Company Overview

With 4 decades of industry leadership in POWER, Alpha Technologies has established itself as the preeminent total power solutions provider and one stop source for AC, DC, hybrid and renewable powering solutions for the Telecom, Cable TV, Traffic, ITS, Industrial and Alternative Energy industries. Alpha's products are the trusted power behind large switching and data centers, mobile cell sites, broadband networks, traffic and security systems, DAS networks, and many more.

Our intimate knowledge of our customers allows us to understand powering problems better than other providers of power, and to quickly design/deliver solutions specifically tailored to solve your powering challenges. With multiple options for standardized and custom system design, Alpha has the ability to provide the ideal solution for virtually any application.

The Alpha Group

The Alpha Group represents an alliance of companies who share a common philosophy – to create world class powering solutions.

Collectively, Alpha Group members develop and manufacture AC, DC and renewable power conversion, protection and standby products. Applications for these products include Cable TV, Telecom, Commercial, Industrial and Distributed Generation for a worldwide customer base. In addition to these core specialties, Alpha Group companies provide a complete range of installation and maintenance services.

Market Overview

In the Telecom sector, Alpha’s DC solutions have long been the standard of performance and efficiency, built on superior communications and control functionality inherent in our Cordex™ family of controllers. Much of Alpha’s ongoing research and development activity focuses on continually evolving the next generation of our DC power; driving OPEX savings down by way of greater efficiency, power density and reliability.

In addition to our leadership in Critical Facilities and Cell Site power, Alpha is also at the forefront of developing powering solutions for DAS, Small Cells and Line Power - a rapidly emerging alternative to using local power as a means of powering Fiber to the Home, DAS and DSLAMs.

In the emerging Traffic market, Alpha is the leader in providing back up power and power conditioning for traffic lights, controllers, highway signage and Intelligent Transportation Systems (ITS). To date, over half of the States in America have standardized on Alpha UPS’s for these applications, resulting in Alpha systems already backing up over 20,000 intersections.

In the Alternative Energy sector, renewable energy solutions are rapidly gaining favor due to their versatility; improving economics and positive impact on the environment.

Lastly, from critical enterprise systems to Smart Grid to Security, Alpha offers the right mix of power systems and enclosures to ensure the reliability and continuity of private and industrial networks. Alpha has supplied the backup power for some of the largest networks, protecting borders, utility grids and long haul fiber networks.

In all these markets, Alpha’s success lies in our ability to quickly deliver total power solutions that solve our customers’ unique powering challenges and to provide exceptional customer service and support.
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**FP** – High Performance products offering exceptional efficiency, functionality and reliability
Standard Solutions

Alpha has 4 decades of experience providing a full suite of AC and DC power solutions for both indoor and outdoor applications. Alpha’s products are the power behind large switching centers and data centers, mobile cell sites, cable TV networks, and traffic and security systems. We complement our power equipment and systems with a broad array of ruggedized, thermally managed cabinets and enclosures for deployment in harsh environments. Our line of Cordex controllers provides sophisticated, easy-to-use control, monitoring and management of our power systems. With multiple options for standardized and custom system integration, Alpha has the ability to provide the ideal solution for virtually any power and site installation scenario.

By coupling advanced power technology with an enormous selection of system components, we can easily configure optimized and reliable system solutions up to an impressive 10,000 Amps.

Cordex HP represents Alpha’s High Performance Solutions that are "Best in Class" in:

- Power density, flexibility and functionality
- Efficiency
- High temperature operation
- Reducing total cost of ownership (CAPEX and OPEX)

With HP products successfully deployed in the market now and a variety of new products in the development pipeline, the HP branded products illustrate Alpha’s engineering commitment to designing smarter, greener power electronics for the future.
DC Power Solutions

Alpha builds on its extensive experience in serving the Telecom, Data Center, Cable TV, Security and Traffic markets to deliver the broadest assortment of DC power solutions. Our solutions range from multi-bay systems for large switching offices to small shelf systems that can mount on a wall, or occupy a single rack space. Alpha’s leading-edge, high efficiency power conversion technology and Cordex controllers are the essential building blocks of our DC power solutions. But our power systems are further distinguished by a variety of distribution options and craft-friendly cable management that enable them to serve a broad variety of applications.

Alpha’s shelf systems provide a complete power solution in a rack mount package. Each system incorporates a Cordex™ controller, rectifiers and distribution options in a compact shelf design. Distribution can be inside the shelf for applications with a few loads, or adjoined in integrated panels for those sites where additional distribution positions are needed. In either case, optional accessories such as Low Voltage Disconnects (LVD’s), shunts and temperature compensation are common options on most integrated solutions.

For medium to large system applications, Alpha offers a complete line of standard AC and DC system solutions designed to maximize space and cost savings. System options include various relay rack structures, custom distribution configurations, multiple voltage output designs and front accessibility. As with shelf systems, the standard accessories such as LVD’s, shunts and temperature compensation are available.

On top of this extensive line of standard products, Alpha continues its legacy of designing new solutions to meet market needs. Capitalizing on our experience in multiple markets plus our technical and application know-how, Alpha is ready to earn your business with solutions that meet your unique requirements.
Cordex™ DC Power Systems

<table>
<thead>
<tr>
<th>AMPS (not to scale)</th>
<th>CXPS-C</th>
<th>CXPS-HX</th>
<th>CXPS-W</th>
<th>CXPS-E3</th>
<th>CXPS-E1</th>
<th>1.2kW Shelf</th>
<th>48-650W Single shelf</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXC-HP</td>
<td>CXC-HP</td>
<td>CXC-HP</td>
<td>CXC-HP</td>
<td>CXC-HP</td>
<td>CXCM1-HP</td>
<td>CXCM1-HP</td>
<td>CXCI+ HP</td>
</tr>
<tr>
<td>48V</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Clean and reliable DC power supply for critical loads available in two options: 24V/400W or 48V/650W
Internet ready and remotely accessible for complete and cost effective system and site monitoring
Advanced battery charging, monitoring and testing to ensure sufficient reserve power availability
Configurable platform with I/O’s for site monitoring, user-definable alarms, data logging and control
Extended temperature range for installation in harsh outdoor environments
Wide AC input operating range for world wide installation requirements

24V-400W model P/N: 0100011-002
48V-650W model P/N: 0100012-002

Environmental

Temperature:
- Operation: -40 to 50˚C (-40 to 122˚F)
- Extended: -40 to 70˚C (-40 to 158˚F), derated power
- Storage: -40 to 85˚C (-40 to 185˚F)
- Humidity: 0 to 95% RH non-condensing
- Altitude: -500 to 3000m (-1640 to 9840ft)
- Heat Dissipation: <110 BTU per hour

Performance / Features

User Interface:
- GUI: Embedded web based GUI accessed via Ethernet using internet browser
- LED: AC mains OK — (Green)
- Minor alarm — (Yellow)
- Major alarm — (Red)

Communication Ports:
- CAN: Smart Peripherals
- Ethernet: 10/100 Base-T for TCIP/SNMP/Email features

System I/O:
- Alarm relays: 1
- Temperature inputs: 2
- Digital inputs: 2
- Voltage input: 1

Agency Compliance

Safety: CSA C22.2 No 60950-1-03
- CE Marked

EMC: ETSI 300 386-2

- 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 CatB3
CORDEX™ HP 300W

48Vdc Modular Integrated Rectifier Shelf System

- High performance delivering up to 18.75A
- 95% efficiency for increased OPEX savings and reduced carbon footprint
- Compact size yields more space for revenue generating equipment
- Wide range AC input for worldwide installation requirements
- Dual front and back DC outputs allow maximum flexibility
- Wide temperature operating range for installation in harsh outdoor and indoor environments

Cordex HP 48-300W Rectifier Shelves

- 19in 1RU Shelf System with controller and distribution
- P/N: 0300072
- Rectifiers: 3 x CXRF HP 48 300W
- Controller: MCU0348
- Distribution: Integrated (4) GMT fuse, battery LVD

Environmental

- Temperature:
  - Standard: -40 to 70°C (-4 to 158°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- Humidity:
  - Operating: 20 to 80% RH non-condensing
  - Storage: 10 to 95% RH non-condensing
- Elevation: Up to 3000m (9842ft)
- Cooling: Fan cooled (front to rear)

Related Components

- Supervisory: 7400325 Comp@s communication card
- Accessories: 0100010-001 Blank plate for rectifier slot
- 8700551 AC line cord

Agency Compliance

- Safety: EN60950
- Environment: IEC 60068-2-27
- EMC: ETSI EN 300 019-1-3 class 3.4
- NEBS: GR-1089-CORE GR-63-CORE

*Consult factory for certification status
CORDEX™ 650W

48Vdc Modular Rectifier Shelf Systems

- Multiple 48V configurations up to 67A for various 48Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Front access options for space restricted enclosures
- Integrated DC system capability with controller and distribution module options

**Mechanical**

**19” Shelf**
- Dimensions:
  - mm: 89H x 435W x 302D
  - inches: 3.5H x 17.1W x 11.9D
- Weight: 6.9kg (15.5lbs)

**23” Front Access Shelf**
- Dimensions:
  - mm: 89H x 544W x 307D
  - inches: 3.5H x 21.42W x 12.0D
  - (excludes optional fan tray and baffle)
- Weight: 16.8kg (37lbs) (fully equipped with four rectifiers)

