -40 to 50°C / -40 to 122°F                     |
| Storage:      | -40 to 85°C / -40 to 185°F                     |
| Humidity:     | 0 to 95% non-condensing                        |
| Elevation:    | -500 to 3000m / -1640 to 9840ft                |
| Cooling:      | Natural or forced convection, vertical airflow |

| Standards                |  |
|--------------------------|--|
| Safety:                  | <ul style="list-style-type: none"> <li>• CSA C22.2 No 60950-1-03</li> <li>• Std. No 60950-01</li> <li>• EN60950</li> </ul> |
| NEBS (Designed to Meet): | GR-1089-CORE, GR-63-CORE   |

# Cordex HP™ 1.2kW

Modular Switched Mode Rectifier

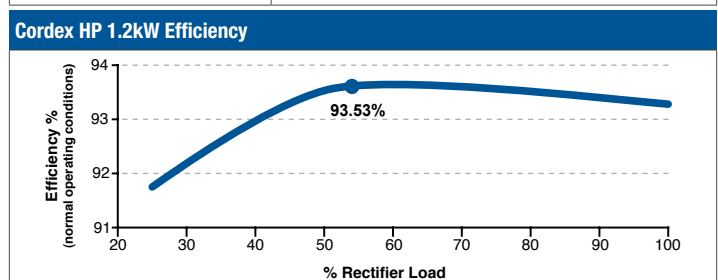


- 93% efficiency for reduced OpEx and carbon footprint
- High temperature operation for installation in harsh outdoor environments
- 1RU x 2RU footprint for flexible and multiple mounting options
- High power density (21.8W/in3) yields more space for revenue generating equipment
- Wide AC input range for a variety of global installation requirements

| Electrical                         |  |
|------------------------------------|--|
| Nominal Input Voltage:             | 176 to 276VAC  |
| Input Voltage Extended             | Low: 90 to 175VAC (derated output power)<br>High: 277 to 300VAC (derated power factor) |
| Input Current Nominal:             | 7.5A max   |
| Input Current (90 to 132VAC):      | 6A max   |
| Input Frequency:                   | 45 to 70Hz   |
| Power Factor:                      | >99%   |
| THD:                               | <5% @ nominal input voltage  |
| Efficiency:                        | Nominal AC input: >93% 50 to 100% load<br>120VAC input: >90% 40 to 100% load           |
| Output Voltage:                    | 42 to 58VDC  |
| Output Power (Nominal AC Input):   | 1200W  |
| Output Power (110 to 132VAC):      | 600W (derated linearly to 491W @ 90VAC)  |
| Output Current (Nominal AC Input): | 22.2A @ 54V (25A max @ 48V)  |
| Output Current (110 to 132VAC):    | 12.5A max (derated linearly to 10.2A @ 90VAC)  |
| Load Regulation:                   | Static: <±0.5%<br>Dynamic: <±1% for 40 to 90 to 40% load step, 2ms recovery time       |
| Line Regulation:                   | Static: <±0.1%<br>Dynamic: <±1% for any change within rated limits                     |
| Noise                              |  |
| Web Band:                          | <30mVrms, <150mV pk to pk  |
| Psophometric:                      | <2mV   |
| Mechanical                         |  |
| Dimensions H x W x D (in/mm):      | 1.63 x 3.34 x 10.11 / 41.4 x 84.8 x 256.8  |
| Weight (lb/kg):                    | 2.7 / 1.2  |
| Environment                        |  |
| Operation Temperature:             | -40 to 65°C / -40 to 149°F (power derated up to 80°C / 176°F)                          |
| Storage Temperature:               | -40 to 85°C / -40 to 185°F   |
| Humidity:                          | 0 to 95% non-condensing  |
| Elevation:                         | -500 to 3000m / -1640 to 9840ft  |
| Heat Dissipation:                  | <308BTU per hour   |

| Features                          |   |
|-----------------------------------|---|
| Indicators:                       | Green LED: AC mains OK / DC output OK<br>Red LED: Module alarm  |
| Cooling:                          | Fan cooled  |
| Adjustments (Via CXC Controller): | <ul style="list-style-type: none"> <li>• Float and equalize voltage</li> <li>• Battery test voltage</li> <li>• High and low voltage alarms</li> <li>• High voltage shutdown</li> <li>• Current limit</li> <li>• Start delay time</li> <li>• Slope %</li> </ul>  |
| Protection:                       | <ul style="list-style-type: none"> <li>• Current limit/short circuit</li> <li>• Input/output fuses</li> <li>• Output high voltage shutdown</li> <li>• Output power limiting</li> <li>• Thermal foldback/shutdown</li> <li>• Input transient</li> <li>• AC low line foldback/shutdown</li> <li>• AC high voltage shutdown</li> </ul> |

| Standards       |  |
|-----------------|--|
| Safety:         | <ul style="list-style-type: none"> <li>• CSA C22.2 No 60950-1-03</li> <li>• CE marked</li> </ul>   |
| EMC:            | ETSI 300 386   |
| Emissions:      | <ul style="list-style-type: none"> <li>• CFR47 (FCC) Part 15 Class B</li> <li>• ICES-03 Class B</li> <li>• EN55022 (CISPR 22) Class B</li> <li>• C-Tick (Australia)</li> <li>• EN 61000-3-2</li> <li>• EN 61000-3-3</li> </ul> |
| Immunity:       | <ul style="list-style-type: none"> <li>• EN 61000-4-2</li> <li>• EN 61000-4-3</li> <li>• EN 61000-4-4</li> <li>• EN 61000-4-5</li> <li>• EN 61000-4-6</li> <li>• EN 61000-4-11</li> <li>• ANSI/IEEE C62.41 Cat B3</li> </ul>   |
| NEBS/Telcordia: | <ul style="list-style-type: none"> <li>• GR-1089-CORE</li> <li>• GR-63-CORE</li> </ul>   |



# Cordex HP™ 2.4kW

## Modular Switched Mode Rectifier



- High efficiency (>96%) for reduced OpEx and carbon footprint
- High temperature operating range for installation in non-controlled environments
- Multiple 48V configurations up to 250A in a compact 1RU shelf system
- Industry leading power density (28W/in<sup>3</sup>) yields more space for revenue generating equipment
- Wide AC input operating range for global installation requirements

| Electrical               |   |
|--------------------------|---|
| Nominal Input Voltage:   | 187 to 277VAC   |
| Input Operating Voltage: | 187 to 310VAC   |
| Input Extended Voltage:  | 90 to 187VAC (derated power)                                    |
| Input Frequency:         | 45 to 66Hz  |
| Power:                   | 2400W continuous (1200W output @120VAC input)                   |
| Power Factor:            | >0.99 (50 to 100% load)   |
| THD:                     | <5%   |
| Efficiency:              | >96%  |
| Output Voltage:          | 44 to 58VDC   |
| Output Current:          | @ 48VDC: 44.5A @ 54VDC 50A max.<br>@ 120VAC input: ~25A @ 48VDC |
| Load Regulation:         | <±0.5% (static)   |
| Line Regulation:         | <±0.1% (static)   |
| Transient Response:      | ±2% for 40 to 90% load step                                     |

| Noise         |   |
|---------------|---|
| Voice Band:   | <38dBmC   |
| Web Band:     | 10kHz to 10MHz: <20mV RMS<br>10kHz to 100MHz: <100mV pk to pk |
| Psophometric: | <1mV RMS  |
| Acoustic:     | <60dBa @ 1m / 3ft, 55°C / 131°F                               |

| Mechanical                    |                                   |
|-------------------------------|-----------------------------------|
| Dimensions H x W x D (in/mm): | 1.6 x 4.1 x 13.1 / 41 x 104 x 333 |
| Weight (lb/kg):               | 3.9 / 1.76                        |

| Environment            |   |
|------------------------|---|
| Operating Temperature: | -40 to 55°C / -40 to 131°F                                    |
| Extended Temperature:  | -40 to 75°C / -40 to 167°F derated power 2000W @ 65°C / 149°F |
| Storage Temperature:   | -40 to 85°C / -40 to 185°F                                    |
| Humidity:              | 0 to 95% non-condensing                                       |
| Heat Dissipation:      | <430BTU per hour  |


| Standards       |  |
|-----------------|--|
| Safety:         | CSA C22.2 No 60950-1-03, CE marked   |
| EMC:            | ETSI 300 386   |
| Emissions:      | CFR47 (FCC) Part 15 Class B, EN 61000-3-12, EN 61000-4-3, EN 6100-3-3  |
| Immunity:       | EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, ANSI/IEEE C62.41 Cat B3 |
| NEBS/Telcordia: | GR-1089-CORE, GR-63-CORE   |

### Cordex 48-2.4kW Rectifier Shelves

#### 23" 1RU Universal Mount 12,000W

|  |                                      |
|--|--------------------------------------|
|  |                                      |
| Rectifiers:  | 4 x CXRF HP 48-2.4kW                 |
| Distribution:  | Bulk power for external distribution |
| Dimensions H x W x D (in/mm):  | 1.75 x 17.3 x 16.6 / 44 x 438 x 420  |
| Weight (lb/kg):  | 12.6 / 5.7                           |

#### 19" 1RU Universal Mount 9,600W

|   |   |
|---|---|
|  |   |
| Rectifiers:   | 4 x CXRF HP 48-2.4kW                                  |
| Distribution:   | Bulk power for external distribution                  |
| Dimensions H x W x D (in/mm):   | 1.75 x 17.3 x 16.6 / 44 x 438 x 420                   |
| CAN Communications Ports:   | Interface to control rectifiers and smart peripherals |
| Ethernet:   | 10/100 Base-T for TCP/IP/SNMP features                |

#### Standard 48VDC Power System



# Cordex HP™ 4kW

Modular Switched Mode Rectifier

- Near 95% efficiency for reduced OpEx and carbon footprint
- Available in 75A @ 48VDC
- High power density, over 23kW per 23" shelf
- Power limiting and wide range AC input
- Hot-swappable, 4RU ultra compact design
- Backwards compatibility with Cordex 3.6kW rectifier shelves and power solutions providing cost effective upgrade path



| Electrical                           |   |
|--------------------------------------|---|
| Nominal Input Voltage:               | 208 to 277VAC   |
| Operating Input Voltage:             | 187 to 312VAC   |
| Extended Input Voltage:              | 187 to 90VAC (derated power)  |
| Input Frequency:                     | 45 to 66Hz  |
| Power Factor:                        | >0.99 (50 to 100% load)   |
| THD:                                 | >5% (@ 208VAC)  |
| Efficiency:                          | >94.9% peak   |
| Output Voltage:                      | 42 to 60VDC   |
| Power Output:                        | 4000W continuous/module   |
| Float Voltage:                       | 48 to 58VDC   |
| Output Current:                      | 74A @ 54VDC (83.3A max 48V)   |
| Load Regulation:                     | <±0.5% (static)   |
| Line Regulation:                     | <±0.1% (static)   |
| Transient Response:                  | ±3% for 40 to 90% load step   |
| Noise                                |   |
| Voice Band:                          | <38dBmC   |
| Wide Band:                           | 10kHz to 10MHz: <20mVrms<br>10kHz to 100MHz: <150mV pk to pk  |
| Psophometric:                        | <2mV  |
| Acoustic:                            | <60dBA @ 1m / 3ft   |
| Mechanical                           |   |
| Dimensions H x W x D (in/mm):        | 6.3 x 3.4 x 11.8 / 160 x 87 x 300   |
| Weight (lb/kg):                      | 9 / 4.6   |
| Features                             |   |
| Indicators:                          | Green LED: AC mains OK / Module OK<br>Red LED: Module fail  |
| Controls:                            | CAN interface to CXC Controller   |
| Adjustments<br>(via CXC Controller): | <ul style="list-style-type: none"> <li>• Float voltage</li> <li>• Equalize voltage</li> <li>• High/Low voltage alarm</li> <li>• High voltage shutdown</li> <li>• Current limit</li> <li>• Slope</li> <li>• Start delay</li> </ul>   |
| Protection:                          | <ul style="list-style-type: none"> <li>• Current limit/short circuit</li> <li>• Start delay</li> <li>• Input/output fuses</li> <li>• Output high voltage shutdown</li> <li>• Power limiting</li> <li>• Thermal foldback/shutdown</li> <li>• Input transient</li> <li>• AC low line foldback/shutdown</li> </ul> |

| Environment                     |  |
|---------------------------------|--|
| Standard Operating Temperature: | -40 to 55°C / -40 to 131°F   |
| Extended Operating Temperature: | -40 to 75°C / -40 to 167°F<br>derated power (~ 3600W @ 65°C / 149°F)   |
| Storage Temperature:            | -40 to 85°C / -40 to 185°F   |
| Humidity:                       | 0 to 95% non-condensing  |
| Elevation:                      | -500 to 4000m / -1640 to 13120ft   |
| Heat dissipation:               | <1150BTU per hour  |
| Standards                       |  |
| Safety:                         | CSA C22.2 No 60950-1-03, UL 60950-1 1st Edition, CE marked, IEC/EN 60950-1   |
| EMC:                            | ETSI 300 386   |
| Emissions:                      | CFR47 (FCC) Part 15 Class B, ICES-03 Class B, EN55022 (CISPR 22) Class B, C-Tick (Australia), EN 61000-3-2, EN 61000-3-3 |
| Immunity:                       | EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, ANSI/IEEE C62.41 Cat B3             |
| NEBS:                           | GR-1089 CORE, GR-63 CORE   |

# Cordex HP™ 12kW

## Modular Switched Mode Rectifier



- 48V high capacity rectifier for CO, MSC, data center and cable headend facilities
- Legacy power system upgrade ready with Cordex controller
- 95% efficiency for reduced OpEx and carbon footprint
- Wide AC input operating range that satisfies a variety of global installation requirements

| Electrical                           |   |
|--------------------------------------|---|
| Nominal Input Voltage:               | 208 to 240VAC: 3PH-3W<br>360 to 480VAC: 3PH-4W  |
| Input Frequency:                     | 45 to 66Hz  |
| Power:                               | 12000W continuous/module  |
| Power Factor:                        | >0.99 (50 to 100% load)   |
| THD:                                 | >5% (@ 208 VAC)   |
| Efficiency:                          | 95% peak @ 277VAC   |
| Output Voltage:                      | 44 to 60VDC   |
| Flood Voltage:                       | 48 to 58VDC   |
| Output Current:                      | 222A @ 54VDC (249A max 48V)   |
| Load Regulation:                     | <±0.5% (static)   |
| Line Regulation:                     | <±0.1% (static)   |
| Transient Response:                  | ±3% for 40 to 90% load step   |
| Noise                                |   |
| Voice Band:                          | <38dBmC   |
| Wide Band:                           | 10kHz to 10MHz: <20mVrms<br>10kHz to 100MHz: <150mV pk to pk  |
| Psophometric:                        | <2mV  |
| Acoustic:                            | <60dBA @ 1m / 3ft   |
| Mechanical                           |   |
| Dimensions H x W x D (in/mm):        | 6.3 x 10.2 x 11.8 / 160 x 261 x 300   |
| Weight (lb/kg):                      | 27 / 12   |
| Features                             |   |
| Indicators:                          | Green LED: AC mains OK / DC mains OK<br>Red LED: Module fail  |
| Controls:                            | CAN interface to CXC Controller   |
| Adjustments<br>(via CXC Controller): | <ul style="list-style-type: none"> <li>• Float voltage</li> <li>• Equalize voltage</li> <li>• High/Low voltage alarm</li> <li>• High voltage shutdown</li> <li>• Current limit</li> <li>• Slope</li> <li>• Start delay</li> </ul>   |
| Protection:                          | <ul style="list-style-type: none"> <li>• Current limit/short circuit</li> <li>• Start delay</li> <li>• Input/output fuses</li> <li>• Output high voltage shutdown</li> <li>• Power limiting</li> <li>• Thermal foldback/shutdown</li> <li>• Input transient</li> <li>• AC low line foldback/shutdown</li> </ul> |

| Environment                     |   |
|---------------------------------|---|
| Standard Operating Temperature: | -40 to 55°C / -40 to 131°F  |
| Extended Operating Temperature: | -40 to 75°C / -40 to 167°F (derated power)<br>~ 10800W @ 65°C / 149°F   |
| Storage Temperature:            | -40 to 85°C / -40 to 185°F  |
| Humidity:                       | 0 to 95% non-condensing   |
| Elevation:                      | -500 to 4000m / -1640 to 13120ft  |
| Heat dissipation:               | <3450BTU per hour   |
| Agency Compliance               |   |
| Safety:                         | <ul style="list-style-type: none"> <li>• CSA C22.2 No 60950-1</li> <li>• UL 60950-1 1st Edition</li> <li>• CE marked</li> <li>• IEC/EN 60950-1</li> </ul>   |
| EMC:                            | ETSI 300 386  |
| Emissions:                      | <ul style="list-style-type: none"> <li>• CFR47 (FCC) Part 15 Class B</li> <li>• ICES-03 Class B</li> <li>• EN55022 (CISPR 22) Class B</li> <li>• C-Tick Australia</li> <li>• EN 61000-3-12</li> <li>• EN 61000-3-3</li> </ul> |
| Immunity:                       | <ul style="list-style-type: none"> <li>• EN 61000-4-2</li> <li>• EN 61000-4-3</li> <li>• EN 61000-4-4</li> <li>• EN 61000-4-5</li> <li>• EN 61000-4-6</li> <li>• EN 61000-4-11</li> <li>• ANSI/IEEE C62.41 Cat B3</li> </ul>  |