*Note: Shelf P/Ns DO NOT include modules or distribution breakers*
*Weights DO NOT include modules*
*Dimensions DO NOT include mounting bracket*

**Performance / Features**

**Communication ports:**
- CAN: Interface to control rectifiers. Smart peripherals
- Ethernet: 10/100 Base-T for TCIP/SNMP features

**Environmental**

**Temperature:**
- Standard: -40 to 50°C (-40 to 122°F)
- Storage: -40 to 85°C (-40 to 185°F)

**Humidity:**
- 0 to 95% RH non-condensing

**Elevation:**
- -500 to 3000m (-1640 to 9840ft)

**Cooling:**
- Natural or forced convection, vertical airflow

**Related Components**

Cordex™ 650W 48Vdc rectifier: See page 91
Cordex™ controller CXCI+: See page 80
AM plug-in breakers: See page 119
GMT style fuses: See page 120
CORDEX™ 400W
24Vdc Modular Rectifier Shelf Systems

> Multiple 24V configurations up to 70A for various 24Vdc applications
> Convection cooled design for high reliability in harsh industrial environments
> Wide range AC input for multiple worldwide AC services
> Integrated system capability with shelf controller and DC distribution

Cordex 24-400W Rectifier Shelves

> 19/23 in 2RU universal mount
Cordex™ 1.6kW shelf power system with CXCI+ controller and bullet breaker distribution
P/N: 030-763-20
Rectifiers: 4 x CXRC 24-400W
Controller: 1 x CXCI+
Distribution: (4) AM bullet type breakers

> 19/23 in 2RU universal mount
Cordex™ 2kW bulk power system with CXCI+ controller
P/N: 030-773-20
Rectifiers: 5 x CXRC 24-400W
Controller: 1 x CXCI+
Distribution: Bulk power for external distribution panel

Mechanical

> 19/23” Shelf
Dimensions:
- mm: 89H x 435W x 302D
- inches: 3.5H x 17.1W x 11.9D
- Weight: 6.9kg (15.5lbs)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions DO NOT include mounting bracket

Performance / Features

Communication ports:
- CAN: Interface to control rectifiers, Smart peripherals
- Ethernet: 10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
- Standard: -40 to 50°C (-40 to 122°F)
- Storage: -40 to 85°C (-40 to 185°F)

Humidity:
- 0 to 95% RH non-condensing

Elevation:
- 500 to 3000m (-1640 to 9840ft)

Cooling:
- Natural or forced convection, vertical airflow

Related Components

Cordex™ 400W 24Vdc rectifier: See page 98
Cordex™ controller CXCI+: See page 80
AM plug-in breakers: See page 119
> 83A capacity modular system for various 12Vdc applications
> Convection cooled design for high reliability in harsh industrial environments
> Wide range AC input for multiple worldwide AC services
> Integrated system capability with shelf controller and DC distribution

**Cordex 12-250W Rectifier Shelves**

**19/23in 2RU universal mount**
Cordex™ 1000W shelf power system with CXCI controller and bullet breaker distribution

- **P/N:** 030-770-20
- **Rectifiers:** 4 x CXRC 12-250W
- **Controller:** 1 x CXCI
- **Distribution:** (4) AM bullet type breakers

**Mechanical**

**19” Shelf**
- **Dimensions:**
  - mm: 89H x 435W x 302D
  - inches: 3.5H x 17.1W x 11.9D
- **Weight:** 6.9kg (15.5lbs)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions DO NOT include mounting bracket

**Performance / Features**

**Communication ports:**
- CAN: Interface to control rectifiers, Smart peripherals
- Ethernet: 10/100 Base-T for TCIP/SNMP features

**Environmental**

**Temperature:**
- **Standard:** -40 to 50°C (-40 to 122°F)
- **Storage:** -40 to 85°C (-40 to 185°F)

**Humidity:** 0 to 95% RH non-condensing

**Elevation:** -500 to 3000m (-1640 to 9840ft)

**Cooling:** Natural or forced convection, vertical airflow

**Related Components**

Cordex™ 250W 12Vdc rectifier: See page 100
Cordex™ controller CXCI: See page 80
AM plug-in breakers: See page 119
CORDEX™ 1kW

48Vdc Modular Rectifier Shelf Systems

- Multiple configurations up to 125A for various 48Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system capability with modular controller and DC distribution

**Cordex 48-1kW Rectifier Shelves**

**19/23in center mount**
Cordex™ 5kW bulk power system with plug in controller
P/N: 030-706-20
Rectifiers: 5 x CXRC 48-1kW
Controller: CXCM
Distribution: Bulk power for external distribution panel

**19in flush mount**
Cordex™ 6kW bulk power system
P/N: 030-707-20
Rectifiers: 6 x CXRC 48-1kW
Controller: Requires CXCR rack mount controller
Distribution: Bulk power for external distribution panel

**23in center mount**
Cordex™ 4kW shelf power system with plug in controller and bullet type breaker distribution
P/N: 030-704-20
Rectifiers: 4 x CXRC 48-1kW
Controller: CXCM
Distribution: Integrated plug-in breakers and GMT fuse option

**Mechanical**

**19” & 19/23” Shelf**
Dimensions:
mm: 177H x 444W x 302D
inches: 6.9H x 17.5W x 11.9D
Weight: 7.5kg (16.5lbs)

**23” Shelf**
Dimensions:
mm: 177H x 543W x 302D
inches: 6.9H x 21.4W x 11.9D
Weight: 10.2kg (22.5lbs)

Note: Shelf P/Ns DO NOT include rectifier modules or distribution breakers
Weights DO NOT include modules
Dimensions DO NOT include mounting brackets

**Performance / Features**

**Communication ports:**
CAN: Interface to control rectifiers
Ethernet: 10/100 Base-T for TCIP/SNMP features

**Related Components**

Cordex™ 1kW 48Vdc rectifier: See page 92
AM plug-in breakers: See page 119
GMT style fuses: See page 120
CORDEX™ HP 1.2KW

48Vdc Modular 1RU Rectifier Shelf Systems

- Multiple 48V configurations up to 125A for various 48Vdc applications
- High efficiency design for reduced operating expenses
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services
- Front access options for space restricted enclosures

**Cordex 48-1.2kW Rectifier Shelves**

- **19/23in 1RU shelf system with GMT distribution**
  - P/N: ............................................030-851-20
  - Rectifiers: .........................3 x CXRF HP 48-1.2kW
  - Controller: ......................1 x CXCM1+
  - Distribution:......................(8) GMT fuse, battery shunt, optimal battery LVD

- **19/23in 1RU universal mount (Bulk Power with CXC)**
  - P/N: ............................................030-835-20
  - Rectifiers: .........................4 x CXRF HP 48-1.2kW
  - Controller: ......................1 x CXCM1+
  - Distribution:......................Bulk power for external distribution

- **19/23in 1RU universal mount (Bulk Power)**
  - P/N: ............................................030-845-20
  - Rectifiers: .........................5 x CXRF HP 48-1.2kW
  - Controller: ......................N/A (External)
  - Distribution:......................Bulk power for external distribution

**Mechanical**
- **19/23” Shelf**
  - Dimensions:
    - mm: ..................................................44H x 440W x 305D
    - inches: ........................................1.75H x 17.3W x 12.0D
    - *Note: Rectifier front handle adds additional 12.5mm/0.49” Depth*
  - Weight:
    - Shelf: .........................3.0kg (6.6lbs)
    - Rectifier: ......................1.23kg (2.7lbs)
  - Note: Shelf P/Ns DO NOT include modules or distribution breakers
  - Dimensions do not include mounting bracket

**Performance / Features**

- **Communication ports:** 
  - CAN: Interface to control rectifiers and smart peripherals
  - Ethernet: .....................10/100 Base-T for TCIP/SNMP features

**Environmental**

- **Temperature:**
  - Standard: ......................-40 to 65°C (-40 to 149°F)
  - Extended: .................-40 to 75°C (-40 to 167°F) de-rated output
  - Storage: ......................-40 to 80°C (-40 to 176°F)
  - Humidity: ......................0 to 95% RH non-condensing
  - Elevation: ......................-500 to 2800m (-1640 to 9186ft)
  - Cooling: ......................Fan cooled (front to rear)

**Related Components**

5-15P (120V) line cord, 2.5m .............877-690-19
Blank plate: ..........................747-622-20-000
Kydex rear cover: ......................567-837-19
CXCM1+ I/O terminal block kit: ........036-201-20-000

Cordex HP™ 1.2kW 48Vdc rectifier: See page 93
Cordex™ controller CXCM1+: See page 81
GMT style fuses: See page 120
CORDEX™ HP 1.2KW

48Vdc Front Access Rectifier Shelf System

- Up to 100A capacity @ 48Vdc for various small power applications
- High efficiency design for reduced operating expenses
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services
- Front access options for space restricted enclosures

<table>
<thead>
<tr>
<th>Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
</tr>
<tr>
<td>mm: 88H x 440W x 305D</td>
</tr>
<tr>
<td>inches: 3.5H x 17.3W x 12.0D</td>
</tr>
<tr>
<td>Note: Rectifier front handle adds additional 12.5mm/0.49&quot; Depth</td>
</tr>
<tr>
<td>Mounting: 19&quot; or 23&quot; rack, 6&quot; offset (center), EIA rack spacing</td>
</tr>
<tr>
<td>Weight:</td>
</tr>
<tr>
<td>Shelf: 4.55kg (10lbs)</td>
</tr>
<tr>
<td>Rectifier: 1.23kg (2.7lbs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature:</td>
</tr>
<tr>
<td>Standard: -40 to 65°C (-40 to 149°F)</td>
</tr>
<tr>
<td>Extended: -40 to 75°C (-40 to 167°F) de-rated output</td>
</tr>
<tr>
<td>Storage: -40 to 80°C (-40 to 176°F)</td>
</tr>
<tr>
<td>Humidity: 0 to 95% RH non-condensing</td>
</tr>
<tr>
<td>Elevation: -500 to 2800m (-1640 to 9186ft)</td>
</tr>
<tr>
<td>Cooling: Fan cooled (front to rear)</td>
</tr>
<tr>
<td>Heat dissipation: 1232 BTU hour/system max</td>
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</table>

<table>
<thead>
<tr>
<th>Agency Compliance</th>
</tr>
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<tbody>
<tr>
<td>Safety: CSA C22.2 No 60950-1-03</td>
</tr>
<tr>
<td>CE: EN60950</td>
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<tr>
<td>NEBS: GR-1089-CORE</td>
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<tr>
<td>GR-63-CORE</td>
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<table>
<thead>
<tr>
<th>Related Components</th>
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</thead>
<tbody>
<tr>
<td>5-15P (120V) line cord, 2.5m: 877-690-19</td>
</tr>
<tr>
<td>120/240Vac Universal line cord, flying leads, 3.5m: 877-790-19</td>
</tr>
<tr>
<td>Blank plate: 747-622-20-000</td>
</tr>
<tr>
<td>Cordex HP™ 1.2kW 48Vdc rectifier: See page 93</td>
</tr>
<tr>
<td>Cordex™ controller CXCM1+: See page 81</td>
</tr>
<tr>
<td>GMT style fuses: See page 120</td>
</tr>
</tbody>
</table>
CXPS-E101

Standard 48Vdc Power System

- Integrated 48V system packages in 100A or 225A configurations
- Ultra compact, high density design utilizing standard plug-in circuit breakers
- High efficiency design for reduced operating expenses
- High temperature rated, fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services

**Mechanical**

**CXPS-E101 100A Capacity System Dimensions:**
mm: 90H x 438W x 381D
inches: 3.5H x 17.24W x 15D

**Weight:**
System: 18.3kg (40.4lbs)
Rectifier: 1.2kg (2.7lbs) each

**CXPS-E101 225A Capacity System Dimensions:**
mm: 133H x 438W x 381D
inches: 5.25H x 17.24W x 15D

**Weight:**
System: 21.3kg (47lbs)
Rectifier: 1.2kg (2.7lbs) each

**Mounting:**
19/23" universal mount

**Connections:**
- Load breaker: 10x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: 2x sets, ¼"-20 studs on ⅝" centers
- Return bar: 12x sets, 10-32 studs on ⅝" centers
- Alarm: Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)

**Access:**
Front access for operation and maintenance

**Environmental**

**Temperature:** -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output

**Humidity:** 0 to 95% RH non-condensing

**Elevation:**
-500 to 2800m; to 4000m with temperature de-rated to 40°C (-1640ft to 9186ft; to 13124ft with temperature de-rated to 104°F) with de-rated output

**Related Components**

- Cordex CXRF 48-1.2kW Rectifier Module: 010-619-20-041
- Cordex CXCM1+: 0180030-004
- 5-15P (120V) Line Cord, 2.5M: 877-690-19
- Universal Line Cord, Flying leads, 3.5M: 877-790-19
- Temperature sensor assembly 12ft, ¼" lug: 747-095-20-075
- Blank Plate: 747-622-20-000

**Electrical**

**Input:**
- Voltage: 176 to 312Vac (nominal)
- Current: 7.5A max (176 to 300Vac) per module
- Frequency: 45 to 66Hz
- Efficiency: >93% (50-100% load @ nominal voltage)
- Power factor: >.99

**Output:**
- Current:
  - CXPS-E101 100A
    - Capacity System: 100A max @ 48Vdc (nominal I/P)
  - CXPS-E101 225A
    - Capacity System: 225A max @ 48Vdc (nominal I/P)
    - Rectifier: 25A max @ 48Vdc (nominal I/P)

**Power:**
- 100A System Configuration P/N: 0540569-001
- 225A System Configuration P/N: 0540570-001

**Features**

- CXPS-E101 100A:
  - Up to 4x 48V-1.2kW rectifier positions
- CXPS-E101 225A:
  - Up to 9x 48V-1.2kW rectifier positions
- Distribution:
  - 10x load breaker positions (AM breaker, mid-trip plug-in style)
  - 2x battery breaker positions (AM breaker, series-trip plug-in style)
  - 225A Low voltage disconnect
  - 200A Battery shunt
- Controller:
  - CXCM1+ Modular controller (included)
Integrated 48V, 166A system package
> Ultra compact, high density (HD) design utilizing standard plug-in circuit breakers
> High efficiency design for reduced operating expenses
> High temperature rated, fan-cooled design for harsh outdoor installations
> Wide range AC input and IEC line cords for multiple AC services

P/N: 0540571-001

**Electrical**

**Input:**
- Voltage: 176 to 312Vac (nominal)
- 90 to 176Vac (de-rated O/P power)
- Current: 7.5A max (176 to 300Vac) per module
- 6.0A max (90 to 176Vac) per module
- Frequency: 45 to 66Hz
- Efficiency: >94% (50-100% load @ nominal voltage)
- Power factor: >.99

**Output:**
- System: 166A max @ 48Vdc (nominal I/P)
- 104A max @ 48Vdc (120Vac)
- Rectifier: 41.7A max @ 48Vdc (nominal I/P)
- 26A max @ 48Vdc (120Vac) (de-rated linearly to 18.7A @ 90Vac)

**Power:**
- System: 8000W max @ nominal I/P
- 5000W @ 120Vac
- Rectifier: 2000W max @ nominal I/P
- 1250W @ 120Vac (subject to de-rating below 120Vac)

**Features**

- Rectifier: Up to 4x 48V-2.0kW rectifier positions
- Distribution:
  - 10x load breaker positions (AM breaker, mid-trip plug-in style)
  - 2x battery breaker positions (AM breaker, series-trip plug-in style)
  - 225A Low voltage disconnect
  - 200A Battery shunt
- Controller: CXCI+ Modular controller (included)

**Mechanical**

- **Dimensions:**
  - mm: 133H x 438W x 381D
  - inches: 5.25H x 17.24W x 15D
- **Weight:**
  - System: 21.3kg (47lbs)
  - Rectifier: 2.8kg (6.2lbs) each
- **Mounting:** 19/23” universal mount
- **Connections:**
  - Load breaker: 10x sets, ¼”-20 studs on ⅝” centers
  - Battery breaker: 2x sets, ¼”-20 studs on ⅝” centers
  - Return bar: 12x sets, 10-32 studs on ⅝” centers
  - Alarm: Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- **Access:** Front access for operation and maintenance

**Environmental**

- **Temperature:** -40 to 55°C (-40 to 149°F)
- **Humidity:** 0 to 95% RH non-condensing
- **Elevation:** -500 to 2800m; to 4000m with temperature de-rated to 104°F with de-rated output

**Related Components**

- Cordex CXRF 48-2.0kW Rectifier Module: 010-622-20
- Cordex CXCI+: 7400232-001
- Temperature sensor assembly 12ft, ¼” lug: 747-095-20-072
- Temperature sensor assembly 12ft, ½” lug: 747-095-20-075
- Blank Plate: 613-707-W3
Integrated -48V, 400A power system with front access distribution
Industry leading power system density – 400A, 26 distribution positions in 5RU
Advanced CXC-HP controller with touch screen display for full local control
High temperature rated design for harsh outdoor applications
Wide range AC input for flexible worldwide deployment