### 23" Shelf (2 Modules)

| Mechanical                    |  |
|-------------------------------|--|
| Dimensions H x W x D (in/mm): | 6.9 x 20.8 x 15.3 / 177 x 530 x 389                          |
| Weight (lb/kg):               | 32 / 14.5  |
| Mounting:                     | Fits 23" racks only flush/center mount                       |
| Connections                   |  |
| Input:                        | Box type terminal block, 6 to 16mm <sup>2</sup> (10 to 6AWG) |
| Output:                       | Bus adapters with 3/8" studs on 1" centers                   |
| Chassis Ground:               | Compression lug, 6 to 16mm <sup>2</sup> (10 to 6AWG)         |
| CAN Communication:            | RJ12 offset  |

# CXPS 24—48-i & 48—24-i

DC to DC Converter System

- Integrated 8kW capacity converter system with front access distribution
- Support for small to medium 48VDC loads from a legacy 24V power system or 24VDC loads from 48V power system
- Integrated Cordex CXCI for advanced local and remote monitoring and control
- Internal low voltage shutdown for cost effective integration into existing systems
- Universal 19/23" mounting for flexible installation options into existing racks



CXPS 48—1.8-i Power System shown with 1.8kW rectifiers

## CXPS 24—48-i

| Electrical Input         |  |
|--------------------------|--|
| <b>Voltage:</b>          | 21 to 30VDC  |
| <b>Current</b>           |  |
| <b>System:</b>           | <b>Feed A:</b> <188A @ 24V input (216A max)<br><b>Feed B:</b> <188A @ 24V input (216A max) |
| <b>Converter:</b>        | <94A @ 24V input (108A max)  |
| <b>Efficiency:</b>       | >88% (50 to 100% load @ nominal voltage)   |
| Electrical Output        |  |
| <b>Current</b>           |  |
| <b>System:</b>           | 148A max @ 54VDC   |
| <b>Converter Module:</b> | 37A max @ 54VDC  |
| <b>Power</b>             |  |
| <b>System:</b>           | 8000W max @ 54VDC  |
| <b>Converter Module:</b> | 2000W max @ 54VDC  |

## CXPS 48—24-i

| Electrical Input         |   |
|--------------------------|---|
| <b>Voltage:</b>          | -42 to -60VDC   |
| <b>Current</b>           |   |
| <b>System:</b>           | <b>Feed A:</b> <968A @ -48V input (110A max)<br><b>Feed B:</b> <96A @ -48V input (110A max) |
| <b>Converter:</b>        | <48A @ -48V input (55A max)   |
| <b>Efficiency:</b>       | >88% (50 to 100% load @ nominal voltage)  |
| Electrical Output        |   |
| <b>Current</b>           |   |
| <b>System:</b>           | 296A max @ 27VDC  |
| <b>Converter Module:</b> | 74A max @ 27VDC   |
| <b>Power</b>             |   |
| <b>System:</b>           | 8000W max @ 27VDC   |
| <b>Converter Module:</b> | 2000W max @ 27VDC   |

## CXPS 24—48-i & CXPS 48—24-i Specifications

| Features                              |  |                     |
|---------------------------------------|--|---------------------|
| <b>Configurations</b>                 | <b>CXPS 24—48-i</b>  | <b>CXPS 48—24-i</b> |
| <b>Part Number:</b>                   | 053-997-20-000   | 0530039-001         |
| <b>Mounting:</b>                      | Base system with 19/23" universal mounting   |                     |
| <b>Converter:</b>                     | Up to 4x CXDF 2kW converter positions  |                     |
| <b>Distribution:</b>                  | 18x load breaker positions (mid-trip, plug-in style)   |                     |
| <b>Shunt:</b>                         | Controller: CXCI+ integrated controller  |                     |
| Mechanical                            |  |                     |
| <b>Dimensions H x W x D (in/mm)*:</b> | 8.7 x 17.2 x 12.2 / 222 x 438 x 310  |                     |
| <b>Weight (lb/kg):</b>                | <b>System:</b> 42 / 19<br><b>Rectifier (each):</b> 6.2 / 2.8                                   |                     |
| <b>Mounting:</b>                      | 19/23" universal mount (center or flush)   |                     |
| Connections                           |  |                     |
| <b>Load Breaker:</b>                  | 18x sets, 1/4"-20 studs on 5/8" centers  |                     |
| <b>Return Bar:</b>                    | 18x sets, 1/4" holes on 5/8" centers   |                     |
| <b>Rectifier Input:</b>               | <b>HOT:</b> 2x sets, 3/8" holes on 1" centers<br><b>RTN:</b> 2x sets, 3/8" holes on 1" centers |                     |
| <b>Alarm:</b>                         | Screw terminal 1.31mm <sup>2</sup> to 0.128mm <sup>2</sup> (#16 to #26 AWG)                    |                     |
| <b>CSCI Input:</b>                    | 25-pin D-Sub cable   |                     |
| <b>Access:</b>                        | Front access after installation  |                     |
| Environment                           |  |                     |
| <b>Operating Temperature:</b>         | -40 to 55°C / -40 to 131°F<br>-40 to 65°C / -40 to 149°F derated output                        |                     |
| <b>Humidity:</b>                      | 0 to 95% non-condensing  |                     |
| <b>Elevation:</b>                     | -500 to 2800m / -1640 to 9186ft  |                     |



# CXPS 48-1.8-M2

Standard 48VDC Power System

- Integrated 48V, 292A system package with front access distribution
- High temperature rated fan cooled design for harsh outdoor installations
- Wide range AC input for multiple worldwide AC services
- Modular controller with touch screen display for full local system control
- Flexible ordering options including configurations with racks and battery trays



| Electrical Input       |   |
|------------------------|---|
| Nominal Input Voltage: | 187 to 277VAC (nominal), 187 to 312VAC (operating), 90 to 187VAC (derated output power) |
| Input Current:         | 12A @ 240VAC (per module)   |
| Input Frequency:       | 45 to 66Hz  |
| Efficiency:            | >94.2% peak @ 240VAC  |
| Input Power Factor:    | >.99  |

| Electrical Output |            |   |
|-------------------|------------|---|
| Current           | System:    | 292A max @ nominal I/P<br>182A max @ 120VAC I/P   |
|                   | Rectifier: | 41.7A @ 48VDC (nominal I/P)<br>26A @48VDC (115 to 135VAC)<br>(derated linearly to 18.75A @ 90VAC) |
| Power             | System:    | 14000W max @ nominal I/P<br>8750W @ 120VAC I/P  |
|                   | Rectifier: | 2000W max @ nominal I/P<br>1250W (120VAC)<br>(derated linearly to 900W @ 90VAC)                   |

| Configuration Features |  |
|------------------------|--|
| 053-991-20-000:        | Base system with 19/23" universal mounting   |
| 053-991-20-040:        | System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings   |
| 053-991-20-031         | System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings   |
| Rectifier:             | Up to 7 rectifier positions  |
| Distribution:          | <ul style="list-style-type: none"> <li>• 14x load breaker positions (mid-trip, plug-in style)</li> <li>• 4x battery breaker positions (series-trip, plug-in)</li> <li>• Low voltage disconnect</li> <li>• Shunt</li> </ul> |
| Controller:            | CXCM2 modular controller   |

| Mechanical                     |  |
|--------------------------------|--|
| Dimensions H x W x D (in/mm)*: | 12.25 x 17.24 x 12 / 310.8 x 438 x 305   |
| System Weight (lb/kg):         | 62 / 28  |
| Each Rectifier Weight (lb/kg): | 5.1 / 2.3  |
| Mounting:                      | 19/23" universal mount (center or flush)   |
| Connections                    |  |
| Load Breaker:                  | 14x sets, 1/4"-20 studs on 5/8" centers  |
| Battery Breaker:               | 4x sets, 1/4"-20 studs on 5/8" centers   |
| Return Bar:                    | 18x sets, 1/4" holes on 5/8" centers   |
| Rectifier Input:               | HOT: 2x sets, 3/8" holes on 1" centers<br>RTN: 2x sets, 3/8" holes on 1" centers |
| Alarm:                         | Screw terminal 1.31mm <sup>2</sup> to 0.128mm <sup>2</sup> (#16 to #26 AWG)      |
| CXCM2 Input:                   | 3x DB- style cable connections   |
| Access:                        | Front access after installation  |

| Environment            |   |
|------------------------|---|
| Operating Temperature: | -40 to 55°C / -40 to 131°F<br>-40 to 75°C / -40 to 167°F derated output<br>~1800W @ 65°C /149°F |
| Humidity:              | 0 to 95% non-condensing   |
| Elevation:             | -500 to 2000m / -1640 to 6600ft<br>-500 to 4000m / -1640 to 13100ft with derated output         |

| Components  |  |
|-------------|--|
| 058-156-20: | 23" battery tray expansion kit (for use with -040 configuration) |
| 058-157-20: | 19" battery tray expansion kit (for use with -031 configuration) |
| 470-347-10: | 100A battery breaker   |
| 747-503-20: | 150A battery breaker   |
| 747-504-20: | 250A battery breaker   |

\* -000 configuration: excludes mounting brackets, rear cover and module handle.



TRI-POWER X33 MOD HP

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# AC UPS & BACKUP POWER

Alpha Technologies provides outdoor and indoor AC Uninterruptible Power Supply (UPS) products and solutions for the traffic, parking, security, medical, telecom and DataComm markets. With a wide-range of single and three-phase UPS solutions, Alpha offers power stability, reliability and certainty for critical applications.

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# Outdoor Powering Solutions

Communications and Monitoring

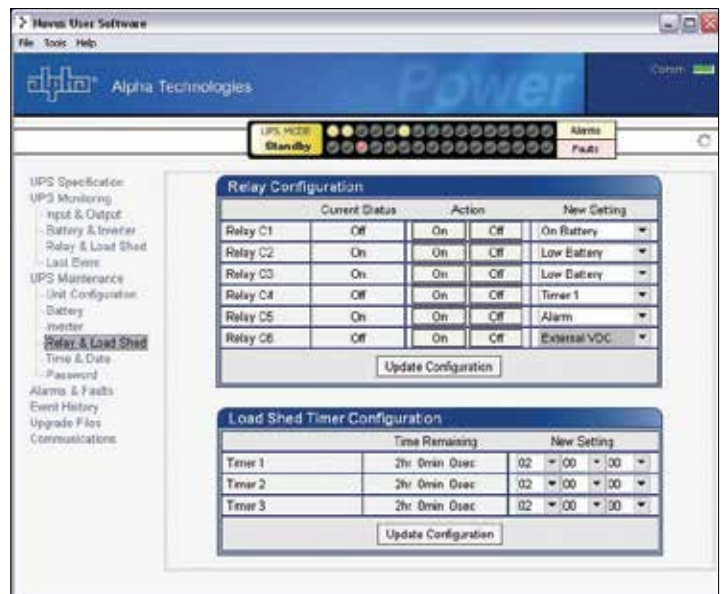
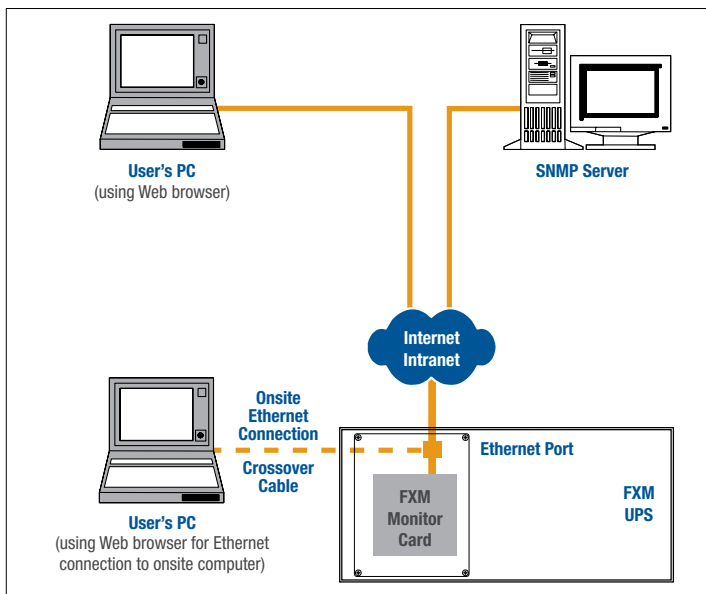
## ► Ethernet/SNMP Card Option – FXM, Micro, Micro Secure

For greater effectiveness, control and communication over your UPS system, choose the Ethernet/SNMP card option that is available for our FXM, Micro and Micro Secure products. The Ethernet/SNMP card is factory installed allowing for communication with the Alpha UPS remotely through a web based interface. The Ethernet/SNMP card is powered by the UPS batteries eliminating the need for an external power source. The communication card is capable of providing notifications to four different email addresses and to devices such as your PC, smartphone or tablet. Outgoing notifications can be customized with selectable severity levels and triggered by events, faults and/or alarms.

## ► User Software

User Software is a graphical user interface (GUI) designed to help Alpha UPS users monitor, control and set various parameters for their UPS systems through a computer using a standard RS-232 connection or through the internet when the UPS is equipped with an Ethernet/SNMP card. Users are able to read and display UPS events, warnings, date, time and relay configurations through this Windows-based environment. The software is an excellent maintenance and troubleshooting tool that automatically updates information every five seconds and records events and warnings with time/date stamps. The UPS event log can be downloaded to your PC via the user interface.

Get real-time notification of every alarm and fault that occurs so that you are immediately in a position to take action. Easy to customize to your exact needs, the Ethernet edition allows you to set your own notification preferences via PC and receive notifications to any PC, mobile phone, PDA, or any device that accepts email.