Nominal Specifications

<table>
<thead>
<tr>
<th>Part Number</th>
<th>48V-2.0kW Rectifier System</th>
<th>48V-2.4kW Rectifier System</th>
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</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Capacity (max)</td>
<td>333A</td>
<td>400A</td>
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<tr>
<td>Operating Voltage</td>
<td>187 to 277 Vac (Nominal)</td>
<td>187 to 277 Vac (Nominal)</td>
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<tr>
<td>Extended (High)</td>
<td>277 to 312 Vac</td>
<td>277 to 310 Vac</td>
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<tr>
<td>Extended (Low)</td>
<td>90 to 187 Vac (de-rated O/P power)</td>
<td>90 to 187 Vac (de-rated O/P power)</td>
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<tr>
<td>Efficiency</td>
<td>&gt;94.2% Peak efficiency</td>
<td>&gt;96% Peak efficiency</td>
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<td><strong>Input</strong></td>
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<tr>
<td>Current per module</td>
<td>41.7A @ 48Vdc (nominal I/P)</td>
<td>50A @ 48Vdc (nominal I/P)</td>
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<tr>
<td>Rectifier Positions</td>
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<td>19&quot; System: Up to 8 rectifiers</td>
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<tr>
<td></td>
<td>23&quot; System: Up to 5 rectifiers</td>
<td>23&quot; System: Up to 10 rectifiers</td>
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<td><strong>Output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>Flush/Center</td>
<td>Flush/Center</td>
</tr>
<tr>
<td>Dimensions</td>
<td>8.75&quot;H x 19&quot;W x 12&quot;D</td>
<td>8.75&quot;H x 19&quot;W x 17&quot;D</td>
</tr>
<tr>
<td>Hot Positions</td>
<td>21x Load Brkrs (or) 16 Load + 5 Battery Brkrs</td>
<td>21x Load Brkrs (or) 16 Load + 5 Battery Brkrs</td>
</tr>
<tr>
<td>Return Positions</td>
<td>21x sets of ¼&quot; Studs on ½&quot; Centers</td>
<td>21x sets of ¼&quot; Studs on ½&quot; Centers</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
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<tr>
<td>Mounting</td>
<td>Flush/Center</td>
<td>Flush/Center</td>
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<tr>
<td>Dimensions</td>
<td>8.75&quot;H x 23&quot;W x 12&quot;D</td>
<td>8.75&quot;H x 23&quot;W x 17&quot;D</td>
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<tr>
<td>Hot Positions</td>
<td>26x Load Brkrs (or) 21 Load + 5 Battery Brkrs</td>
<td>26x Load Brkrs (or) 21 Load + 5 Battery Brkrs</td>
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<tr>
<td>Return Positions</td>
<td>26x sets of ¼&quot; Studs on ½&quot; Centers</td>
<td>26x sets of ¼&quot; Studs on ½&quot; Centers</td>
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<tr>
<td><strong>Environmental</strong></td>
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<tr>
<td>Temperature</td>
<td>-40 to 55°C (-40 to 131°F)</td>
<td>-40 to 55°C (-40 to 131°F)</td>
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<tr>
<td>Humidity</td>
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<td>0 to 95% RH non-condensing</td>
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<tr>
<td>Elevation</td>
<td>-500 to 2000m (-1640 to 6600ft) with de-rated output</td>
<td>-500 to 2000m (-1640 to 6600ft) with de-rated output</td>
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<td><strong>Certifications</strong></td>
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<tr>
<td>Safety</td>
<td>CSA C22.2 No. 609050-1-03</td>
<td>CSA C22.2 No. 609050-1-03</td>
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</tbody>
</table>
600A – 2000A Power System

-48V power solution for Cell Site, CO, MSC, Data Center and Cable Headend facilities
- Each 1200A bay combines rectifiers, battery termination and distribution, simplifying installation
- Dual voltage options use high efficiency DC to DC converters for legacy cell site applications
- High efficiency modular rectifiers reduce operating costs
- Compact front access design reduces floor space footprint
- Flexible low voltage load or battery disconnect, circuit breaker, TPS and TPL fuse options

Consult your Alpha representative for P/N configurations

Output Voltage:
Primary: 48V
Secondary: +24V

AC Input:
4.0kW Rectifier Shelf: 6x 30A, Single Phase, 208 to 277Vac
2x 50A, 3 Phase, 208Vac (w/o neutral)
2x 30A, 3 Phase, 277/480Vac (w/ neutral)
2.4kW Rectifier Shelf: 3x 40A, Single Phase, 208 to 277Vac

System Ampacity Ratings (Continuous)
1 Tier System Bus Capacity: 600A
2 Tier System Bus Capacity: 1200A
3 Tier System Bus Capacity: 1200A (or) 1800A
4 Tier System Bus Capacity: 1200A (or) 2000A

Fuses

 GMT: 30A, 10 positions (15A max. fuse)
 TPL (HC\*): Up to 8 positions in a 4T Distribution, (800A max. fuse)
 TPL (LC\*): Up to 16 positions in a 4T Distribution, (400A max. fuse)
 TLS/TPS Plug-In bullet: Up to 96 positions

Breakers

 High Capacity Plug-In Bullet: Up to 96 positions in a 4T Distribution
 High Capacity Bolt-In: Up to 26 positions in a 4T Distribution

Output Termination

 GMT Fuse: 0.34 to 2.5mm² (14 to 22AWG)
 TPL (HC\*) fuse: 2x ¼” studs on 1” centers (Up to 2x 750 MCM Cables)
 TPL (LC\*) fuse: 1x ¼” studs on 1” centers (Up to 1x 750 MCM Cables)
 218 Style Bolt-In: 1x ¼” studs on 1” centers (Up to 1x 750 MCM Cables)

System Level Alarms & Controls

Alarms/control parameters are user-programmable through built-in digital supervisory unit. See Cordex HP datasheet for detailed information on alarms and controls.

Indicators: LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Alarm Connections: >0.34 to 2.5mm² (14 to 22AWG)

Mechanical

Mounting: Standard center mount 23” relay rack
23” Dimensions: mm: 2133H x 660W x 560D
inches: 84H x 26W x 22D

Weight:
System: 227kg (500lbs) approx
4.0kW Rectifier: 8.5kg (19lbs) per module
2.4kW Rectifier: 1.76kg (3.9lbs) per module

Environmental

Temperature: 0 to 40°C (32 to 104°F)
Humidity: 0 to 95% RH non-condensing
Elevation: -500 to 2800m (-1640 to 9186ft)

Agency Compliance

Safety: CSA C22.2 No. 60950-1-03
-48V distributed power solution for CO's, MSC's, Data Center and Cable Headend facilities (DPCO)

Each 2500A bay combines rectifiers, battery termination and distribution
Dual bay kit links two 2500A bays doubling capacity, breakers and termination
High efficiency modular rectifiers reduce operating costs
Flexible low voltage load disconnect, circuit breaker, TPS and TPL fuse options

Environmental

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-40°C to 104°F</td>
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<tr>
<td>Humidity</td>
<td>0% to 95% RH non-condensing</td>
</tr>
<tr>
<td>Elevation</td>
<td>-1640 ft to 9186 ft</td>
</tr>
</tbody>
</table>

Related Components

Cordex HP 48-4kW rectifier
For more detailed information see page 96
System level alarms/controls
Alarms/control parameters are user-programmable through built-in digital supervisory unit.

Indicators: LCD with touch screen
- System OK (green LED)
- System minor alarm (yellow LED)
- System major alarm (red LED)

Load disconnect: Fuse/CB panel mounted option
- TPL + bolt-in panel 2000A rated
- Bullet breaker panel 600A rated

Alarm:
- Connections: 0.34 to 2.5mm² (14 to 22AWG)

Smart peripheral modules:
- Shunt multiplexer: 16 shunts per module (up to 2 modules per bay)

Remote hot bar:
- Mounting: 16 shunt "input" per module
- Termination: 124 sets of 2 hole ¼" dia. on 1½" centers or ⅜" dia. on 1" centers
- Unit Capacity: 5,000A per bar
- Ultimate Capacity: 2 bar limit (10,000A)

Remote return bar:
- Mounting: 2" Auxiliary framing (customer supplied)
- Termination: 124 sets of 2 hole ¼" dia. on 1½" centers or ⅜" dia. on 1" centers
- Unit Capacity: 2,500A per bar
- Ultimate Capacity: 4 bar limit (10,000A)

Agency Compliance

Safety: CAN/CSA C22.2 No. 60950-1-07+
- AMD 1:2011
- ANSI/UL 60950-1:2011

NEBS: Level 3 compliant
CXPS-C 48-10000
48V High Capacity Centralized Power System

- 48V 10,000A centralized power solution for MSC, CO, Data Center and Cable Headend facilities
- High efficiency Cordex modular rectifiers reduce operating costs
- Flexible circuit breaker, TPS and TPL fuse options designed to feed equipment or remote BDFBs
- Compact footprint dramatically reduces floor space requirements
- Internal Bay-to-Bay copper busswork and easy access to connections simplify installation and serviceability
- Expandable power and distribution bays allow for easy and cost effective modular growth

Consult your Alpha representative for P/N configurations

Electrical

Rectifier shelf AC input: 3 Phase, 208 to 240Vac (w/o neutral), 8 x 100A feeds per rectifier bay, 3 Phase, 360 to 480Vac (with neutral), 8x 50A feeds per rectifier bay, 16 x 50A feeds, 16 x 30A feeds

Rectifier voltage: 208 to 277Vac
Bus capacity: 4,000A, 8,000A, 12,000A
Rectifier bay capacity: 2,000A or 4,000A
Distribution bay capacity: 6,000A
Max. rectifier capacity: 10,000A

Distribution Bay

Each distribution bay may be equipped with a variety of different fuse/CB panels.

TPL fuses:
- 61-800A
- 4 fuse holders per panel
- 6 fuse panels per bay

TPS/TLS fuses:
- Up to 125A
- 18 fuse holders per panel
- 12 fuse panels per bay

Bolt-in breakers:
- 1 pole up to 250A
- 3 pole 450 to 600A
- 5 pole 850 to 1000A
- 12 breaker poles per panel

2 pole 275 to 400A
- 4 pole 650 to 800A
- 6 pole 1050 to 1200A
- 6 fuse panels per bay

Plug-in bullet breakers:
- 1 pole up to 125A
- 3 pole up to 250A
- 12 panels per bay

2 pole up to 200A
- 18 breaker poles per panel

Mechanical

Enclosure: 1.095mm (14 gauge) steel
Mounting: Standard 23" relay rack (flush rack mount) in box bay

Dimensions:
- cm: 213H x 71W x 71D
- inches: 84H x 28W x 28D

Weight:
- Rectifier bay: Approx. 272kg (600lbs) per bay (no rectifiers)
- Distribution bay: Approx. 454kg (1000lbs) per bay

Environmental

Temperature: 0 to 60°C (32 to 122°F)
Humidity: 0 to 95% RH non-condensing
Elevation: -500 to 2800m (-1640 to 9186ft)

Performance / Features

System level alarms/controls
Alarms/control parameters are user-programmable through built-in digital supervisory unit. See Cordex datasheet for detailed information on alarms and controls.

Indicators:
- LCD with touch screen
- System OK (green LED)
- System minor alarm (yellow LED)
- System major alarm (red LED)
- Load disconnect:

Load disconnect: Fuse/CB panel mounted option
Alarm:
- Connections: 0.34 to 2.5mm² (14 to 22AWG)

Related Components

Smart peripheral modules:
- Shunt multiplexer: 16 shunts per module

Remote return bar:
- Mounting: 2" Auxiliary framing (customer supplied)
- Termination: 124 sets of 2 hole 1/4" dia. on 1¼" centers or 3/8" dia. on 1" centers
- Unit capacity: 4,000A per bar
- Ultimate capacity: 3 bar limit (12,000A)

Agency Compliance

Safety: CSA C22.2 No. 609050-1-03
NEBS: Level 3 compliant
CORDEX™
3.3kW SYSTEM

125/220V High Voltage Integrated Systems

- 125/220Vdc 3.3kW capacity solution for industrial and utility applications
- Convection cooled design for high reliability in industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system solution with CXC controller and distribution

### 125V P/N: 030-788-20
220V P/N: 030-789-20

#### Electrical

**Input voltage:**
- Nominal: 208 to 277Vac
- Operating: 176 to 320Vdc
- Extended: 176 to 150Vac (de-rated to 75%)

**Phase:**
- 1 or 3

**Frequency:**
- 45 to 66Hz

**Power factor:**
- >0.99

**Efficiency:**
- >93% (50 to 100% load)

**Output voltage:**
- 90 to 160Vdc

**Current:**
- 8.8A per module @ 125Vdc,
- 5A per module @ 220Vdc,
- up to 3 modules per shelf

**Load regulation:**
- Static: <+0.5%

**Line regulation:**
- Static: <+0.1%

**Transient response:**
- <+2% for 10 to 100% load step,
- 10ms recovery time.

**Wide band noise:**
- <10mVrms
- <80mVp-p

**Insulation:**
- 2.5kVac input-earth
- 3kVac input-output
- 2kVac output-earth
- 0.5kVac signals-earth

#### Performance / Features

**User interface:**
- **GUI:** Use web browser to access GUI through ethernet or RS-232 port
- **Display:** Full graphic LCD, 160 x 160 pixels, with backlight and contrast adjustment
- **Controls:** LCD touch screen with virtual alpha numeric and numeric keyboards
- **Indicators:** System OK (green LED), Minor alarm (yellow LED), Major alarm (red LED)
- **Audio:** Built in speaker for alarms and messages
- **Language:** Multi language support including Chinese

**Communication ports:**
- RS-232 (DB-9): Craft port on front panel for local PC connection
- CAN OUT (RJ-12 offset): CAN communication BUS to optional smart peripheral modules
- RS-485 (RJ-12 offset): For future service options
- Ethernet (RJ-45): 10/100 Base T with half/full duplex

**Alarms:**
- Output: 6 form C contacts
- Input: 4 digital inputs
- GFD: Ground fault detect
- SNMP: SNMP agent provides real time system status to the network management software

**DC output panel:** 2 x 2 Pole, 32A breakers (10KAIC) with alarm monitoring

**AC Input (not a service entrance):**
- Single phase: 1 x 2-pole 10KAIC (30KAIC option)
- Three phase: 1 x 3-pole delta connection 10KAIC
- 1 x 3-pole wye connection 10KAIC

#### Mechanical

**Charger enclosure:** Wall or rack mount

**Dimensions:**
- mm: 309H x 434W x 302D
- inches: 12.2H x 17.1W x 11.9D

**Weight:** 12.59kg (27.76lbs)*

**Enclosure:** NEMA 1 (charcoal finish)

#### Environmental

**Temperature range:**
- Operating: -40 to 50˚C (-40 to 122˚F)
- Extended: Rectifier de-rated to 600W @ 65˚C (149˚F)

**Humidity:** 0 to 95% RH non-condensing

**Cooling:** Natural convection

**Heat dissipation:** <900 BTU per hour/system

#### Agency Compliance

**Safety:** CSA C22.2 No. 60950-00 3rd edition

**CE**

**EMC:** ICES-003 Class A
- FCC Part 15, Class A, FCC Part 68
- EN 55022 Class A (CISPR 22)
- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 EFRT/Burst
- EN 61000-4-6 Conducted Immunity

*Rectifier module not included in system weight*
CXPS 380 → 48i

380-48Vdc-8kW DC-DC Converter System

> Modular DC-DC converter system that produces a 48Vdc output from a 380Vdc source
> 150A power system with front access distribution
> High temperature rated, fan-cooled design

P/N: 0540398-001

Electrical

Input:
Voltage: ................. 380Vdc (nominal)
260 to 400Vdc (operating)
Current: ................. 5.6A @ 380Vdc (8.2A max @ 260Vdc)
Efficiency: ................. >94.3 @ 40-80% load

Output:
Current:
System: .................. 167A max @ nominal I/P
Converter: ................. 41.7A @ 48Vdc (nominal I/P)
Power:
System: .................. 8000W max @ nominal I/P
Converter: ................. 2000W max @ nominal I/P

Performance / Features

Converters: .................. Up to 4x converter positions
Distribution:
• 14x load breaker positions (mid-trip, plug-in style)
• 4x battery breaker positions (series-trip, plug-in style)
• Low voltage disconnect
• Shunt
Controller: .................. CXCI+ integrated controller

Mechanical

Dimensions:
mm: .................. 222H x 438W x 305D
inches: .................. 8.75H x 17.24W x 12D

Weight:
System: .................. 19kg (42lbs)
Converter: ................. 2.3kg (5.1lbs) each
Mounting: .................. 19/23" universal mount (center or flush)

Connections:
Load breaker: ................. 14x sets, ¼"-20 studs on ¾" centers
Return bar: .................. 18x sets, ¼" holes on ¾" centers
Input connectors: .......... 4x Anderson Saf-D grid receptacle
Alarm: .................. Screw terminal 1.31mm² to 0.128mm²
(#16 to #26 AWG)
CXCI+ input: ................. 25-pin D-Sub cable
Access: .................. Front access after installation

Environmental

Temperature: ................. -40 to 55°C (-40 to 131°F)
-40 to 75°C (-40 to 167°F) de-rated output
-1800W @ 65°C (149°F)
Humidity: .................. 0 to 95% RH non-condensing
Elevation: .................. -500 to 2000m (-1640 to 6600ft)
-500 to 4000m (-1640 to 13100ft)
with de-rated output

Related Components

CXDF 380-48/2kW converter: See page 106
Cordex™ controller CXCI+: See page 80
AM plug-in breakers: See page 119
Indoor Seismic Racks

Alpha’s line of indoor, two-post seismic racks are Zone 4 rated and independently certified for NEBS Level 3. They can hold up to 3000 pounds of equipment in a small footprint, making them ideal for use in telecommunication shelters, cabinets and Central Office applications.

The Alpha battery rack is the most robust Zone 4 rack in the industry, accommodating up to 3000 pounds in a single two-post relay rack footprint. The ability to hold twelve 24V strings of batteries dramatically reduces capex by minimizing the number of racks required. The racks also simplify installation and maintenance. The battery trays are pre-wired, which shortens the initial installation time, and easy removal of the battery tray front guard facilitates quick battery change outs.