# Micro Secure 100

Indoor and Outdoor UPS

- All weather protection with durable outdoor NEMA 3R rated plastic enclosure
- Enhanced battery life with wide-range Automatic Voltage Regulation
- Local or remote monitoring and control through RS-232 port or (optional) SNMP Ethernet interface
- Tracking and controlling of key functions through independently programmable relays
- Simplified troubleshooting through event and alarm logging with time and date stamping



| Electrical                       |   |
|----------------------------------|---|
| Battery String Voltage (120VAC): | 24VDC   |
| Battery String Voltage (230VAC): | 24VDC   |
| Input                            |   |
| Nominal Voltage:                 | 230VAC  |
| Nominal Frequency:               | 50Hz  |
| Current:                         | 1A  |
| Voltage Range:                   | 154 to 323VAC   |
| Output                           |   |
| Current:                         | 230VAC: 0.43, 24VDC: 4.2A                             |
| Mechanical                       |   |
| Dimensions H x W x D (in/mm):    | 11.5 x 15 x 6 / 292 x 381 x 152                       |
| Weight w/ Batteries (lb/kg):     | 45 / 20.4   |
| Environmental                    |   |
| Operating Temperature Range:     | -40 to 122°F (-40 to 50°C)                            |
| Audible Noise (@ 25°C):          | 45dBa @ 1m (39in)                                     |
| Performance                      |   |
| Runtime:                         | 2hrs 15min @ full load (using 4x9Ah batteries @ 25°C) |
| Agency Compliance                |   |
| Electrical Safety:               | UL1778, CSA C22.2 No. 107.1                           |
| Marks:                           | CSA, CE (230VAC models only)                          |
| EMI:                             | Class A FCC/CISPR, EN50091-1-2, EN60950               |
| NEMA:                            | 3R  |

# Micro 350

## UPS and Enclosure

- Integrated backup power system designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain up and running during power outages
- 350W/VA total output in AC and/or DC including 120VAC, 24VAC, 48VDC, 24VDC and 12VDC enables application with diverse load requirements
- Temperature compensated battery charging provides longer battery life
- Wide range of input with Automatic Voltage Regulation (AVR) extends battery life by not reverting to batteries during periods of surge or sag in utility power voltages
- External communication via USB port and Ethernet SNMP interface provides local or remote monitoring and control

| Electrical                              | Micro 350   | Micro 350XL  | Micro 350XL3   |
|---|---|--|--|
| <b>Battery String Voltage (120VAC):</b> | 48 or 24VDC   | 48 or 24VDC  | 48 or 24VDC  |
| <b>Battery String Voltage (230VAC):</b> | 24VDC   | 24VDC  | 24VDC  |
| <b>Input (120VAC Models Only)</b>       |   |  |  |
| <b>Nominal Voltage:</b>                 | 120VAC (Voltage range w/o transferring to battery mode: 88 to 152VAC)         |  |  |
| <b>Current:</b>                         | 5.7A  | 6.2A   | 7.2A   |
| <b>Frequency:</b>                       | 60/50Hz ±5% (auto-detection)  | 60/50Hz ±5% (auto-detection)   | 60/50Hz ±5% (auto-detection)   |
| <b>Input (230VAC Models Only)</b>       |   |  |  |
| <b>Nominal Voltage:</b>                 | 230VAC (Voltage range w/o transferring to battery mode: 151 to 282VAC)        |  |  |
| <b>Current:</b>                         | 2.7A  | 3.2A   | 3.6A   |
| <b>Frequency:</b>                       | 60/50Hz ±5% (auto-detection)  | 60/50Hz ±5% (auto-detection)   | 60/50Hz ±5% (auto-detection)   |
| <b>Output (120VAC Models Only)</b>      |   |  |  |
| <b>Waveform:</b>                        | Pure sinewave   | Pure sinewave  | Pure sinewave  |
| <b>Nominal Voltage:</b>                 | Dual 120VAC, 24VAC  | Dual 120VAC, 24VAC   | Dual 120VAC, 24VAC   |
| <b>Voltage Regulation:</b>              | ±10%  | ±10%   | ±10%   |
| <b>Power (@ 50°C):</b>                  | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>120VAC:</b> 350W/VA (max)    | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>120VAC:</b> 350W/VA (max) | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>120VAC:</b> 350W/VA (max) |
| <b>Frequency:</b>                       | Output frequency = Input frequency  | Output frequency = Input frequency   | Output frequency = Input frequency   |
| <b>Output (230VAC Models Only)</b>      |   |  |  |
| <b>Waveform:</b>                        | Pure sinewave   | Pure sinewave  | Pure sinewave  |
| <b>Nominal Voltage:</b>                 | 230VAC, 24VAC   | 230VAC, 24VAC  | 230VAC, 24VAC  |
| <b>Voltage Regulation:</b>              | ±10%  | ±10%   | ±10%   |
| <b>Power (@ 50°C):</b>                  | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>230VAC:</b> 350W/VA (max)    | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>230VAC:</b> 350W/VA (max) | 350W/VA total<br><b>24VAC:</b> 260W/VA (max), <b>230VAC:</b> 350W/VA (max) |
| <b>Frequency:</b>                       | Output frequency = Input frequency  | Output frequency = Input frequency   | Output frequency = Input frequency   |
| <b>Mechanical</b>                       |   |  |  |
| <b>Dimensions H x W x D (in/mm):</b>    | 19.7 x 14.1 x 11.6 / 500 x 358 x 294  | 30.6 x 14.1 x 11.6 / 776 x 358 x 294                                       | 52.4 x 14.1 x 11.6 / 1330 x 358 x 294                                      |
| <b>Weight w/o Batteries (lb/kg):</b>    | 56 / 25   | 65 / 29  | 74 / 33  |
| <b>Environmental</b>                    |   |  |  |
| <b>Operating Temperature Range:</b>     | -40 to 165°F (-40 to 74°C), power derated above 122°F (50°C)                  |  |  |
| <b>Audible Noise (@ 25°C):</b>          | <45dBa @ 1m (39in)  |  |  |
| <b>Performance</b>                      |   |  |  |
| <b>Typical Output Voltage (THD):</b>    | <3%   |  |  |
| <b>Typical Efficiency Line Mode:</b>    | >96%  |  |  |
| <b>Typical Transfer Line:</b>           | <5ms  |  |  |
| <b>Agency Compliance</b>                |   |  |  |
| <b>Electrical Safety:</b>               | UL1778, CSA C22.2 No. 107.3, EN62040-1  |  |  |
| <b>Marks:</b>                           | CSA, CE (230VAC models only)  |  |  |
| <b>EMC:</b>                             | CFR47, Part 15 Subpart B, Class A, CES-003, Issue 4, Class A, EN62040-2: 2006 |  |  |

# Micro 1000

## Outdoor UPS System

- Compact, integrated UPS system provides clean, uninterruptible backup power
- Wide range Automatic Voltage Regulation (AVR) without going to batteries extends battery life, even during periods of surge or sag in voltage from utility power
- External communications via RS-232 port or (optional) Ethernet SNMP interface provides local or remote monitoring control
- Independently programmable control and report relays allow tracking and controlling of key functions
- Event and alarm logging with time and date stamping simplifies and accelerates troubleshooting
- A wide operating temperature range of -40 to 74°C (-40 to 165°F) is suitable for most extreme operating environments
- Temperature compensated battery charging protects batteries from overcharging/undercharging at extreme temperatures

| Electrical (120VAC Model)  |                               |
|----------------------------|-------------------------------|
| Battery String Voltage:    | 48VDC                         |
| Input Voltage:             | 120VAC                        |
| Input Frequency:           | 60Hz                          |
| Input Current:             | 8.8A nominal                  |
| Input Voltage Range:       | 85 to 175VAC                  |
| Output Voltage Regulation: | ±10% over input voltage range |
| Output Power at 50°C:      | 1000W/VA                      |

| Electrical (230VAC Model)  |                               |
|----------------------------|-------------------------------|
| Battery String Voltage:    | 48VDC                         |
| Input Voltage:             | 230VAC                        |
| Input Frequency:           | 50Hz                          |
| Input Current:             | 4.6A nominal                  |
| Input Voltage Range:       | 150 to 328VAC                 |
| Output Voltage:            | 230VAC                        |
| Output Voltage Regulation: | ±10% over input voltage range |
| Output Power at 50°C:      | 1000W/VA                      |

| Performance <sup>1</sup>    |  |
|-----------------------------|--|
| Typical Output Voltage THD: | <3%  |
| Typical Efficiency:         | >98% (resistive load)                      |
| Typical Transfer Time:      | <5ms                                       |
| Runtime <sup>2</sup> :      | 4 x 50Ah batteries - 1hr 14mins (Micro XL) |

| Mechanical                      |                                       |
|---------------------------------|---------------------------------------|
| <b>Alpha Micro</b>              |                                       |
| Dimensions H x W x D (in/mm):   | 19.7 x 14.1 x 11.6 / 500 x 358 x 294  |
| Weight w/out Batteries (lb/kg): | 43 / 19.7                             |
| <b>Alpha Micro XL</b>           |                                       |
| Dimensions H x W x D (in/mm):   | 30.6 x 14.1 x 11.6 / 776 x 358 x 294  |
| Weight w/out Batteries (lb/kg): | 49.8 / 22.6                           |
| <b>Alpha Micro XL3</b>          |                                       |
| Dimensions H x W x D (in/mm):   | 52.4 x 14.1 x 11.6 / 1330 x 358 x 294 |
| Weight w/out Batteries (lb/kg): | 69.2 / 31.4                           |

| Environment            |                            |
|------------------------|----------------------------|
| Operating Temperature: | -40 to 74°C / -40 to 165°F |
| Humidity:              | 15 to 95% non-condensing   |
| Audible Noise @ 25°C:  | <45dBa @ 1 meter (39in)    |

| Agency Compliance <sup>3</sup> |  |
|--------------------------------|--|
| Electrical Safety:             | UL1778, CSA 22.2 No. 107.3, EN50091-1-2, EN60950 |
| Marks:                         | cCSAus, CE <sup>4</sup>                          |
| EMI:                           | Level A FCC, CISPR22, EN55022                    |
| NEMA:                          | 3R   |

<sup>1</sup> This applies to the UPS module only. Batteries may require a heater mat at lower temperatures. Output power derates after 50°C. <sup>2</sup> Runtime on battery power can vary based on loads, temperature and battery. Other battery options are available. <sup>3</sup> Derates after 50°C. <sup>4</sup> CE applies to 230VAC versions only.

# FXM UPS Series

Outdoor UPS with Variable Output



- Clean, uninterruptible backup power
- Wide range Automatic Voltage Regulation (AVR)
- External communications via RS-232 port or (optional) Ethernet SNMP interface
- Independently programmable and dry contact relays allow tracking and controlling of key functions
- Event and alarm logging with time and date stamping
- Control and power connection panels can be rotated for mounting and display
- Temperature compensated battery charging

FXM power modules provide constant, reliable UPS grade backup power management for traffic, security, telecommunications and other applications. The FXM can operate in temperatures of -40 to 74°C / -40 to 165°F supporting your mission critical applications with clean, uninterruptible power. The FXM modules are CSA and UL approved and are adaptable for vertical or horizontal orientations as well as rack mounting. Double buck and double boost is designed into the module to accept a wider input range, providing constant output voltage without switching to system batteries. The FXM's built-in communications intelligence software reports UPS event status, collects valuable planning and maintenance data, and monitors your site through a Windows-based GUI. It also offers a real-time clock for statistical analysis and event diagnostics. An optional SNMP Ethernet interface is available for remote monitoring from virtually any internet-supported location.

| Model                         | FXM 350   | FXM 650                                       | FXM 1100                                      | FXM 2000                                      |
|-------------------------------|---|---|---|---|
| <b>Specifications</b>         |   |   |   |   |
| Battery String Voltage:       | 120VDC: 48 or 24VDC<br>230VDC: 24VDC                    | 120VDC: 48 or 24VDC<br>230VDC: 24VDC          | 48VDC   | 48VDC   |
| Input Nominal Voltage:        | 120VAC: 120VAC, 230VAC: 230VAC                          |   |   |   |
| Frequency:                    | 60/50Hz ±5Hz (auto-detection)                           | Auto-sensing                                  | Auto-sensing                                  |   |
| Input Current:                | FXM350-24: 5.3A, FXM350-48:5.7A,<br>230VAC model: 2.7A  | 120VAC: 5.8A<br>230VAC: 3A                    | 120VAC: 9.8A<br>230VAC: 5.1A                  | 120VAC: 17.9A<br>230VAC: 9.4A                 |
| Input Voltage Range:          | 120VAC: 88 to 152VAC<br>230VAC: 151 to 282VAC           | 120VAC: 85 to 175VAC<br>230VAC: 150 to 328VAC | 120VAC: 85 to 175VAC<br>230VAC: 150 to 328VAC | 120VAC: 85 to 175VAC<br>230VAC: 150 to 328VAC |
| Output Voltage Regulation:    | ±10% over input voltage range                           | ±10% over input voltage range                 | ±10% over input voltage range                 |   |
| Output Power at 50°C / 122°F: | 350W/VA,<br>24VAC: 250VA, 230VAC: 350VA (max.)          | 650W/VA                                       | 1100W/VA                                      | 2000W/VA                                      |
| Frequency:                    | Output frequency = Input frequency                      | Output frequency = Input frequency            | Output frequency = Input frequency            | Output frequency = Input frequency            |
| <b>Mechanical</b>             |   |   |   |   |
| Dimensions H x W x D (in/mm): | 3.5 x 13.5 x 8.3 / 88.1 x 341.9 x 211.7                 | 3.47 x 17 x 9 / 88 x 432 x 229                | 5.22 x 15.5 x 8.75 / 133 x 394 x 222          |   |
| Weight (lb/kg):               | 19 / 8.62   | 25 / 11                                       | 35 / 16                                       | 35 / 16                                       |
| <b>Environmental</b>          |   |   |   |   |
| Operating Temperature**:      | -40 to 74°C / -40 to 165°F                              | -40 to 74°C / -40 to 165°F                    | -40 to 74°C / -40 to 165°F                    | -40 to 74°C / -40 to 165°F                    |
| Audible Noise @ 25°C / 77°F:  | <45dBa @ 1m / 39in.                                     |   |   |   |
| <b>Performance</b>            |   |   |   |   |
| Typical Output Voltage THD:   | <3%   | <3%   | <3%   | <3%   |
| Typical Efficiency:           | >96% (resistive load)                                   | >98% (resistive load)                         | >98% (resistive load)                         | >98% (resistive load)                         |
| Typical Transfer Time:        | <5ms  | <5ms  | <5ms  | <5ms  |
| <b>Agency Compliance</b>      |   |   |   |   |
| Electrical Safety:            | UL1778, CSA 22.2, No 107.3,<br>EN60950-1-2, EN62040-1-2 |   | UL1778, CSA 22.2 No 107.3-03                  |   |
| Marks:                        | CSA / CE  |   | CSA / CE***                                   |   |
| EMI:                          | FCC Part 15/B, EN55022.<br>Class A, EN62040-2           |   | Class A FCC/CISPR [EN 50091-2:1995]           |   |