The seismic rack is offered in a variety of heights and widths, allowing it to be used for a wide range of customer applications. And the bolt-together approach enables the rack to be flat packed, which significantly simplifies shipping and storage costs and logistics. For Zone 4 applications, the Alpha battery rack is the perfect fit for use with power systems and battery cabinets.
BATTERY RACK

3000lb Seismic Battery Rack System

- Zone 4 rated seismic battery rack system
- NEBS L3 Certification up to 3000lbs
- Total system capacity of 1000A
- Small standard two-post power system footprint
- Pre-wired and ready to install
- Easy removal of front guard facilitates efficient battery change out
- Vertical bus bars provide a neat and clean finish (avoiding tie wraps)
- Built-in 1200A shunt enables users to read total battery current

### Standard Systems

#### Battery Racks (black, 23" rated at 3000lbs)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Voltage</th>
<th>No. of Trays</th>
<th>Breaker Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0912001-001</td>
<td>48V Pos.Gnd</td>
<td>5</td>
<td>100A</td>
</tr>
<tr>
<td>0912001-002</td>
<td>48V Pos.Gnd</td>
<td>5</td>
<td>125A</td>
</tr>
<tr>
<td>0912001-003</td>
<td>48V Pos.Gnd</td>
<td>5</td>
<td>150A</td>
</tr>
<tr>
<td>0912001-004</td>
<td>48V Pos.Gnd</td>
<td>5</td>
<td>200A</td>
</tr>
<tr>
<td>0912001-005</td>
<td>48V Pos.Gnd</td>
<td>5</td>
<td>250A</td>
</tr>
<tr>
<td>0912002-001</td>
<td>24V Neg.Gnd</td>
<td>5</td>
<td>100A</td>
</tr>
<tr>
<td>0912002-002</td>
<td>24V Neg.Gnd</td>
<td>5</td>
<td>125A</td>
</tr>
<tr>
<td>0912003-001</td>
<td>48V Pos.Gnd</td>
<td>6</td>
<td>100A</td>
</tr>
<tr>
<td>0912003-002</td>
<td>48V Pos.Gnd</td>
<td>6</td>
<td>125A</td>
</tr>
<tr>
<td>0912003-003</td>
<td>48V Pos.Gnd</td>
<td>6</td>
<td>150A</td>
</tr>
<tr>
<td>0912003-004</td>
<td>48V Pos.Gnd</td>
<td>6</td>
<td>200A</td>
</tr>
<tr>
<td>0912004-001</td>
<td>24V Neg.Gnd</td>
<td>6</td>
<td>100A</td>
</tr>
</tbody>
</table>

Note: For standalone rack with cable tie brackets, order part# 0300163-001

#### Accessories (for racks listed above)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0380042-021</td>
<td>NA</td>
<td>Mounting Kit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: Seismic Kit includes seismic anchors and washers</td>
</tr>
<tr>
<td>0380195-001</td>
<td>23&quot;</td>
<td>Insulation Kit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: Includes insulation pad and bushings</td>
</tr>
<tr>
<td>5610292-001</td>
<td>23&quot;</td>
<td>Top Cover</td>
</tr>
</tbody>
</table>

### Electrical

- **System capacity:** 1000A max. per bay
- **System voltage:** 48V (or) 24V
- **Overcurrent protection:** Options for 100A, 125A, 150A, 200A and 250A breakers

### Mechanical

- **Mounting:** Standard 23" relay rack mounting options
- **23" Dimensions:**
  - mm: 2133H x 713W x 561D
  - inches: 84H x 28.1W x 22.1D
- **Weight (one bay):**
  - 5 tray: 650lbs
  - 6 tray: 700lbs

### Environmental

- **Temperature:** 0 to 40°C (32 to 122°F)
- **Humidity:** 0 to 95% RH non-condensing
- **Elevation:** -500 to 2800m (-1640 to 9186ft)

### Agency Compliance

- **Safety:** CAN/CSA C22.2 No. 60950-1-07+ AMD 1:2011
  - ANSI/UL 60950-1:2011
- **NEBS:** Level 3 certification
SEISMIC RACK

Modular Two-Post Relay Rack

- Modular two-post seismic relay rack
- Available in standard 23" or 19" mounting options
- Up to 1500lb zone 4 seismic rating
- Up to 3000lb static load capacity
- Bolt together design facilitates flat packing of racks
- Available in multiple heights
- Wide variety of termination panels, battery accessories and distribution option are available

### Standalone Racks

#### 23" Seismic Rack, black (gray)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Height</th>
<th>Dynamic Rating (GR63)</th>
<th>Static Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300063-003 (-013)</td>
<td>3.5'</td>
<td>500lbs</td>
<td>1000lbs</td>
</tr>
<tr>
<td>0300047-001 (-011)</td>
<td>7'</td>
<td>1500lbs</td>
<td>3000lbs</td>
</tr>
<tr>
<td>0300047-002 (-012)</td>
<td>7'</td>
<td>1000lbs</td>
<td>2000lbs</td>
</tr>
<tr>
<td>0300047-003 (-013)</td>
<td>7'</td>
<td>500lbs</td>
<td>1000lbs</td>
</tr>
<tr>
<td>0300064-001 (-011)</td>
<td>7’6”</td>
<td>1500lbs</td>
<td>3000lbs</td>
</tr>
<tr>
<td>0300065-001 (-011)</td>
<td>8’</td>
<td>1500lbs</td>
<td>3000lbs</td>
</tr>
<tr>
<td>0300066-001 (-011)</td>
<td>9’</td>
<td>1500lbs</td>
<td>3000lbs</td>
</tr>
</tbody>
</table>

#### 19" Seismic Rack, black (gray)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Height</th>
<th>Dynamic Rating (GR63)</th>
<th>Static Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300062-001 (-011)</td>
<td>7'</td>
<td>1500lbs</td>
<td>3000lbs</td>
</tr>
<tr>
<td>0300062-002 (-012)</td>
<td>7'</td>
<td>1000lbs</td>
<td>2000lbs</td>
</tr>
<tr>
<td>0300062-003 (-013)</td>
<td>7’</td>
<td>500lbs</td>
<td>1000lbs</td>
</tr>
</tbody>
</table>

#### 23" Seismic Battery Rack, black*

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Height</th>
<th>Dynamic Rating (GR63)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300163-001</td>
<td>7’</td>
<td>2400lbs</td>
</tr>
</tbody>
</table>

*Welded rack which cannot be used in ‘flat pack’ applications

### Accessories

#### Mounting Kit

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
</table>
| 0380042-021 (black) | NA | Seismic kit includes:
| 0380042-022 (gray)   | NA | - seismic anchors and washers |

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5900708-001</td>
<td>NA</td>
<td>Rack joining bracket (require 2 per rack)</td>
</tr>
<tr>
<td>5901537-001</td>
<td>30”</td>
<td>Extension base (clips to the base front)</td>
</tr>
</tbody>
</table>

#### Insulation Kit

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0380063-001</td>
<td>23”</td>
<td>Includes insulation pad and bushings</td>
</tr>
<tr>
<td>0380108-001</td>
<td>19”</td>
<td>Includes insulation pad and bushings</td>
</tr>
</tbody>
</table>

#### Seismic Battery Tray (does not include breaker housing)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300061-003 (black)</td>
<td>23”</td>
<td>Fits most batteries (4 per tray)</td>
</tr>
<tr>
<td>0300061-013 (gray)</td>
<td>23”</td>
<td>Fits most batteries (4 per tray)</td>
</tr>
</tbody>
</table>
| 0300077-002 (black) | 19”   | Designed for the following batteries (4 per tray):
| 0300077-012 (gray) | 19”   | - Exide/GNB Marathon M12V90FT
|                   |       | - C&D Technologies TEL 12-115 FNG
|                   |       | - East Penn 12AVR100-3ET |

#### Breaker Housing, rack mount or left/right mount on battery tray*

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Width</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0380128-001 (black)</td>
<td>NA</td>
<td>AM breakers, single-pole GJ</td>
</tr>
<tr>
<td>0380129-001 (gray)</td>
<td>NA</td>
<td>AM breakers, single-pole GJ</td>
</tr>
</tbody>
</table>

*AM/GJ breakers are not included
Line Powering Solutions

Alpha offers an extensive assortment of line power products that are reliable, field proven options for remote network powering. Using an elevated DC voltage to transmit power long distances over twisted pair copper infrastructure, these converters are a great solution for remote site powering where AC utility is not available, or battery maintenance is cost prohibitive. Alpha’s line power converters feature built-in current limiting and ground-fault protection to ensure the highest level of safety for technicians. Alpha’s line power converters have been used to power remote DSLAMs, mini-DSLAMs Fiber to the Home ONTs (Optical Network Terminals, iDAS and WiFi networks equipment), enabling carriers to capitalize on the low cost and maintenance of a centralized battery plant.

Alpha’s flagship LPS36 system offers best in class density and efficiency, with mounting options that suit Central Office or remote cabinet applications. The LPS36 converts -48 volts to ±190Vdc. It is complemented by the CSM46 and CSM56, downconverters that transform the elevated voltage back to -48Vdc for powering the remote electronics. We have also launched a series of Downconverter modules, as well as sealed up and down converters for installation in harsh environments.