# CFR Series

Controlled Ferroresonant UPS



- Maximum protection—highest MTBF in the UPS industry
- Complete input to output
- The CFR's microprocessor design provides efficiency ratings up to 92%
- Features a RS-232 communication port and is SNMP and modem compatible
- External Battery Pack available for extended runtimes

| Specifications                   |                             |
|----------------------------------|-----------------------------|
| Operating Input Voltage Range:   | -23 to 10%                  |
| Input Frequency Operating Range: | ±1.4Hz                      |
| Input Power Factor:              | 0.95 to 0.99                |
| Input Current THD:               | 5% typical                  |
| Output Waveform:                 | Pure sinewave               |
| Output Voltage Regulation:       | ±1%                         |
| Typical Output Voltage THD:      | <5% 600VA to 3kVA           |
| Inverter Frequency Stability:    | ±0.1%                       |
| Spike Attenuation:               | 2000 to 1                   |
| Lightning and Surge Protection:  | ANSI C62.41-1980 (IEEE 587) |
| Operating Temperature:           | 0 to 40°C / 32 to 104°F     |
| Audible Noise:                   | 40dBA Typical @ 1m          |

| Communications   |  |
|--|--|
| All Alpha CFR products feature RS-232 communication ports and are SNMP and modem compatible. The following is a list of optional communication, monitoring and control products: |  |
| <b>SNMP Agent:</b> Furnishes real time UPS/power status to the Network Power Management Software.  |  |
| <b>Intelligent Interface Device (I<sup>2</sup>D):</b> Front panel LCD readout provides vital UPS system information at the touch of a key.                                       |  |

| Application Specific Models |   |  |  |  |  |
|-----------------------------|---|--|--|--|--|
| <b>CFR-NT:</b>              | Specifically designed to be compatible with Northern Telecom Meridian telephone switches and other telephony products                       |  |  |  |  |
| <b>CFR-MED:</b>             | Designed for medical or dental equipment or dental equipment power protection. Meets or exceeds the requirement of UL 544 and CSA 22.2 #125 |  |  |  |  |
| <b>CFR-E:</b>               | 50Hz configuration  |  |  |  |  |

| Plug and Receptacle Diagram |   |        |    |                |     |
|-----------------------------|---|--------|----|----------------|-----|
| 5-15P                       | ☺ | 5-15R  | ☹☹ | CS6361         | ☺   |
| 5-30P                       | ☺ | 5-30R  | ☹  | Terminal Block | ☹☹☹ |
| 5-20P                       | ☹ | 5-20R  | ☹  | British        | ☹   |
| 5-50P                       | ☹ | L5-15R | ☹☹ | Schuko         | ☹☺  |
| L5-15P                      | ☹ | L5-20R | ☹  | Australian     | ☹☺  |
| L5-30P                      | ☹ | L5-30R | ☹  |                |     |
| L6-30P                      | ☹ | L6-20R | ☹  |                |     |
|                             |   | L6-30R | ☹  |                |     |

| Models  | CFR 1000, CFR 1000 E  | CFR 1500, CFR 1500 E, CFR 1500 NT  | CFR 5000, CFR 5000 E, CFR 5000 NT                     |
|---|---|--|---|
| Output Power Rating:                          | 1000VA / 750W   | 1500VA / 1000W   | 5000VA / 3750W  |
| <b>60Hz Models (CFR, CFR-NT and CFR-M)</b>    |   |  |   |
| Input/Output Voltage (VAC):                   | 120   | 120 / 208 / 240  | 120 / 208 / 240                                       |
| <b>50Hz Models (CFR-E)</b>                    |   |  |   |
| Input/Output Voltage (VAC):                   | 230   | 230  | 230   |
| Typical Efficiency (AC/AC):                   | 100% load at 90%  | 100% load at 90%   | 100% load at 90%                                      |
| Typical Heat Output (Line Mode):              | 284BTU/h  | 427BTU/h   | 1425BTU/h   |
| <b>Mechanical</b>                             |   |  |   |
| Dimensions H x W x D (in/mm):                 | 10 x 8.5 x 20 / 254 x 216 x 508   | 21 x 8.5 x 22.5 / 533 x 216 x 571  | 22.5 x 12 x 29.4 / 569 x 305 x 747                    |
| 60Hz Weight (lb/kg):                          | 92 / 42   | 151 / 69   | 375 / 170   |
| 60Hz Ship Weight (lb/kg):                     | 97 / 44   | 162 / 73   | 453 / 206   |
| 50Hz Weight (lb/kg):                          | 93 / 42   | 163 / 74   | 381 / 173   |
| 50Hz Ship Weight (lb/kg):                     | 98 / 44   | 174 / 79   | 477 / 216   |
| Internal Battery Runtime:                     | 12min   | 18min  | 12min   |
| Internal Battery Recharge Time (To 80% Cap.): | 5hrs typical  | 5hrs typical   | 5hrs typical  |
| <b>60Hz Power Connector Options</b>           |   |  |   |
| Input (CFR, CFR-C, CFR-M, CFR-RM Models):     | 5-15P   | 5-15P, L5-15P, T. B.   | 5-50P, CS6361, L6-30P <sup>***</sup> , Terminal Block |
| Input (CFR-NT Models):                        | N/A   | L6-30R   | L6-30   |
| Output (CFR, CFR-C, CFR-M, CFR-RM Models):    | 5-15R, L5-15R   | 5-15R, 5-20R, 6-20R, L5-15R, L5-20R, L5-30R, L6-20R, 5-30R, L6-30R, Terminal Block |   |
| Output (CFR-NT Models):                       | N/A   | 5-15R, 2-L6-30R  | 5-15R, 3-L6-30R                                       |
| <b>50Hz Power Connector Options</b>           |   |  |   |
| Input/Output (CFR-E Models):                  | British, Schuko, Australian   |  |   |
| <b>Output Power Connector</b>                 |   |  |   |
| Configuration Options:                        | 1: Any 2 single or 2 duplex receptacles 2: Any combination of 3 or less duplex receptacles 3: Any combination of 2 or less single receptacles<br>4: Any duplex receptacle with any single receptacle 5: Single terminal block |  |   |

Notes: UPS Warranty (24 month limited), battery warranty (24 month limited). \* Battery runtimes are calculated at 100% rated loads and will vary according battery age, loads, temperature and other factors. \*\* Total runtime include the internal batteries and the External Battery Pack (EBP) at 100% load

# Alpha Sentra XL

Line-Interactive Sinewave UPS Series



- Highly efficient Line Interactive Sinewave UPS with 0.9 output power factor
- Optional external battery cabinets with "daisy-chainable" connections and dependable high rate charger provides extended backup and optimal runtime
- Rack/tower convertible design with rotating LCD panel provides compact and flexible form factor
- Advanced Automatic Voltage Regulation (AVR) lengthen battery life
- Hot-swappable battery function facilitates ease of maintenance
- USB and RS232 interfaces, plus customer definable slot, provide additional communication flexibility

| Models                      | Sentra XL<br>1000   | Sentra XL<br>1500   | Sentra XL<br>2200 | Sentra XL<br>3000 |
|-----------------------------|---|---|-------------------|-------------------|
| <b>Input</b>                |   |   |                   |                   |
| Acceptable Voltage Range:   | 0 ~ 340VAC  |   |                   |                   |
| Voltage Window:             | 220/230/240VAC ±25%   |   |                   |                   |
| Frequency:                  | 45 ~ 65Hz (auto-sensing)  |   |                   |                   |
| Phase:                      | Single-phase + ground   |   |                   |                   |
| <b>Output</b>               |   |   |                   |                   |
| Voltage Range Battery Mode: | 220/230/240VAC ±5%  |   |                   |                   |
| Frequency:                  | 50/60Hz Auto-sensing  |   |                   |                   |
| Capacity:                   | 1000VA/900W   |   |                   |                   |
| Wave Form:                  | Pure sinewave   |   |                   |                   |
| Transfer Time:              | 4 to 6ms typical  |   |                   |                   |
| Efficiency:                 | <b>Line Mode:</b> up to 95%, <b>Boost/Buck Mode:</b> up to 94%  |   |                   |                   |
| Cold Start:                 | Yes   | Yes   | Yes               | Yes               |
| <b>Battery</b>              |   |   |                   |                   |
| Type:                       | Sealed Lead Acid Maintenance-free   |   |                   |                   |
| Capacity:                   | 12V / 7Ah   | 12V / 9Ah   | 12V / 9Ah         | 12V / 9Ah         |
| Quantity:                   | 4   | 4   | 8                 | 8                 |
| Voltage:                    | 24V   | 24V   | 48V               | 48V               |
| Autonomy (full load):       | Minimum 5 minutes   |   |                   |                   |
| Recharge Time:              | 5 Hours to 90% after complete discharge at 100% load  |   |                   |                   |
| <b>Display</b>              |   |   |                   |                   |
| Status on LCD:              | Line bypass, AVR Boost (Buck), Backup, Battery Level, Battery Low, Load Level, Battery Fault, UPS Fault |   |                   |                   |
| Status on LED:              | Line Mode, Battery Mode & Fault   |   |                   |                   |
| Self-Diagnostics:           | Upon Power On and Software Control  |   |                   |                   |
| <b>Protection</b>           |   |   |                   |                   |
| Overload                    | Line Mode:  | >100 to 110% buzzer alarms only, >110 to 120% for 10 min. and then shutdown, >120% shutdown after 1 cycle |                   |                   |
|                             | Battery Mode:   | >100 to 120% buzzer alarms only, >120 to 130% shutdown after 10 sec., >130% shutdown after 1 cycle        |                   |                   |
| Short Circuit               | Line Mode:  | Resettable Breaker  |                   |                   |
|                             | Battery Mode:   | Electronic Circuit  |                   |                   |
| Low Battery:                | Alarm and automatic stop  |   |                   |                   |
| EPO:                        | Shutdown immediately  |   |                   |                   |
| Battery:                    | Electronic System of Management of Battery Discharge  |   |                   |                   |
| Heat Dissipation:           | 96W   | 108W  | 192W              | 216W              |

| Models                        | Sentra XL<br>1000   | Sentra XL<br>1500 | Sentra XL<br>2200                  | Sentra XL<br>3000 |
|-------------------------------|---|-------------------|------------------------------------|-------------------|
| <b>Alarms</b>                 |   |                   |                                    |                   |
| Acoustic & Display:           | Mains Fault, Low Battery, Overload and Fault conditions   |                   |                                    |                   |
| <b>Mechanical</b>             |   |                   |                                    |                   |
| Dimensions H x W x D (in/mm): | 3.5 x 17.3 x 19.3 / 88 x 440 x 491  |                   | 3.5 x 17.3 x 19.3 / 88 x 440 x 701 |                   |
| 230VAC Input Connectors:      | IEC-320-C14   |                   | IEC-320-C20                        |                   |
| 230VAC Output Connectors:     | IEC-320-C13   |                   | IEC-320-C13, IEC-320-C19           |                   |
| 230VAC Net Weight (lb/kg)     | 51 / 25   | 61 / 27.8         | 93 / 42                            | 102 / 46.2        |
| <b>Environment</b>            |   |                   |                                    |                   |
| Operating Temperature:        | 0 to 40°C / 32 to 104°F   |                   |                                    |                   |
| Warning Temperature:          | The battery design life is based on a temperature of 25°C/77°F, Ambient temperature above this range will affect battery life |                   |                                    |                   |
| Elevation:                    | 0 to 2000m up to 40°C / 104°F, 0 to 3000m up to 35°C / 96.8°F   |                   |                                    |                   |
| Humidity:                     | 90% RH maximum, no condensing   |                   |                                    |                   |
| Noise:                        | <b>Line Mode:</b> 40dB max; <b>Bat. Mode:</b> 45dB max.   |                   |                                    |                   |
| <b>Computer Interface</b>     |   |                   |                                    |                   |
| Type:                         | Standard RS232 and USB  |                   |                                    |                   |
| Slots:                        | Relay card/SNMP card  |                   |                                    |                   |
| Compatible Platforms:         | Windows 95/98/NT/2000/XP/Vista/Win7, Novell Netware, linux, MAC   |                   |                                    |                   |
| <b>Agency Compliance</b>      |   |                   |                                    |                   |
| Quality:                      | ISO 9001 certified manufacturing  |                   |                                    |                   |
| Security:                     | EM62040-1-1, UL1778   |                   |                                    |                   |
| Performance:                  | EN62040-3   |                   |                                    |                   |
| Standard EMC:                 | EN62040-2, EN61000-3-2, FCC Class A   |                   |                                    |                   |
| Marking:                      | CE, FCC   |                   |                                    |                   |

# Alpha Continuity 1000-3000

Convertible Indoor Online UPS Series



- Feature rich online UPS Series with rack/tower convertible design with rotating LCD panel enabling easy integration into a wide variety of applications and locations
- Wide input power frequency and voltage window accommodates broad operating range for different working requirements
- Advanced digital control technology achieves higher reliability and greater immunity from utility power problems
- Emergency shutdown control through EPO complies with national safety regulations and local codes
- Programmable built-in charger shortens battery charging time and extends runtime
- Hot-swappable battery allows replacement without interruption to critical loads

| Models  | Continuity 1000   | Continuity 2000                    | Continuity 3000                |
|---|---|------------------------------------|--------------------------------|
| <b>Input</b>  |   |                                    |                                |
| <b>Voltage Window:</b>                              | 160 to 280VAC   |                                    |                                |
| <b>Frequency:</b>                                   | 50/60 ±5% (Auto Sensing)  |                                    |                                |
| <b>Phase/Wire:</b>                                  | Single, Line + Neutral + Ground   |                                    |                                |
| <b>Power Factor:</b>                                | >0.99 (Full Load)   |                                    |                                |
| <b>Output</b>                                       |   |                                    |                                |
| <b>Voltage:</b>                                     | 200/208/220/240VAC  |                                    |                                |
| <b>Voltage Regulation:</b>                          | <±0.1% until low battery warning  |                                    |                                |
| <b>Capacity:</b>                                    | 1000VA/800W   | 2000VA/1600W                       | 3000VA/2400W                   |
| <b>Power Factor:</b>                                | 0.8 Lagging   |                                    |                                |
| <b>Wave Form:</b>                                   | Sinewave, THD<3% (no load to full load)   |                                    |                                |
| <b>Frequency Stability:</b>                         | ±0.1% unless synchronized to line   |                                    |                                |
| <b>Frequency Regulation:</b>                        | 3Hz or 1Hz (Setting by software)  |                                    |                                |
| <b>Transfer Time:</b>                               | 0m sec  | 0m sec                             | 0m sec                         |
| <b>Crest Factor:</b>                                | 3:1   | 3:1                                | 3:1                            |
| <b>Efficiency (AC to AC):</b>                       | >85%  | >85%                               | >88%                           |
| <b>Autonomy (Built-in Battery):</b>                 | >5min   | >5min                              | >5min                          |
| <b>DC Start:</b>                                    | Yes   | Yes                                | Yes                            |
| <b>Battery</b>                                      |   |                                    |                                |
| <b>Type:</b>  | Sealed lead acid maintenance free   |                                    |                                |
| <b>Capacity:</b>                                    | 7Ah   | 7Ah                                | 9Ah                            |
| <b>Quantity:</b>                                    | 3   | 6                                  | 6                              |
| <b>Voltage:</b>                                     | 36VDC   | 72VDC                              | 72VDC                          |
| <b>Recharge Time:</b>                               | 3 hours to 90%  |                                    |                                |
| <b>Built-in Charger (Maximum Charging Current):</b> | 1.8A  | 2.1A                               | 2.7A                           |
| <b>Display</b>                                      |   |                                    |                                |
| <b>LED:</b>   | Normal, Battery, Bypass, Programmable Outlet 1, Programmable Outlet 2, Self-Test, Battery Weak and Bad, Site Wiring Fault, Fault, Overload, and Load/Battery Level Conditions |                                    |                                |
| <b>Key:</b>   | On button / Off button (Test / Alarm silence button)  |                                    |                                |
| <b>Self-Diagnostics:</b>                            | Upon power on and software Control  |                                    |                                |
| <b>Alarms</b>                                       |   |                                    |                                |
| <b>Audible and Visual:</b>                          | Line failure, Battery low, Overload, System fault conditions  |                                    |                                |
| <b>Mechanical</b>                                   |   |                                    |                                |
| <b>Dimensions H x W x D (in/mm):</b>                | 3.5 x 17.3 x 16 / 88 x 440 x 405  | 3.5 x 17.3 x 25.6 / 88 x 440 x 650 |                                |
| <b>230VAC Outlets:</b>                              | 6 x IEC320-C13  |                                    | 4 x IEC320-C13, 1 x IEC320-C19 |
| <b>Weight (lb/kg):</b>                              | 33.3 / 15.1   | 61.5 / 27.9                        | 65.4 / 29.7                    |

| Models   | Continuity 1000   | Continuity 2000 | Continuity 3000 |
|--|---|-----------------|-----------------|
| <b>Protection</b>  |   |                 |                 |
| <b>Overload AC Mode and Backup Modem (delay before switching to bypass):</b> | <105% continuously, >106%~120% for 30 seconds transfer to bypass, >121%~150% for 10 seconds transfer to bypass, >150% immediately transfer to bypass, Buzzer continuously alarms  |                 |                 |
| <b>Bypass Mode:</b>  | <105% continuously, >106%~120% for 250 seconds shut down, >121%~130% for 125 seconds shut down, >131%~135% for 50 seconds shut down, >136%~145% for 20 seconds shut down, >146%~148% for 5 seconds shut down, >149%~157% for 2 seconds shut down, >158%~176% for 1 seconds shut down, >177%~187% for 0.32 seconds shut down, >188% for 0.16 seconds shut down, Buzzer continuously alarms |                 |                 |
| <b>Short Circuit:</b>  | Hold whole system   |                 |                 |
| <b>Overheat:</b>   | <b>AC Mode:</b> Switch to bypass;<br><b>Backup Mode:</b> UPS shuts down immediately   |                 |                 |
| <b>Battery Low:</b>  | Alarm and switch Off  |                 |                 |
| <b>EPO:</b>  | UPS shuts down immediately  |                 |                 |
| <b>Battery:</b>  | Advanced Battery Discharge Management (ABDM)  |                 |                 |
| <b>Noise Suppression:</b>  | 300 Joules  | 300 Joules      | 300 Joules      |
| <b>Environment</b>   |   |                 |                 |
| <b>Operating Temperature:</b>  | 0 to 40°C / 32 to 104°F   |                 |                 |
| <b>Elevation:</b>  | 0~2000m/6600ft up to 40°C / 104°F, 3000m/9900ft up to 35°C / 95°F   |                 |                 |
| <b>Humidity:</b>   | 90% RH maximum, non-condensing  |                 |                 |
| <b>Noise:</b>  | <50dB (at 1m / 3.3ft)   |                 |                 |
| <b>Computer Interface</b>  |   |                 |                 |
| <b>Interface Type:</b>   | Standard RS232 and USB Interfaces   |                 |                 |
| <b>Communication Slots:</b>  | Relay contact board or SNMPcard   |                 |                 |
| <b>Agency Compliance</b>   |   |                 |                 |
| <b>Quality Assurance:</b>  | ISO9001 Certified Company   |                 |                 |
| <b>Safety Standard:</b>  | EN62040-3 complied  |                 |                 |
| <b>Performance:</b>  | EN62040-3 complied  |                 |                 |
| <b>EMC Standard:</b>   | EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A  |                 |                 |
| <b>Marks:</b>  | CE, FCC   |                 |                 |

| Battery Pack Models                    | BP Continuity 1000                  | BP Continuity 2000                 | BP Continuity 3000 |
|--|-------------------------------------|------------------------------------|--------------------|
| <b>Battery Type:</b>                   | 7Ah                                 | 9Ah                                | 9Ah                |
| <b>Maximum Quantity:</b>               | 3-12pcs                             | 12pcs                              | 12pcs              |
| <b>Weight w/out Batteries (lb/kg):</b> | 17.7 / 8                            | 17.7 / 8                           | 17.7 / 8           |
| <b>Weight with Batteries (lb/kg):</b>  | 45.6 to 92.8 / 20.7 to 42.1         | 97 / 44                            | 97 / 44            |
| <b>Dimensions H x W x D (in/mm):</b>   | 6.9 x 17.3 x 16.5 / 176 x 440 x 420 | 3.5 x 17.3 x 25.6 / 88 x 440 x 650 |                    |

# Alpha Continuity 6-10K

## Indoor Online UPS Series



- Feature rich online UPS Series with superior output power factor, enabling energy efficient system performance
- Simple parallel installation simplifies the setup of N+1 redundant systems
- Up to 4 units working in parallel increases potential power output capacity
- Smart ECO mode allows automatic transfer to inverter supply, maximizing efficiency
- LCD/LED display panel provides user-friendly interface to UPS
- Emergency shutdown control through EPO complies with national safety regulations and local codes
- Hot-swappable battery allows replacement without interruption to critical loads

| Models                          | Continuity 6k  | Continuity 10k                      |
|---------------------------------|--|-------------------------------------|
| <b>Input</b>                    |  |                                     |
| Voltage Window:                 | 160~280VAC   | 160~280VAC                          |
| Frequency:                      | 45 to 65Hz   | 45 to 65Hz                          |
| Phase/Wire:                     | Single, Line + Neutral + Ground  |                                     |
| Power Factor:                   | Up to 0.99 at 100% linear load   |                                     |
| Current THD (100% Linear Load): | <7%  | <7%                                 |
| <b>Output</b>                   |  |                                     |
| Voltage:                        | 200/208/220/230/240VAC   |                                     |
| Voltage Adjustment:             | Nominal +1%, +2%, +3%, -1%, -2% or -3%   |                                     |
| Voltage Regulation:             | ±1%  | ±2%                                 |
| Capacity:                       | 6000VA/5400W   | 10000VA/9000W                       |
| Rated Power Factor:             | 0.7 Lagging  | 0.7 Lagging                         |
| Wave Form:                      | Sinewave, THD<3% (no load to full load)  |                                     |
| Frequency Stability:            | ±0.2% (Free Running)   | ±0.2% (Free Running)                |
| Frequency Regulation:           | ±1Hz; ±3Hz   | ±1Hz; ±3Hz                          |
| Transfer Time:                  | 0ms  | 0ms                                 |
| Crest Factor:                   | 3:1  | 3:1                                 |
| Efficiency (AC to AC, Normal):  | Up to 90%  | Up to 90%                           |
| Efficiency (AC to AC, ECO):     | Up to 95%  | Up to 95%                           |
| Autonomy:                       | >=5 min.   | >=5 min.                            |
| DC Start:                       | Yes  | Yes                                 |
| <b>Battery</b>                  |  |                                     |
| Type:                           | Sealed lead acid maintenance free  |                                     |
| Capacity:                       | 12V/7Ah  | 12V/9Ah                             |
| Quantity:                       | 20pcs  | 20pcs                               |
| Voltage:                        | 240VDC   | 240VDC                              |
| Recharge Time:                  | 4 hours to 90%   | 5 hours to 90%                      |
| <b>Display</b>                  |  |                                     |
| Status on LED and LCD:          | Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, Transferring with Interruption and UPS Fault |                                     |
| Readings on LCD:                | Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage and Inner Temperature                     |                                     |
| Self-Diagnostics:               | Upon power-on, Front panel setting and software control, 24-hour routine checking  |                                     |
| <b>Alarms</b>                   |  |                                     |
| Audible and Visual:             | Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions   |                                     |
| <b>Mechanical</b>               |  |                                     |
| Dimensions H x W x D (in/mm):   | 5.2 x 17.3 x 21.3 / 132 x 440 x 543  | 5.2 x 17.3 x 26.8 / 132 x 440 x 680 |
| Input/Output Connection:        | Hardwire   |                                     |
| External Battery Connection:    | Plug-in and play   |                                     |
| Weight (lb/kg):                 | 52.9 / 24  | 57.3 / 26                           |

| Models:  | Continuity 6k  | Continuity 10k   |
|--|--|--|
| <b>Protection</b>                                  |  |  |
| Overload (w/Simulated Thermal Tripping I-T Curve): | Inverter Supply: 105%~150% for 160 seconds ~ 2 cycles before switching bypass.<br>Backup Supply: 105%~200% for 500 seconds ~8 cycles before stopping supply load |  |
| Short Circuit:                                     | Switch off immediately   |  |
| Overheat:  | AC Mode: Switch to bypass, Backup Mode: Switch off the UPS   |  |
| Battery Low:                                       | Alarm and switch Off   |  |
| Noise Suppression:                                 | Complies with EN62040-2  |  |
| Spike Suppression:                                 | Complies with EN61000-4-5  |  |
| Heat Dissipation (At Full Linear Load):            | Without Isolated Transformer Module (<450W):<br>With Isolated Transformer Module (<615W):  | 10K: <600W<br>10KP: <550W<br>10K: <1100W<br>10KP: <1050W |
| Leakage Current:                                   | <3mA at full load  | <3mA at full load  |
| <b>Environment</b>                                 |  |  |
| Operating Temperature:                             | 0 to 40°C / 32 to 104°F  |  |
| Temperature Warning:                               | The battery design life is based on a temperature of 25°C/77°F, Ambient temperature above this range will affect battery life.                                   |  |
| Elevation:   | 0~2000m/6600ft up to 40°C / 104°F,<br>3000m/9900ft up to 35°C / 95°F   |  |
| Humidity:  | 90% RH maximum, non-condensing   |  |
| Noise:   | <50dB (at 1m / 3.3ft)  |  |
| <b>Computer Interface</b>                          |  |  |
| Interface Type:                                    | Standard RS232 Interface   |  |
| Communication Slots:                               | 2nd RS232, USB, RS485, Relay Contact or SNMPCard   |  |
| <b>Agency Compliance</b>                           |  |  |
| Quality Assurance:                                 | ISO9001 Certified  |  |
| Safety Standard:                                   | EN62040-1-1, UL1778  |  |
| EMC Standard:                                      | EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A   |  |
| Marks:   | CE   | CE   |

| Battery Pack Model              | BP Continuity 6K                    | BP Continuity 10K |
|---------------------------------|-------------------------------------|-------------------|
| Battery Type:                   | 7Ah                                 | 9Ah               |
| Max. Quantity:                  | 20pcs                               | 20pcs             |
| Output Voltage:                 | 240VAC                              | 240VAC            |
| Dimensions H x W x D (in/mm):   | 5.2 x 17.3 x 26.8 / 132 x 440 x 680 |                   |
| Weight w/out Batteries (lb/kg): | 39.7 / 18                           | 39.7 / 18         |
| Weight with Batteries (lb/kg):  | 114.6 / 52                          | 149.9 / 68        |

# TRI-Power X33 Mod HP

## Modular Three-Phase UPS (10 to 60KVA)



- Modular and scalable from 10 to 60kVA
- High output power factor 0.9
- Easy to install, easy to handle, easy to maintain easy to expand
- Customized configuration with 3.4, 5.0 & 6.7kVA power modules
- **High Performance on a small foot print:** i.e. 15kVA system with N+1 redundancy, totally modular with 5 minutes back up time in one single cabinet
- Cost effective N+x redundancy; even phase by phase
- Modular battery system
- Advanced battery management
- Double input (model HP40, 45 and 45kVA)

| Models                                   | X33 Mod HP 10   | X33 Mod HP 15 | X33 Mod HP 20 | X33 Mod HP 30                            | X33 Mod HP 40 | X33 Mod HP 45 | X33 Mod HP 60 |
|--|---|---------------|---------------|--|---------------|---------------|---------------|
| <b>Nominal Power (kVA):</b>              | 10  | 15            | 20            | 30                                       | 40            | 45            | 60            |
| <b>Architecture of the UPS:</b>          | Modular, scalable and redundant in one single cabinet   |               |               | Modular, scalable and redundant          |               |               |               |
| <b>Input</b>                             |   |               |               |  |               |               |               |
| <b>Nominal Voltage:</b>                  | 230V 1-phase / 400V 3-phase +N  |               |               | 400V 3-phase +N                          |               |               |               |
| <b>Frequency:</b>                        | 50Hz / 60Hz +/- 2% autosensing  |               |               |  |               |               |               |
| <b>Compatibility with Gensets:</b>       | Configurable for synchr. between the input and output frequencies, even for the highest frequency ranges, +/- 14%     |               |               |  |               |               |               |
| <b>Power Factor at Full Load:</b>        | > 0.99  | > 0.99        | > 0.99        | > 0.99                                   | > 0.99        | > 0.99        | > 0.99        |
| <b>THD of Input Current:</b>             | ≤ 3%  | ≤ 3%          | ≤ 3%          | ≤ 3%                                     | ≤ 3%          | ≤ 3%          | ≤ 3%          |
| <b>Output</b>                            |   |               |               |  |               |               |               |
| <b>Nominal Power (kVA):</b>              | 10  | 15            | 20            | 30                                       | 40            | 45            | 60            |
| <b>Active Power (kW):</b>                | 9   | 13.5          | 18            | 27                                       | 36            | 40.5          | 54            |
| <b>Power Factor:</b>                     | 0.9   | 0.9           | 0.9           | 0.9                                      | 0.9           | 0.9           | 0.9           |
| <b>Nominal Voltage (V):</b>              | 230V 1-phase / 400V 3-phase +N  |               |               | 230V 1-phase / 400V 3-phase +N           |               |               |               |
| <b>Voltage Variation (Static):</b>       | +/- 1% (AC-AC / DC-AC)  |               |               |  |               |               |               |
| <b>Voltage Variation (Dynamic):</b>      | +/- 1% (AC-AC / DC-AC)  |               |               |  |               |               |               |
| <b>Crest Factor (Ipeak/Irms):</b>        | 3 : 1   | 3 : 1         | 3 : 1         | 3 : 1                                    | 3 : 1         | 3 : 1         | 3 : 1         |
| <b>THDv on Nominal Power:</b>            | ≤ 0.5% linear load / ≤ 1% not linear load   |               |               |  |               |               |               |
| <b>Frequency:</b>                        | 50 Hz / 60 Hz (autosensing or selectable)   |               |               |  |               |               |               |
| <b>Frequency Stability Battery Mode:</b> | 0.01%   | 0.01%         | 0.01%         | 0.01%                                    | 0.01%         | 0.01%         | 0.01%         |
| <b>Overload Capability PF 0.9:</b>       | 125% for 5min, 150% for 30sec with no bypass intervention   |               |               |  |               |               |               |
| <b>Batteries</b>                         |   |               |               |  |               |               |               |
| <b>Type/UPS Battery Voltage:</b>         | VRLA - AGM / 240VDC (internal redundant range)  |               |               |  |               |               |               |
| <b>Runtime/Autonomy:</b>                 | Configurable and extendable, both internally and with additional battery cabinets                                     |               |               |  |               |               |               |
| <b>Battery Module:</b>                   | Plug-and-play   |               |               |  |               |               |               |
| <b>Environmental</b>                     |   |               |               |  |               |               |               |
| <b>Communication:</b>                    | 1 x SNMP Slot, 2 x Serial Port RS232, 1x Logic Level Port, 4 x volt-free contacts ports                               |               |               |  |               |               |               |
| <b>Monitoring:</b>                       | Optional (including 1 x RCCMD License with SNMP Interface Card)   |               |               |  |               |               |               |
| <b>Display and Signalling:</b>           | 4 x 20-character lines, 4 menu navigation buttons, multi-coloured LED status indicator, alarms and audible signalling |               |               |  |               |               |               |
| <b>Diagnostic Functions:</b>             | Advanced Diagnostic Functions via Display and / or Remote   |               |               |  |               |               |               |
| <b>Emergency Stop (EPO):</b>             | Yes   | Yes           | Yes           | Yes                                      | Yes           | Yes           | Yes           |
| <b>Operating Temp/-Humidity:</b>         | 0 to 40°C / 20% to 80% non-condensing   |               |               |  |               |               |               |
| <b>Noise level @ 1m (dBA):</b>           | 42 to 46 dBA  |               |               |  |               |               |               |
| <b>Protection Index:</b>                 | IP 21   |               |               | IP 21                                    |               |               |               |
| <b>Efficiency Smart Mode:</b>            | up to 99%   |               |               | up to 99%                                |               |               |               |
| <b>Dimensions H x W x D (in/mm):</b>     | 64.96 x 16.29 x 24.72 / 1650 x 414 x 628  |               |               | 64.96 x 16.29 x 24.72 / 1650 x 414 x 628 |               |               |               |
| <b>Weight w/out Batteries (lb/kg):</b>   | 341.14 / 155  | 341.14 / 155  | 346.1 / 157   | 399 / 181                                | 405.6 / 184   | 421 / 191     | 432.1 / 196   |
| <b>Certifications:</b>                   | EN 62040-1; EN 62040-2; EN 62040-3 (Voltage Frequency Independent) VFI-SS-111   |               |               |  |               |               |               |