For indoor applications, such as Indoor Distributed Antenna Systems (iDAS), Alpha developed the eLimiter™, a line power device that distributes safe 48V power over copper cables to enable indoor DAS providers to power distant nodes up to 1500 feet from the host without the cost and maintenance of UPS’s and batteries scattered throughout the facility.
Cordex™ HP LPS36

-48Vdc to ±190Vdc Line Power System

> Modular line powering system designed for remotely powering network equipment over twisted copper lines
> High efficiency >92% for increased OPEX savings and reduced carbon footprint
> High temperature tolerance for installation in Central Office or harsh OSP cabinet environments
> Industry leading power density enabling up to 48 channels in a compact 2RU footprint

**P/N: 0120011-001**

**Electrical**

- **Input voltage:** -40 to -60Vdc
- **Output voltage:** ±190Vdc
- **Power:** 96W nominal per output
  >92W worst case conditions
  (4 outputs per module)
- **Efficiency:** >92%
- **Regulation:** <0.5% no load to full load
  <±0.05% line
- **Noise:**
  - Wide band: <500mV RMS (10kHz to 10MHz)
  - <2.5V pk to pk (10kHz to 100MHz)
- **Acoustic:** <60dBa @ 1m (3ft), 55C

**Performance / Features**

- **Communication ports:**
  - CAN: Smart Peripherals
  - Ethernet: 10/100 Base-T for TCIP/SNMP features
- **Alarm relays:**
  - Form C major
  - Form C minor
- **Tri Color LED:**
  - System ok (green)
  - Minor alarm (yellow)
  - Major alarm (red)

**Mechanical**

- **Quad Output Power Module**
  - **Dimensions:**
    - mm: 86H x 35W x 283D
    - inches: 3.4H x 1.4W x 11.1D
  - **Weight:** 0.61kg (1.4lbs)

**Environmental**

- **Temperature:**
  - Operation with forced air cooling: -40 to 65°C (-40 to 149°F) with minimum cabinet air flow @ 200LMF
  - Operation with convection cooling: -40 to 45°C (-40 to 122°F) single shelf operation only or separated by 1RU baffle
- **Storage:** -40 to 85°C (-40 to 185°F)
- **Humidity:** 0 to 95% RH non-condensing
- **Elevation:** -500 to 2800m (-1640 to 9186ft)
- **Heat Dissipation:** <118 BTU per hour/module

**Agency Compliance**

**Safety:** CSA/UL 60950-1
- **EMC:** ETSI 300 386
- **Emissions:**
  - CFR47 (FCC) Part 15 Class A
  - ICES-003 Class A
- **Immunity:**
  - EN 61000-4-2
  - EN 61000-4-4
  - EN 61000-4-6
  - ANSI / IEEE C62.41 CatB3
- **NEBS/Telcordia:**
  - GR-1089-CORE - Class A2
  - GR-63-CORE
  - GR-3108-CORE

**Related Components**

- CXCI+ controller: 7400232-001
- Blanking plate kit (2 items): 0380070-001
Cordex™ HP LPS04

-48Vdc to ±190Vdc Quad Line Power Up-Converter Unit

- Providing four (4) ±190Vdc line powering RFT-V channels with current limiting and ground fault protection
- 92% efficiency for decreased OPEX savings and reduced carbon footprint
- High reliability, rugged and sealed enclosure for installation either inside or outside power cabinets
- Wide operating temperature range for deployment in harsh OSP environments

P/N: 0120037-001

Electrical

- Input voltage: -40 to -60Vdc
- Output voltage: ±190Vdc
- Number of outputs: 4
- Power: 96W nominal per output (4 outputs per unit)
- Output current: Maximum 254 mA per output
- Efficiency: >92%

- Regulation: <2% no load to full load
- <1% line

- Noise:
  - Wide band: <500mV RMS (10kHz to 10MHz)
  - <2.5V pk to pk (10kHz to 100MHz)

Performance / Features

- Alarm relays: Form C
- LED:
  - System ok (green)
  - Minor alarm (yellow)
  - Major alarm (red)

Mechanical

- Dimensions:
  - mm: 142H x 305W x 54D
  - inches: 5.6H x 12W x 2.1D
  - Weight: 2.9kg (6.5lbs)

- Connections: Two (2) blunt cut cables

Environmental

- Temperature:
  - Operation: -40 to 65°C (-40 to 149°F)
  - Storage: -40 to 85°C (-40 to 185°F)

- Environmental Protection: IP54
- Humidity: 5 to 100% RH
- Elevation: -500 to 2800m (-1640 to 9186ft)

Agency Compliance

- Safety:
  - IEC/CSA/UL 60950-1
  - IEC/CSA/UL 60950-21 (RFT-V circuit)
  - IEC/CSA 1UL 60950-22
  - CSA 94.07/UL 50E
  - GR-1089-COR Class A

- EMC:
  - CFR47 (FCC) Part 15 Class A
  - ETSI EN 300 386
  - EN 55022 Class A
LPR48-150 IP68

±190Vdc to -48Vdc Dual Line Powering Remote Down-Converter Unit

Providing up to 150W output at 54Vdc to power remote nodes
IP68 rugged, sealed unit for installation either inside or outside power cabinets
Wide operating temperature range for deployment in harsh OSP environments
Built-in power holdup ensures remote equipment may ride through line surges

P/N: 0120048-001

Electrical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>200 to 380Vdc (±100 to ±190Vdc)</td>
</tr>
<tr>
<td>Number of inputs</td>
<td>2</td>
</tr>
<tr>
<td>Output voltage</td>
<td>-50 to -55Vdc (full load to no load)</td>
</tr>
<tr>
<td>Power</td>
<td>up to 150W (de-rates with input voltage)</td>
</tr>
<tr>
<td>Output current</td>
<td>3.0A (de-rates with input voltage)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt;88%</td>
</tr>
<tr>
<td>Electrical noise</td>
<td>&lt;100mVRMS to 20MHz (wide band)</td>
</tr>
<tr>
<td></td>
<td>&lt;500mVp-p to 20MHz</td>
</tr>
</tbody>
</table>

Performance / Features

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm relay</td>
<td>Form C</td>
</tr>
</tbody>
</table>

Mechanical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>140H x 255W x 70D</td>
</tr>
<tr>
<td>Weight</td>
<td>1.89kg (4.2lbs)</td>
</tr>
<tr>
<td>Connections</td>
<td>Three blunt cut cables (input, output and alarm)</td>
</tr>
</tbody>
</table>

Environmental

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-40 to 65°C (-40 to 149°F)</td>
</tr>
<tr>
<td>Storage</td>
<td>-40 to 85°C (-40 to 185°F)</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>IP68</td>
</tr>
<tr>
<td>Humidity</td>
<td>5 to 100% RH</td>
</tr>
<tr>
<td>Elevation</td>
<td>-500 to 2900m (-1640 to 9186ft)</td>
</tr>
</tbody>
</table>

Agency Compliance

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>CSA/UL 60950-1</td>
</tr>
<tr>
<td></td>
<td>CSA/UL 60950-21 (RFT-V circuit compatible)</td>
</tr>
<tr>
<td></td>
<td>CSA/UL 60950-22</td>
</tr>
<tr>
<td>EMC</td>
<td>LPR48 (FCC) Part 15 Class B</td>
</tr>
<tr>
<td></td>
<td>EN 55022 Class B</td>
</tr>
</tbody>
</table>
±190Vdc to -48Vdc Converter

- ±190V to 48V DC-DC Down Converter for remote/line powering applications (RFT-V)
- Utilize existing copper pair network for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote site
- High reliability convection-cooled design and compact 1RU footprint

**P/N: 012-554-20**

<table>
<thead>
<tr>
<th><strong>Electrical</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input voltage:</strong></td>
</tr>
<tr>
<td><strong>Input current:</strong></td>
</tr>
<tr>
<td><strong>Efficiency:</strong></td>
</tr>
<tr>
<td><strong>Output power:</strong></td>
</tr>
<tr>
<td><strong>Output voltage:</strong></td>
</tr>
<tr>
<td><strong>Output current:</strong></td>
</tr>
<tr>
<td><strong>Noise:</strong></td>
</tr>
</tbody>
</table>

**Performance / Features**

<table>
<thead>
<tr>
<th><strong>LED:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter A:</td>
</tr>
<tr>
<td>Converter B:</td>
</tr>
<tr>
<td>Test points:</td>
</tr>
<tr>
<td>Converter A:</td>
</tr>
<tr>
<td>Converter B:</td>
</tr>
<tr>
<td><strong>Protection:</strong></td>
</tr>
<tr>
<td>Input fuses</td>
</tr>
<tr>
<td>Input current limit</td>
</tr>
<tr>
<td>Input transient protection</td>
</tr>
<tr>
<td>Input high and low voltage shutdown</td>
</tr>
<tr>
<td>Thermal shutdown</td>
</tr>
<tr>
<td>Output parallel diodes</td>
</tr>
<tr>
<td>Output OVP</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
</tr>
<tr>
<td><strong>Miscellaneous:</strong></td>
</tr>
<tr>
<td>Alarm masking switch for disabling shelf level alarming</td>
</tr>
</tbody>
</table>

**Mechanical**

<table>
<thead>
<tr>
<th><strong>Dimensions:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>mm:</td>
</tr>
<tr>
<td>inches:</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
</tr>
</tbody>
</table>

**Environmental**

<table>
<thead>
<tr>
<th><strong>Temperature:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 to 75°C (-40 to 167°F) with external airflow</td>
</tr>
<tr>
<td><strong>Humidity:</strong></td>
</tr>
</tbody>
</table>

**Shelf**

**10-Module shelf P/N: 030-831-20**

<table>
<thead>
<tr>
<th><strong>Dimensions:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>mm:</td>
</tr>
<tr>
<td>inches:</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
</tr>
</tbody>
</table>