# TRI-Power X31 HE

Three-Phase UPS (10 to 20kVA)



- Models available from 10 to 20kVA
- Single-phase output
- Efficiency  $\geq 98\%$  in economy mode
- THDI  $< 3\%$
- Small footprint
- Multilingual graphic display

| Models                                      | X31 HE 10  | X31 HE 15                             | X31 HE 20                             |
|---|--|---------------------------------------|---------------------------------------|
| <b>Power (kVA):</b>                         | 10   | 15                                    | 20                                    |
| <b>Input</b>                                |  |                                       |                                       |
| <b>Rated Voltage:</b>                       | 380/400/415VAC Three-phase with neutral / 200/230/240VAC Single-phase  |                                       |                                       |
| <b>Rated Frequency:</b>                     | 50/60Hz  | 50/60Hz                               | 50/60Hz                               |
| <b>Frequency Tolerance:</b>                 | 40 to 72Hz   | 40 to 72Hz                            | 40 to 72Hz                            |
| <b>Power Factor at Full Load:</b>           | 0.99   | 0.99                                  | 0.99                                  |
| <b>Current Distortion:</b>                  | THDI $\leq 3\%$  | THDI $\leq 3\%$                       | THDI $\leq 3\%$                       |
| <b>Bypass</b>                               |  |                                       |                                       |
| <b>Rated Voltage:</b>                       | 220/230/240VAC Single-phase  | 220/230/240VAC Single-phase           | 220/230/240VAC Single-phase           |
| <b>Number of Phases:</b>                    | 1  | 1                                     | 1                                     |
| <b>Voltage Tolerance:</b>                   | 180 to 264V (selectable)   | 180 to 264V (selectable)              | 180 to 264V (selectable)              |
| <b>Rated Frequency:</b>                     | 50/60Hz  | 50/60Hz                               | 50/60Hz                               |
| <b>Frequency Tolerance:</b>                 | $\pm 5$ (selectable)   | $\pm 5$ (selectable)                  | $\pm 5$ (selectable)                  |
| <b>Output</b>                               |  |                                       |                                       |
| <b>Rated Power (kVA):</b>                   | 10   | 15                                    | 20                                    |
| <b>Active Power (kW):</b>                   | 8  | 12                                    | 16                                    |
| <b>Output Power Factor:</b>                 | 0.8  | 0.8                                   | 0.8                                   |
| <b>Number of Phases:</b>                    | 1  | 1                                     | 1                                     |
| <b>Rated Voltage (V):</b>                   | 220/230/240VAC (Selectable)  | 220/230/240VAC (Selectable)           | 220/230/240VAC (Selectable)           |
| <b>Static Variation:</b>                    | $\pm 1\%$  | $\pm 1\%$                             | $\pm 1\%$                             |
| <b>Dynamic Variation:</b>                   | $\pm 3\%$  | $\pm 3\%$                             | $\pm 3\%$                             |
| <b>Crest Factor (Ipeak/Irms):</b>           | 3:1  | 3:1                                   | 3:1                                   |
| <b>Voltage Distortion:</b>                  | $\leq 1\%$ with linear load / $\leq 3\%$ with nonlinear load   |                                       |                                       |
| <b>Frequency:</b>                           | 50/60Hz  | 50/60Hz                               | 50/60Hz                               |
| <b>Frequency Stability on Battery Mode:</b> | 0.01%  | 0.01%                                 | 0.01%                                 |
| <b>Overload at pF 0.8:</b>                  | 110% for 10 minutes, 133% for 1 minute, 150% for 5 seconds   |                                       |                                       |
| <b>Batteries</b>                            |  |                                       |                                       |
| <b>Type:</b>                                | VRLA AGM/GEL   | VRLA AGM/GEL                          | VRLA AGM/GEL                          |
| <b>Recharge Time:</b>                       | 6 Hours  | 6 Hours                               | 6 Hours                               |
| <b>Environmental</b>                        |  |                                       |                                       |
| <b>Communication:</b>                       | 3 Communication interface slots / R232 / USB   |                                       |                                       |
| <b>Operating Temperature:</b>               | 0 to 40°C / 32 to 104°F  | 0 to 40°C / 32 to 104°F               | 0 to 40°C / 32 to 104°F               |
| <b>Humidity:</b>                            | 90% non-condensing   | 90% non-condensing                    | 90% non-condensing                    |
| <b>Color:</b>                               | Dark Gray RAL7016  | Dark Gray RAL7016                     | Dark Gray RAL7016                     |
| <b>Noise:</b>                               | $< 52$ dBA at 1m   | $< 52$ dBA at 1m                      | $< 52$ dBA at 1m                      |
| <b>Protection Rating:</b>                   | IP 20  | IP 20                                 | IP 20                                 |
| <b>Efficiency Smart Mode:</b>               | $\geq 98\%$ in economy mode  | $\geq 98\%$ in economy mode           | $\geq 98\%$ in economy mode           |
| <b>Dimensions H x W x D (in/mm):</b>        | 51.9 x 17.3 x 33.5 / 1320 x 440 x 850  | 51.9 x 17.3 x 33.5 / 1320 x 440 x 850 | 51.9 x 17.3 x 33.5 / 1320 x 440 x 850 |
| <b>Weight w/out batteries (lb/kg):</b>      | 231.4 / 105  | 253.5 / 115                           | 264.6 / 120                           |
| <b>Compliance:</b>                          | <b>European Directives:</b> L V 2006/95/CE Low voltage directive, EMC 2004/108/EC Electromagnetic compatibility directive<br><b>Standards:</b> Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification according to IEC 62040-3 (Voltage Frequency Independent) VFI-SS-111 |                                       |                                       |

# TRI-Power X33 HE

## Three-Phase UPS (10 to 40kVA)



- Models available from 10 to 40kVA
- High efficiency up to 96.5%
- High output power factor 0.9
- THDI <3%
- Small footprint
- Multilingual graphic display

| Models                                      | X33 HE 10  | X33 HE 15               | X33 HE 20               | X33 HE 30               | X33 HE 40               |
|---|--|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>Power (kVA):</b>                         | 10   | 15                      | 20                      | 30                      | 40                      |
| <b>Input</b>                                |  |                         |                         |                         |                         |
| <b>Rated Voltage:</b>                       | 380/400/415VAC Three-phase with neutral  |                         |                         |                         |                         |
| <b>Rated Frequency:</b>                     | 50/60Hz  | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 |
| <b>Frequency Tolerance:</b>                 | 40 to 72Hz   | 40 to 72Hz              | 40 to 72Hz              | 40 to 72Hz              | 40 to 72Hz              |
| <b>Power Factor at Full Load:</b>           | 0.99   | 0.99                    | 0.99                    | 0.99                    | 0.99                    |
| <b>Current Distortion:</b>                  | THDI ≤3%   | THDI ≤3%                | THDI ≤3%                | THDI ≤3%                | THDI ≤3%                |
| <b>Bypass</b>                               |  |                         |                         |                         |                         |
| <b>Rated Voltage:</b>                       | 380/400/415VAC Three-phase with neutral  |                         |                         |                         |                         |
| <b>Number of Phases:</b>                    | 3+N  | 3+N                     | 3+N                     | 3+N                     | 3+N                     |
| <b>Voltage Tolerance:</b>                   | 180 to 264V (selectable)   |                         |                         |                         |                         |
| <b>Rated Frequency:</b>                     | 50/60Hz  | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 |
| <b>Frequency Tolerance:</b>                 | ±5 (selectable)  | ±5 (selectable)         | ±5 (selectable)         | ±5 (selectable)         | ±5 (selectable)         |
| <b>Output</b>                               |  |                         |                         |                         |                         |
| <b>Rated Power (kVA):</b>                   | 10   | 15                      | 20                      | 30                      | 40                      |
| <b>Active Power (kW):</b>                   | 9  | 13.5                    | 18                      | 27                      | 36                      |
| <b>Output Power Factor:</b>                 | 0.9  | 0.9                     | 0.9                     | 0.9                     | 0.9                     |
| <b>Number of Phases:</b>                    | 3+N  | 3+N                     | 3+N                     | 3+N                     | 3+N                     |
| <b>Rated Voltage (V):</b>                   | 380/400/415VAC (selectable)  |                         |                         |                         |                         |
| <b>Static Variation:</b>                    | ±1%  | ±1%                     | ±1%                     | ±1%                     | ±1%                     |
| <b>Dynamic Variation:</b>                   | ±3%  | ±3%                     | ±3%                     | ±3%                     | ±3%                     |
| <b>Crest Factor (Ipeak/Irms):</b>           | 3:1  | 3:1                     | 3:1                     | 3:1                     | 3:1                     |
| <b>Voltage Distortion:</b>                  | ≤1% with linear load / ≤3% with nonlinear load   |                         |                         |                         |                         |
| <b>Frequency:</b>                           | 50/60Hz  | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 | 50/60Hz                 |
| <b>Frequency Stability on Battery Mode:</b> | 0.01%  | 0.01%                   | 0.01%                   | 0.01%                   | 0.01%                   |
| <b>Overload at pF 0.8:</b>                  | 115% unlimited, 125% for 10 minutes, 150% for 1 minute, 168% for 5 seconds   |                         |                         |                         |                         |
| <b>Batteries</b>                            |  |                         |                         |                         |                         |
| <b>Type:</b>                                | VRLA AGM/GEL   | VRLA AGM/GEL            | VRLA AGM/GEL            | VRLA AGM/GEL            | VRLA AGM/GEL            |
| <b>Recharge Time:</b>                       | 6 Hours  | 6 Hours                 | 6 Hours                 | 6 Hours                 | 6 Hours                 |
| <b>Environmental</b>                        |  |                         |                         |                         |                         |
| <b>Communication:</b>                       | 3 Communication interface slots / R232 / USB   |                         |                         |                         |                         |
| <b>Operating Temperature:</b>               | 0 to 40°C / 32 to 104°F  | 0 to 40°C / 32 to 104°F | 0 to 40°C / 32 to 104°F | 0 to 40°C / 32 to 104°F | 0 to 40°C / 32 to 104°F |
| <b>Humidity:</b>                            | 90% non-condensing   | 90% non-condensing      | 90% non-condensing      | 90% non-condensing      | 90% non-condensing      |
| <b>Color:</b>                               | Dark Gray RAL7016  | Dark Gray RAL7016       | Dark Gray RAL7016       | Dark Gray RAL7016       | Dark Gray RAL7016       |
| <b>Noise:</b>                               | <52dBA at 1m   | <52dBA at 1m            | <52dBA at 1m            | 48dBA at 1m             | 48dBA at 1m             |
| <b>Protection Rating:</b>                   | IP 20  | IP 20                   | IP 20                   | IP 20                   | IP 20                   |
| <b>Efficiency Smart Mode:</b>               | Up to 99%  | Up to 99%               | Up to 99%               | Up to 99%               | Up to 99%               |
| <b>Dimensions H x W x D (in/mm):</b>        | 51.9 x 17.3 x 33.5 / 1320 x 440 x 850  |                         |                         |                         |                         |
| <b>Weight w/out batteries (lb/kg):</b>      | 396.8 / 180  | 401.2 / 182             | 418.8 / 190             | 429.9 / 195             | 378.5 / 335             |
| <b>Compliance:</b>                          | <b>European Directives:</b> LV 2006/95/CE Low voltage directive EMC 2004/108/EC Electromagnetic compatibility directive<br><b>Standards:</b> Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification according to IEC 62040-3 (Voltage Frequency Independent) VFI-SS-111 |                         |                         |                         |                         |

# TRI-Power X33 HE

Three-Phase UPS (60 to 80kVA)



- Models available from 60 to 80kVA
- High efficiency up to 96.5%
- High output power factor 0.9
- THDI <3%
- Small footprint
- Multilingual graphic display

| Models  | X33 HE 60   | X33 HE 80                   |
|---|---|-----------------------------|
| <b>Power (kVA):</b>                                     | 60  | 80                          |
| <b>Input</b>  |   |                             |
| <b>Rated Voltage:</b>                                   | 380/400/145VAC Three-phase with neutral   |                             |
| <b>Rated Frequency:</b>                                 | 50/60Hz   | 50/60Hz                     |
| <b>Frequency Tolerance:</b>                             | 40 to 72Hz  | 40 to 72Hz                  |
| <b>Power Factor at Full Load:</b>                       | 0.99  | 0.99                        |
| <b>Current Distortion:</b>                              | THDI ≤3%  | THDI ≤3%                    |
| <b>Bypass</b>   |   |                             |
| <b>Rated Voltage:</b>                                   | 380/400/415VAC Three-phase with neutral   |                             |
| <b>Number of Phases:</b>                                | 3+N   | 3+N                         |
| <b>Voltage Tolerance:</b>                               | 180 to 264V (selectable)  | 180 to 264V (selectable)    |
| <b>Rated Frequency:</b>                                 | 50/60Hz   | 50/60Hz                     |
| <b>Frequency Tolerance:</b>                             | ±5 (selectable)   | ±5 (selectable)             |
| <b>Output</b>   |   |                             |
| <b>Rated Power (kVA):</b>                               | 60  | 80                          |
| <b>Active Power (kW):</b>                               | 54  | 72                          |
| <b>Output Power Factor:</b>                             | 0.9   | 0.9                         |
| <b>Number of Phases:</b>                                | 3+N   | 3+N                         |
| <b>Rated Voltage (V):</b>                               | 380/400/415VAC (selectable)   | 380/400/415VAC (selectable) |
| <b>Static Variation:</b>                                | ±1%   | ±1%                         |
| <b>Dynamic Variation:</b>                               | ±3%   | ±3%                         |
| <b>Crest Factor (I<sub>peak</sub>/I<sub>rms</sub>):</b> | 3:1   | 3:1                         |
| <b>Voltage Distortion:</b>                              | ≤1% with linear load / ≤3% with nonlinear load  |                             |
| <b>Frequency:</b>                                       | 50/60Hz   | 50/60Hz                     |
| <b>Frequency Stability on Battery Mode:</b>             | 0.01%   | 0.01%                       |
| <b>Overload at pF 0.8:</b>                              | 115% unlimited, 125% for 10 minutes, 150% for 1 minute, 168% for 5 seconds  |                             |
| <b>Batteries</b>  |   |                             |
| <b>Type:</b>  | VRLA AGM/GEL  | VRLA AGM/GEL                |
| <b>Recharge Time:</b>                                   | 6 Hours   | 6 Hours                     |
| <b>Environmental</b>                                    |   |                             |
| <b>Communication:</b>                                   | 3 Communication interface slots / R232 / USB  |                             |
| <b>Operating Temperature:</b>                           | 0 to 40°C / 32 to 104°F   | 0 to 40°C / 32 to 104°F     |
| <b>Humidity:</b>  | 90% non-condensing  | 90% non-condensing          |
| <b>Color:</b>   | Dark Gray RAL7016   | Dark Gray RAL7016           |
| <b>Noise:</b>   | <65dBA at 1m  | <65dBA at 1m                |
| <b>Protection Rating:</b>                               | IP 20   | IP 20                       |
| <b>Efficiency Smart Mode:</b>                           | up to 99%   | up to 99%                   |
| <b>Dimensions H x W x D (in/mm):</b>                    | 74.8 x 29.5 x 33.7 / 1900 x 750 x 855   |                             |
| <b>Weight w/out Batteries (lb/kg):</b>                  | 481.8 / 190   | 440.9 / 200                 |
| <b>Compliance:</b>                                      | <b>European Directives:</b> L V 2006/95/CE Low voltage directive EMC 2004/108/EC Electromagnetic compatibility directive<br><b>Standards:</b> Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification according to IEC 62040-3 (Voltage Frequency Independent) VFI-SS-111 |                             |



# TRI-Power X33 HE

Three-Phase UPS (100 to 120kVA)



- Models available from 100 to 120kVA
- High efficiency up to 96.5%
- High output power factor 0.9
- THDI <3%
- Small footprint
- Multilingual graphic display

| Models  | X33 HE 100                              | X33 HE 120                  |
|---|---|-----------------------------|
| <b>Power (kVA):</b>                                     | 100                                     | 120                         |
| <b>Input</b>  |   |                             |
| <b>Rated Voltage:</b>                                   | 380/400/145VAC Three-phase with neutral |                             |
| <b>Rated Frequency:</b>                                 | 50/60Hz                                 | 50/60Hz                     |
| <b>Frequency Tolerance:</b>                             | 40 to 72Hz                              | 40 to 72Hz                  |
| <b>Power Factor at Full Load:</b>                       | 0.99                                    | 0.99                        |
| <b>Current Distortion:</b>                              | THDI ≤3%                                | THDI ≤3%                    |
| <b>Bypass</b>   |   |                             |
| <b>Rated Voltage:</b>                                   |   |                             |
| <b>Number of Phases:</b>                                | 3+N                                     | 3+N                         |
| <b>Voltage Tolerance:</b>                               | 180 to 264V (selectable)                | 180 to 264V (selectable)    |
| <b>Rated Frequency:</b>                                 | 50/60Hz                                 | 50/60Hz                     |
| <b>Frequency Tolerance:</b>                             | ±5 (selectable)                         | ±5 (selectable)             |
| <b>Output</b>   |   |                             |
| <b>Rated Power (kVA):</b>                               | 100                                     | 120                         |
| <b>Active Power (kW):</b>                               | 90                                      | 108                         |
| <b>Output Power Factor:</b>                             | 0.9                                     | 0.9                         |
| <b>Number of Phases:</b>                                | 3+N                                     | 3+N                         |
| <b>Rated Voltage (V):</b>                               | 380/400/415VAC (selectable)             | 380/400/415VAC (selectable) |
| <b>Static Variation:</b>                                | ±1%                                     | ±1%                         |
| <b>Dynamic Variation:</b>                               | ±3%                                     | ±3%                         |
| <b>Crest Factor (I<sub>peak</sub>/I<sub>rms</sub>):</b> | 3:1                                     | 3:1                         |
| <b>Voltage Distortion:</b>                              |   |                             |
| <b>Frequency:</b>                                       | 50/60Hz                                 | 50/60Hz                     |
| <b>Frequency Stability on Battery Mode:</b>             | 0.01%                                   | 0.01%                       |
| <b>Overload at pF 0.8:</b>                              |   |                             |
| <b>Batteries</b>  |   |                             |
| <b>Type:</b>  | VRLA AGM/GEL                            | VRLA AGM/GEL                |
| <b>Recharge Time:</b>                                   | 6 Hours                                 | 6 Hours                     |
| <b>Environmental</b>                                    |   |                             |
| <b>Communication:</b>                                   |   |                             |
| <b>Operating Temperature:</b>                           | 0 to 40°C / 32 to 104°F                 | 0 to 40°C / 32 to 104°F     |
| <b>Humidity:</b>  | 90% non-condensing                      | 90% non-condensing          |
| <b>Color:</b>   | Dark Gray RAL7016                       | Dark Gray RAL7016           |
| <b>Noise:</b>   | <65dBA at 1m                            | <65dBA at 1m                |
| <b>Protection Rating:</b>                               | IP 20                                   | IP 20                       |
| <b>Efficiency Smart Mode:</b>                           | up to 99%                               | up to 99%                   |
| <b>Dimensions H x W x D (in/mm):</b>                    |   |                             |
| <b>Weight w/out Batteries (lb/kg):</b>                  | 1014.1 / 460                            | 1058.2 / 480                |
| <b>Compliance:</b>                                      |   |                             |

# Galaxy Series

Three-Phase UPS Systems

- Power ranges 10 to 75kVA
- True online double conversion technology
- Network-based power management
- Input Power Factor Correction (PFC)
- All-in-one complete solution



Galaxy 3000



Galaxy 4000

## Galaxy 3000

| Output Power Rating  | 10kVA   | 15kVA      | 20kVA    | 30kVA   |
|--|---|------------|----------|---------|
| <b>Input</b>   |   |            |          |         |
| <b>Voltage:</b>  | 208/220/480/600   |            |          |         |
| <b>Frequency:</b>  | 60Hz (-25 to 8%)  |            |          |         |
| <b>Power Factor:</b>   | >0.99   | >0.99      | >0.99    | >0.99   |
| <b>Current Distortion (THD):</b>                             | >3%   | >3%        | >3%      | >3%     |
| <b>Current (A @ 208V):</b>                                   | 28  | 42         | 56       | 83      |
| <b>Breaker (@ 208):</b>                                      | 40  | 60         | 80       | 125     |
| <b>Output</b>  |   |            |          |         |
| <b>Voltage:</b>  | 208 (220/480/600)   |            |          |         |
| <b>Frequency:</b>  | 60Hz (±1 to 4% selectable)  |            |          |         |
| <b>Transient Response:</b>                                   | ±3% for 0 to 100% to 0%   |            |          |         |
| <b>Voltage Distortion THD:</b>                               | <3% L-L and L-N   |            |          |         |
| <b>Inverter Overload:</b>                                    | 120% for 1 min, 145% for 30 sec   |            |          |         |
| <b>Bypass Overload:</b>                                      | 10x nominal current, 1 cycle  |            |          |         |
| <b>Output Current (A @ 208V):</b>                            | 28  | 42         | 56       | 83      |
| <b>Heat Rejection (max. BTUs):</b>                           | 4821  | 7232       | 8895     | 13342   |
| <b>Batteries</b>   |   |            |          |         |
| <b>Backup Time<sup>1</sup> (minutes):</b>                    | 11/39/60  | 7/22/35/55 | 15/24/38 | 8/12/21 |
| <b>Mechanical</b>  |   |            |          |         |
| <b>Cabinet Dimensions (in/mm):</b>                           | 32.8 x 40.1 x 62.4 / 833.1 x 1018.5 x 1585  |            |          |         |
| <b>Weight<sup>2</sup> (lb/kg):</b>                           | 2565 / 1163.5   |            |          |         |
| <b>Micro Cabinet<sup>3</sup> Dimensions (in/mm):</b>         | 23 x 33.5 x 48.5 / 584 x 851 x 1232   | —          | —        | —       |
| <b>Weight (lb/kg):</b>                                       | 830 / 376.5   | —          | —        | —       |
| <b>Auxiliary Cabinet Maintenance Bypass Cabinet (in/mm):</b> | 18.8 x 41.1 x 62.4 / 477.5 x 1044 x 1585  |            |          |         |
| <b>Battery Cabinet (in/mm):</b>                              | 23 x 35.5 x 62.4 / 584 x 851 x 1585   |            |          |         |
| <b>Weight (lb/kg):</b>                                       | 2723 / 1235   |            |          |         |
| <b>Standards</b>   |   |            |          |         |
| <b>Standards:</b>  | UL 1778, cUL, FCC Class A parts, 15 sub part J Class A, IEC 1000 level 4, IEEE C62.41-B3, NEC, ISO 9001   |            |          |         |
| <b>Standard Features:</b>                                    | Input distribution management, Digital power quality management system (PWM/IGBT inverter), Step load voltage stabilization, Intelligent battery management system, Fault tolerant architecture, Scalable architecture (10 and 20kVA models, No extra cabinet for isolation transformer, Integrated battery bank, Low audible noise fans (<53dBA), Casters with leveling feet, Network based software for multi-server control, Dry contact i/o card, SNMP manageable, Color graphic display with multilingual user interface, Bottom or top entry, Integrated maintenance bypass, Four communications ports, 12 month warranty |            |          |         |
| <b>Optional Features:</b>                                    | Matching power distribution unit (84 circuits), EIA232 / EIA485 serial interface, Ethernet/SNMP network connection kit, Dual input, External maintenance bypass, Input isolation transformer  |            |          |         |

## Galaxy 4000

| Output Power Rating  | 40kVA                                 | 50kVA       | 65kVA       | 75kVA       |
|--|---------------------------------------|-------------|-------------|-------------|
| <b>Input</b>   |                                       |             |             |             |
| <b>Input Voltage:</b>  | 208V                                  | 208V        | 208V        | 208V        |
| <b>Input Frequency:</b>  | 60Hz (±5%)                            |             |             |             |
| <b>Power Factor:</b>   | >0.98                                 | >0.98       | >0.98       | >0.98       |
| <b>Current Distortion (THD):</b>   | >3%                                   | >3%         | >3%         | >3%         |
| <b>Current (A @ 208V):</b>   | 102                                   | 127         | 166         | 191         |
| <b>Output</b>  |                                       |             |             |             |
| <b>Voltage:</b>  | 208V                                  | 208V        | 208V        | 208V        |
| <b>Frequency:</b>  | 60Hz (±1 to 4% selectable)            |             |             |             |
| <b>Transient Response:</b>   | ±5% for 0 to 100% to 0%               |             |             |             |
| <b>Voltage Distortion THD:</b>   | <1% L-L and L-N                       |             |             |             |
| <b>Inverter Overload 130%:</b>   | 1 min                                 | 1 min       | 1 min       | 1 min       |
| <b>Inverter Overload 145%:</b>   | 30 sec                                | 30 sec      | 30 sec      | 30 sec      |
| <b>Bypass Overload:</b>  | 10x nominal current, 1 cycle          |             |             |             |
| <b>Output Current (A @ 208V):</b>  | 111                                   | 139         | 180         | 208         |
| <b>Heat Rejection (max. BTUs):</b>   | 14900                                 | 18700       | 24200       | 28000       |
| <b>Runtimes (@ 100% Load)</b>  |                                       |             |             |             |
| <b>1 x 285W/Cell:</b>  | 12                                    | 9           | 6           | —           |
| <b>1 x 370W/Cell:</b>  | 20                                    | 14          | 9           | 8           |
| <b>1 x 500W/Cell:</b>  | 28                                    | 22          | 15          | 11          |
| <b>2 x 370W/Cell:</b>  | 47                                    | 36          | 25          | 22          |
| <b>2 x 500W/Cell:</b>  | 67                                    | 52          | 38          | 31          |
| <b>3 x 500W/Cell:</b>  | 98                                    | 85          | 60          | 53          |
| <b>4 x 500W/Cell:</b>  | 136                                   | 115         | 85          | 72          |
| <b>Mechanical</b>  |                                       |             |             |             |
| <b>Standard Cabinet Dimensions (in/mm):</b>  | 33.5 x 72.1 x 35.6 / 851 x 1831 x 904 |             |             |             |
| <b>Weight (lb/kg):</b>   | 1235 / 560                            | 1235 / 560  | 1235 / 560  | 1235 / 560  |
| <b>Battery Cabinet Dimensions (in/mm):</b>   | 26.5 x 72.1 x 33.5 / 673 x 1831 x 851 |             |             |             |
| <b>Weight (lb/kg):</b>   | 2045 / 928                            | 2045 / 928  | 2045 / 928  | 2045 / 928  |
| <b>Second Battery Cabinet Dimensions (in/mm):</b>  | 33.5 x 72.1 x 33.5 / 851 x 1831 x 851 |             |             |             |
| <b>Weight (lb/kg):</b>   | 2745 / 1245                           | 2745 / 1245 | 2745 / 1245 | 2745 / 1245 |
| <b>Standards</b>   |                                       |             |             |             |
| ISO 9001, UL 1778, cUL, FCC Part 15, subpart J, Class A, NEMA PE 1, NEMA 250, NFPA 70, IEC 10000 (801) level 4, OSHA   |                                       |             |             |             |
| <b>Optional Features</b>   |                                       |             |             |             |
| RS232/RS485 serial interface, Ethernet/SNMP web card connection kit, External maintenance bypass with interlock, Internal maintenance bypass, Seismic brackets, 42 pole distribution |                                       |             |             |             |

# Trinity 4200 Series

Three-Phase UPS

- 15, 25, 50 and 80kVA power ratings
- 100% front access
- Internal maintenance bypass (except on 80kVA)
- "Active Front End" provides total power factor correction and utility cost savings
- Internal batteries reduce footprint for easy installation (except on 80kVA)



Trinity 15kVA



Trinity 80kVA

| Models   | Trinity 15           | Trinity 25           | Trinity 50           | Trinity 80           |
|--|----------------------|----------------------|----------------------|----------------------|
| <b>Output Power Rating:</b>                              | 15kVA/12kW           | 25kVA/20kW           | 50kVA/40kW           | 80kVA/64kW           |
| <b>Input Voltage</b><br>(-15 to 10%; -30 if derated):    | 208/120 4 wire + gnd | 208/480 3 wire + gnd | 208/480 3 wire + gnd | 208/480 3 wire + gnd |
| <b>Output Voltage</b><br>(±2% Regulation Balanced Load): | 208/120 4 wire + gnd | 208/120 4 wire + gnd | 208/120 4 wire + gnd | 208/120 4 wire + gnd |
| <b>Input Circuit Breaker @ 208V:</b>                     | 60A                  | 90A                  | 175A                 | 300A                 |
| <b>Output Current Per Phase</b><br>(@ 208/120V):         | 41.7A                | 69.4A                | 138A                 | 222A                 |
| <b>Typical Heat Output</b> (KBTU/Hr):                    | 5.73                 | 7.6                  | 17.73                | 24.27                |
| <b>Audible Noise</b> (@ 1 Meter):                        | <60dBA               | <60dBA               | <65dBA               | <65dBA               |

| Internal Battery Runtime             |        |        |        |                  |
|--------------------------------------|--------|--------|--------|------------------|
| <b>Full Load @ 0.7 Power Factor:</b> | 10 min | 5 min  | 5 min  | External Battery |
| <b>Half Load @ 0.7 Power Factor:</b> | 30 min | 15 min | 15 min | Pack Options*    |

| Mechanical                           |   |   |   |                                       |
|--------------------------------------|---|---|---|---------------------------------------|
| <b>Dimensions H x W x D (in/mm):</b> | 59.8 x 36.3 x 20 / 1518.9 x 929.6 x 508 | 59.8 x 36.3 x 20 / 1518.9 x 929.6 x 508 | 59.8 x 37.6 x 35.6 / 1518 x 955 x 904.2 | 74 x 31 x 44 / 1879.6 x 787.4 x 117.6 |
| <b>Weight (lb/kg):</b>               | 900 / 408.2                             | 910 / 412.7                             | 2548 / 1115.8                           | 2450 / 1111.3                         |

| Power Rating                           |  |
|--|--|
| <b>Input Power Factor Corrections:</b> | >0.95 PF (lagging)   |
| <b>Input Harmonic Currents:</b>        | <3% THD (typical)  |
| <b>Input Frequency Range:</b>          | 60Hz, ±5%  |
| <b>Load Crest Factor:</b>              | ≤3   |
| <b>Overload Capacity Inverter:</b>     | 125% for 90 sec, 150% for 30 sec                               |
| <b>Overload Capacity Bypass:</b>       | 125% for 10 min, 1000% for 1 cycle                             |
| <b>Neutral Conductor Size:</b>         | 1.73 x conductor   |
| <b>Load Inrush Current Protection:</b> | Automatically transfers to bypass then retransfers to inverter |
| <b>Typical Efficiency AC/AC:</b>       | 87%  |
| <b>Output Frequency:</b>               | 60Hz, ±0.1%  |

| Status and Control                |  |
|-----------------------------------|--|
| <b>AC Input Present:</b>          | Input and output frequency   |
| <b>Inverter Operating:</b>        | Operating status menu  |
| <b>UPS on Bypass:</b>             | Diagnostic status menu   |
| <b>UPS on Battery:</b>            | DB9 dry contact interface  |
| <b>Fault:</b>                     | RS232 communications   |
| <b>Input and Output Voltage:</b>  | Emergency power off switch   |
| <b>Output Current Indicator:</b>  | Run/Stop key switch  |
| <b>Battery Voltage Indicator:</b> | Terminal block (input/output power connector)<br>Internal maintenance bypass (except on 80kVA) |
| <b>Optional Features:</b>         | External maintenance bypass, SNMP  |

| Warranty   |  |
|--|--|
| 3 year parts and labor, 2 years on batteries.<br>See warranty statement for further details, conditions and limitations. |  |

\* 4 to 64 min runtime options.

# EPS 7000

## Three-Phase UPS



- High output power factor (0.9 pf)
- Low kVAR input filter
- No leading power factor
- High energy efficiency
- Reduced footprint
- High power density
- Fault tolerant architecture

|  | 300kVA/260kW | 400kVA/360kW | 500kVA/450kW | 300kVA/270kW | 400kVA/360kW | 500kVA/450kW |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Input/Output Voltage:</b>                   | 480/480V     | 480/480V     | 480/480V     | 600/600V     | 600/600V     | 600/600V     |
| <b>Nominal Input Current:</b>                  | 371A         | 508A         | 656A         | 322A         | 441A         | 569A         |
| <b>Maximum Input Current:</b>                  | 543A         | 688A         | 840A         | 466A         | 586A         | 711A         |
| <b>Nominal Bypass Current:</b>                 | 361A         | 481A         | 601A         | 289A         | 385A         | 481A         |
| <b>UPS Output Current:</b>                     | 361A         | 481A         | 601A         | 289A         | 385A         | 481A         |
| <b>Input CB Trip/Frame Size:</b>               | 1000/1200A   | 1000/1200A   | 1000/1200A   | 1000/1200A   | 1000/1200A   | 1000/1200A   |
| <b>Maintenance Bypass Trip/Frame Size (A):</b> | 800/1200A    | 800/1200A    | 800/1200A    | 700/1200A    | 700/1200A    | 700/1200A    |
| <b>Maximum DC Current:</b>                     | 721          | 962          | 1195         | 721          | 962          | 1195         |
| <b>DC Breaker Trip/ Frame Size (A):</b>        | 700/1200A    | 1000/1200A   | 1200/1200A   | 700/1200A    | 1000/1200A   | 1200/1200A   |
| <b>System Efficiency:</b>                      | 94%          | 94%          | 93%          | 94%          | 94%          | 93%          |
| <b>Full Load Heat Rejection (BTUs):</b>        | 59400        | 78100        | 110750       | 65000        | 86000        | 112000       |

### Standard Features

IGBT/PWM inverter, Low kVAR solid state input filter, K-20 output transformer, Redundant fans, Advanced battery management system, Detailed metering system, Fault current management circuitry, Two stage input current limit, Serial and dry contact interface, Local and remote E.P.O circuit, High capacity 100% rated static transfer switch

### DC Rating

**Nominal Voltage:** 480VDC

### Environmental

**Acoustical Noise Level:** 75dBA at 5ft  
**Operational Temperature:** 0 to 40°C / 32 to 104°F  
**Storage Temperature:** -20 to 45°C / -4 to 113°F  
**Humidity:** 0 to 90% non-condensing

### Mechanical

**Dimensions UPS Module (in/mm):** 69 x 82 x 39 / 1752.6 x 2082.8 x 990.6  
**Weight (lb/kg):** 6900 / 3129.8  
**Dimensions Maintenance Bypass Cabinet (in/mm):** 22.75 x 82 x 39 / 557.9 x 2082.8 x 990.6  
**Weight (lb/kg):** 540 / 224.9  
**Dimensions Bottom Entry Cabinet (in/mm):** 14 x 82 x 39 / 355.6 x 2082.8 x 990.6  
**Weight (lb/kg):** 190 / 86.2  
**Dimensions Transformer Cabinet (in/mm):** 44.75 x 82 x 39 / 1136.7 x 2082.8 x 990.6  
**Weight (lb/kg):** 3600 / 1632.9

**Options:** input isolation transformer, output distribution, external maintenance bypass, bottom cable entry, remote alarm status panel, seismic anchors, battery monitoring, battery disconnect, SNMP/ Network management card, critical bus synchronization module, graphical user interface with network connection, continuous duty and momentary duty static switch cabinets (SSC)

### Input

**Voltage:** 480 or 600VAC, ±10%, three-phase, 3 wire + ground  
**Frequency:** 60Hz ± 5%  
**Power Factor:** 0.9 lagging with filter  
**THDI:** 7% THDI at full load  
**Reactive Current (kVAR):** <15% of nominal input current  
**Inrush Current:** Up to 600% nominal current for less than one cycle  
**Power Walk-in:** 0 to 100% over a 10 second period

### Bypass Input

**Voltage:** Must match rectifier input, ±10% UPS output voltage (three-phase, 3/4 wire + ground)  
**Frequency:** 60Hz (±0.25Hz up to 2Hz)

### Output

**Voltage:** 480 or 600VAC, ±3%, three-phase, 3 or 4 wire + ground  
**Power Factor:** 0.9 at nominal kVA up to unity at rated nominal kW  
**Frequency:** 60Hz ± 0.1% free running synchronized with bypass (selectable in 0.25Hz increments)  
**Voltage Regulation:** ±0.5% steady state  
**Voltage Recovery Time:** ±1% of the steady state value within 1 cycle  
**Voltage Distortion:** 2% L-L (4% L-N) THDI max  
**Inverter Overload:** 125% for 10 min, 150% for 1 min  
**Unbalanced Load:** Up to 100% 120° ±3% maximum angle displacement, ±3% maximum voltage deviation

# Flextra Enclosures

Earthquake and Weather Resistant Enclosures

- Telcordia, seismic zone 4 approved NEMA 3R/IP22 outdoor weather resistant enclosure
- Reliable backup power for critical equipment
- Pole, wall, ground or pedestal mount configurations
- Optional maintenance bypass feature



Z8 Enclosure

## Flextra P Series

| Models                        | Flextra Universal Mount Enclosures   |                                      | Extended Standby               |
|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------|
|                               | P4                                   | P6                                   | P8                             |
| <b>Mechanical</b>             |                                      |                                      |                                |
| Dimensions H x W x D (in/mm): | 24.75 x 30.25 x 16 / 629 x 768 x 406 | 36.75 x 24.25 x 14 / 933 x 615 x 355 | 36.88 x 30.25 x 16 / 768 x 406 |
| Weight (lb/kg):               | 57 / 26                              | 68 / 31                              | 121 / 55                       |
| Battery Capacity:             | 4                                    | 6                                    | 8                              |

## Flextra U Series

| Models                        | Flextra Ground/Pad Mount Enclosures  |                                      |                                      |
|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|                               | U4                                   | U6                                   | U8                                   |
| <b>Mechanical</b>             |                                      |                                      |                                      |
| Dimensions H x W x D (in/mm): | 30.25 x 24.75 x 16 / 768 x 629 x 406 | 24.25 x 36.75 x 14 / 615 x 933 x 355 | 30.25 x 36.88 x 16 / 768 x 937 x 406 |
| Weight (lb/kg):               | 57 / 26                              | 68 / 31                              | 121 / 55                             |
| Battery Capacity:             | 4                                    | 6                                    | 8                                    |

## Flextra Z Series

| Models                        | Z4                             | W8                             |
|-------------------------------|--------------------------------|--------------------------------|
| <b>Mechanical</b>             |                                |                                |
| Dimensions H x W x D (in/mm): | 36 x 24 x 14 / 914 x 610 x 56  | 37 x 31 x 16 / 956 x 788 x 407 |
| Weight (lb/kg):               | 350 / 158                      | 812 / 368                      |
| Battery Capacity:             | 4                              | 6                              |
| Finish:                       | Powdercoat white over aluminum |                                |

### Standard Features

Input/Output Surge Protection, Intelligent buck/boost operation for greater protection, Hot-swappable UPS and batteries, Noise suppression, FCC Class B, Multiple mounting configurations, Rugged outdoor weather resistant construction, Lockable enclosure, NRTL/CSA/CE approved

**8 Battery System also includes:** Telcordia Zone 4 approved with Battery Retention Bar, Telcordia salt fog tested, 14 day operational, Telcordia approved Door Restraint

## Flextra N Series

| Models   | N3  | Dual N3  |
|--|---|--|
| <b>Enclosure Configurations</b>  |   |  |
| Configuration:   | 1 power module<br>1 bypass switch<br>1 battery string | 1 power module<br>1 bypass switch<br>4 battery strings |
| <b>Options</b>   |   |  |
| Battery Heater Mat (BHM), Manual Transfer Switch (MTS), Meter Head, Standby Generator, Propane Storage Cabinet, Remote Generator Interface Kit |   |  |

\*Weight dependent upon internal battery choice.

# MMOE Enclosure

Telecom Outdoor Enclosure



- Compact enclosure design provides ideal fit for locations where aesthetics and footprint are important
- Light-weight powdercoated aluminum construction offers superior corrosion resistant properties
- Large sun shield reduces solar heat load inside cabinet
- 180° stainless steel piano-hinged door (with two locking open positions) make installation and maintenance easy and convenient

| Mechanical  |  |
|---|--|
| <b>Dimensions H x W x D (in/mm):</b>  | 27 x 22 x 18 / 687 x 559 x 457   |
| <b>Weight (lb/kg):</b>  | 60 / 27.2  |
| <b>Construction:</b>  | High strength corrosion resistant aluminum   |
| <b>Finish:</b>  | Powdercoated white color   |
| <b>Equipment Space:</b>   | 5RU with one battery shelf   |
| <b>Cable Entrance:</b>  | Bottom of enclosure: 1 x 3" diameter knock-out (2½" trade size), 4 x 1.125" diameter knock-out (¾" trade size) |
| Hardware  |  |
| <b>Hinge Type:</b>  | Stainless steel piano hinge  |
| <b>Door Prop:</b>   | Aluminum rod, 2 locking open positions   |
| <b>Door Latch:</b>  | Bellcore 216 compression lock with pad lock collar   |
| HVAC Specifications   |  |
| <b>Cooling:</b>   | Thermostat controlled 48VDC fan, 100 cfm or better, ON at 49°C / 120°F Off at 32°C / 89°F                      |
| <b>Door Installed Louvers:</b>  | Equipped with splash baffle  |
| Environmental   |  |
| <b>Operating Temperature:</b>   | -40 to 46°C / -40 to 114.8°F   |
| <b>Storage Temperature:</b>   | -40 to 85°C / -40 to 185°F   |
| Installation  |  |
| <b>Access:</b>  | Front hinged door provides full front access   |
| Maintenance   |  |
| <b>Door Installed Louvers:</b>  | Equipped with splash baffle or washable filters  |
| Enclosure Options   |  |
| <b>Mounting:</b>  | Pole, host, wall or pedestal (please specify of pole used is concrete at time of order)                        |
| System Specification (as shown)   |  |
| <ul style="list-style-type: none"> <li>• Battery shelf with 4x AlphaCell 195GXL-FT batteries</li> <li>• FXM1100 UPS</li> <li>• Pedestal mount kit</li> </ul> System Options: <ul style="list-style-type: none"> <li>• Alpha universal automatic transfer switch</li> <li>• Alpha universal generator transfer switch</li> <li>• AlphaGuard battery balancer</li> <li>• Battery heater mats</li> <li>• Transient voltage surge suppression device</li> </ul> |  |
| Agency Compliance   |  |
| <b>CSA/UL:</b>  | C22.2 No. 60950  |
| <b>Telcordia:</b>   | GR-13-CORE   |
| <b>NEMA Rating:</b>   | 3R   |

# INEX System

## 48V Modular Inverter System



- Versatile modular inverter system provides flexible power for different applications
- Expandable capacity up to 18kVA with N+1 redundancy configuration
- "All master" dynamic mechanism eliminates single point failure to optimize reliability
- Hot-swappable operation allows module addition or removal without powering down
- High power density and high efficiency

### Inverter Module

INEX inverter module provides pure sinewave AC power output for critical telecommunication equipment. Adopting N+1 redundancy design, INEX Inverter can operate up to 24 units in parallel. INEX inverter module is specially designed with compact size of maximized power density and can reach up to 5.57W/inch<sup>3</sup> for INEX 1000 and 8.36W/inch<sup>3</sup> for INEX1500. 1RU height design allows the module to be installed onto a standard ETSI 300mm Rack. INEX module provides the revolutionary telecom power solution in terms of maximum flexibility and reliability.



- Pure sinewave
- Hot-swap replacement in shelf
- High efficiency >89%
- DSP design for higher system reliability
- Lower audible noise <55dBA
- Smart fan speed control
- N+1 redundancy system, load sharing difference < 5%
- High power density
- Emergency Power Off function embedded
- CAN Bus interface embedded
- -48VDC Telecom system application
- Wide operation temperature range, -20 to 70°C / -4 to 158°F

### STS Module

INEX STS (Static Transfer Switch) module increases system reliability by automatic power transfer between the inverter output and the AC mains. By setting up the priority of operation mode, users can change the system status of "online mode" or "off line mode". The online mode will keep the input power provided by inverter line and when inverter fails, the line will switch to AC utility line. In off line mode, the system power is always connected to the AC utility line and will switch to inverter power line when AC utility fails. The transfer time is less than 1/4 cycle which prevents the power interruption. The reliable performance of INEX STS module will provide the maximum protection to the connected telecommunication equipment against possible damage caused by the system power failure.



- Universal input range
- Hot-swap replacement in shelf
- Back-feed protection
- Redundant fan design
- Redundant power supply design
- Operation Priority Setup of transfer side by setting in Control Module
- Fast transfer time, typically less than 1/4 cycle
- Wide operation temperature range, -20 to 70°C / -4 to 158°F
- Lower audible noise <55dBA
- Emergency Power Off function embedded
- No-cross connect
- Optional maintenance bypass switch function
- CAN Bus interface embedded

### Controller Module

INEX controller module allows users to monitor the system status in real time. The superior design enables users to manage the inverter and STS module status including voltage, current, frequency, capacity and temperature. With a user-friendly interface design, users can easily manage the inverter and STS module settings including voltage, frequency, redundancy (for inverter module), and priority (STS module). The controller module can also record the alarm history which can help to understand the operating status while maintaining the system or making further adjustments to improve system performance.



- CAN Bus protocol for module communication
- Relay contact output for customized alarms
- Hot-swappable design
- Real time clock embedded
- Comprehensive LCD & LED for status display
- Audible alarm function

### Communication Interface

The communication interface includes several options for wider applications which facilitates the remote managing to the system. The standard ports include relay contacts, RS-232, RS-485, USB. Relay contacts provide five programmable settings to display customized information. RS-232 & USB ports provide the serial connection to PC for software monitoring. RS-485 provides long distance connection for direct monitoring. The optional SNMP offers remote monitoring capability using a browser interface. The communication interface provides powerful monitoring and managing solutions to the system manager.



- Relay contacts
- RS-232
- RS-485
- SNMP (Optional)
- USB

### Telecom Power Monitoring Software

TelecomPower is a monitoring software which supports either stand alone computer or network connected computers.



- Monitoring to each module in the inverter system in real time
- Provides panoramic view of all the related information of utility power, system status, STS status
- Auto search function with any inverter power modules in LAN
- Password security protection
- Install and uninstall is easy and clear



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