**Agency Compliance**

<table>
<thead>
<tr>
<th><strong>Safety:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA/UL 60950-1</td>
</tr>
<tr>
<td>CSA/UL 60950-21 (RFT-V circuit compatible)</td>
</tr>
<tr>
<td><strong>EMI:</strong></td>
</tr>
<tr>
<td>Class A radiated</td>
</tr>
<tr>
<td><strong>NEBS:</strong></td>
</tr>
<tr>
<td>GR-1089-CORE</td>
</tr>
<tr>
<td>GR-63-CORE</td>
</tr>
<tr>
<td>GR-3108-CORE</td>
</tr>
</tbody>
</table>
## ±190Vdc to -48Vdc Compact Converter

- ±190V to 48V DC-DC Down Converter for remote/line powering applications (RFT-V)
- Utilize existing copper pair networks for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote site
- Provide at least four (4) seconds of backup power to ensure load equipment can ride through brief converter resets

### P/N: 013-034-20

### Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (Input)</td>
<td>200 to 390Vdc (±100 to ±195Vdc)</td>
</tr>
<tr>
<td>Current (Input)</td>
<td>0.25A (dc) maximum per input</td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt;85% @ 10% load</td>
</tr>
<tr>
<td>Output Power</td>
<td>250W nominal</td>
</tr>
<tr>
<td></td>
<td>375W maximum (derates linearly with input voltage)</td>
</tr>
<tr>
<td>Voltage (Output)</td>
<td>-50 to -55Vdc with inputs operational</td>
</tr>
<tr>
<td>Current (Output)</td>
<td>7.5A @ 50V (derates linearly with input voltage)</td>
</tr>
<tr>
<td></td>
<td>7.8A @ 45V</td>
</tr>
<tr>
<td>Noise</td>
<td>&lt;100mVRMS to 20MHz (wide band)</td>
</tr>
<tr>
<td></td>
<td>&lt;500mVp-p to 20MHz</td>
</tr>
<tr>
<td>Acoustic noise</td>
<td>&lt;45 dBA at 1m (3ft)</td>
</tr>
<tr>
<td>Backed up output voltage</td>
<td>-46Vdc ±3%</td>
</tr>
<tr>
<td>Duration backup</td>
<td>350W for &gt;3.2 seconds @ -40°C (-40°F)</td>
</tr>
<tr>
<td></td>
<td>350W for &gt;6.4 seconds @ 25°C (77°F)</td>
</tr>
<tr>
<td></td>
<td>30 seconds maximum duration at low load</td>
</tr>
</tbody>
</table>

### Mechanical

- **Dimensions:**
  - mm: 86H x 223x 239D, w/ fastener
  - 86H x 223x 264D, w/ handle
  - inches: 3.4H x 8.8W x 9.4D, w/ fastener
  - 3.4H x 8.8W x 10.4D, w/ handle
- **Weight:** 2.84kg (6.26lbs)
- **Mounting:** Slides and fastens into Lucent Stinger® DSLAM cabinet

### Environmental

- **Temperature:**
  - Natural convection: -40 to 40°C (-40 to 104°F)
  - with 200 LFM airflow: -40 to 60°C (-40 to 140°F)
- **Humidity:** 0 to 95% RH non-condensing

### Agency Compliance

- **Safety:** CSA/EN/IEC/UL 60950-1
  - CSA/UL/IEC 60950-21 (RFT-V)
- **EMC:** ICES-003
- **FCC:** 47 CFR Part 15 Class B
- **NEBS:** Telcordia GR-1089-CORE
- **Telcordia:** GR-909-CORE
  - GR-950-CORE
  - GR-57-CORE
  - SR-332
  - TA-NWT-001500

---

### Performance / Features

- **Converter Status LED:**
  - Green – Outputs OK and inputs OK
  - Yellow – Outputs OK and one or more inputs NOT OK
  - Red or Off – Output NOT OK
- **Test points:**
  - Converter output voltage
- **Status LED:**
  - Green – charged
  - Green, flashing – charging
  - Red – failed
±190Vdc to 12Vdc or 48Vdc Line Power Remote Supply Unit

- ±190V to 12V or 48V DC-DC Downconverter for remote/line powering single family, multi-dwelling unit home (FTTH), premises (FTTP) or muni WiFi networks
- Utilize existing copper pair networks for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote sites
- Compact, self-enclosed design ideal for mounting on the side of house, or aerial strands
- Built-in power holdup ensures remote equipment rides through line surges

**LPR12-30, LPR12-60**
**LPR48-30, LPR48-60**

<table>
<thead>
<tr>
<th>Model</th>
<th>P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPR12-30</td>
<td>0120040-001</td>
<td>±190Vdc to 12Vdc Downconverter</td>
</tr>
<tr>
<td>LPR12-60</td>
<td>0120041-001</td>
<td>±190Vdc to 12Vdc Downconverter</td>
</tr>
<tr>
<td>LPR48-30</td>
<td>0120042-001</td>
<td>±190Vdc to 48Vdc Downconverter</td>
</tr>
<tr>
<td>LPR48-60</td>
<td>0120043-001</td>
<td>±190Vdc to 48Vdc Downconverter</td>
</tr>
</tbody>
</table>

**Electrical**

- **Input voltage:** ±100 to ±190Vdc
- **Output voltage:**
  - LPR 12-30: 12.0 - 12.5Vdc
  - LPR 12-60: 12 - 14Vdc
  - LPR 48-30: 47 - 50Vdc
  - LPR 48-60: 54 - 56Vdc
- **Power:** 30W (LPR 12-30/48-30)
  - 60W (LPR 12-60/48-60)
- **Efficiency:** >86% (12V) - 89% (48V)

**Performance / Features**

- **LED:** Presence of network line power providing output voltage
- **Connections:** 8 pin molex connectors
- **Wall Mounting:** Three #8 x 1½\" pan head screws with RTV sealing compound
- **Mechanical**
  - **Dimensions:** 202H x 138W x 52D
  - **Weight:** 0.78kg (1.7lbs)
- **Environmental**
  - **Temperature:** -40 to 65°C (-40 to 149°F)
  - **Humidity:** 5 to 95% RH non-condensing
- **Agency Compliance**
  - **Enclosure:** NEMA 3R
  - **Safety:** UL 60950-1
    - CSA/UL 60950-21 (RFT-V circuit compatible)
    - CSA/UL 60950-22
    - UL50E
  - **Emissions:** CFR47 (FCC) Part 15 Class A
    - EN 300 386 V1.6.1
ALPHACAP 665

Short Duration Backup Power Module

- Provide 3 to 10 seconds of backup power (holdup) of 48Vdc to remote loads such as xDSL and FT Tx equipment to ensure maximum reliability
- Supply up to 750W, of continuous power output
- Ensure load equipment can ride through brief converter resets
- Reduce truck rolls and operating expenses with no batteries at remote site

P/N: 013-015-20

**Electrical**

- **Input:**
  - Voltage: -48 to -56Vdc
  - Current (charge): 160 mA ±10% max
- **Backed up output voltage:** -46Vdc ±3%
- **Power:** 665W nominal, 750W maximum
- **Duration backup:**
  - 4.5 seconds, 665W @ 5 to 55°C
  - 3 seconds minimum, 665W @ -40 to 65°C
  - 30 seconds maximum duration at low load
  - 3.8 seconds, 750W load

**Mechanical**

- **Dimensions:**
  - mm: 43H x 183W x 350D
  - inches: 1.7H x 7.2W x 13.8D
- **Mounting:** L-shaped brackets for wall mounting

**Environmental**

- **Temperature:**
  - Nominal: 5 to 55°C (41 to 131°F)
  - Extended: -40 to 65°C (-40 to 149°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- **Humidity:** 0 to 95% RH non-condensing

**Agency Compliance**

- **Safety:** UL 60950-1, CSA C22.2 No. 60950
- **FCC:** 47 CFR Part 15 Class A
- **Telcordia:** GR-1089-CORE (where applicable)
100VA Class 2 Distribution System

- Modular line powering system designed for remotely powering iDAS and WiFi network equipment
- Meets NEC class 2 and communication circuit requirements for limited power circuits
- Dramatically reduces CAPEX costs and simplifies installation of network equipment requiring remote powering
- Built in DC-DC converter eliminates the need for externally mounted converter devices, significantly reducing network planning and engineering costs
- Industry leading power density enabling up to 36 channels in a compact 2RU footprint
- Cordex controller provides advanced remote web based monitoring and control features

P/N: 0300156-001

Electrical

Input voltage: ................. -40 to -60Vdc
Output voltage: ............... -57Vdc
Power: ......................... 98W nominal per output
               ......................... ±2W tolerance
               ......................... (4 outputs per module)
Efficiency: ...................... >92%
Regulation: ...................... <2% no load to full load
               ......................... <1% line
Noise:
               Wide band: ............... <50mV RMS (10kHz to 10MHz)
               ......................... <100mV pk to pk (10kHz to 100MHz)
Acoustic: ....................... <60dBA @ 1m (3ft), 55°C

Mechanical

- Quad Output Power Module
Dimensions:
               mm: ......................... 386H x 35W x 283D
               inches: ...................... 3.4H x 1.4W x 11.1D
Weight: ....................... 0.61kg (1.4lbs)

Shelves

- 19" shelf - 9 modules
Dimensions:
               mm: ......................... 88H x 435W x 432D
               inches: ...................... 3.5H x 17.1W x 17D
Weight: ....................... 5.45kg (12lbs)
Connections:
               Input: ......................... HOT: 2x sets, ¼" holes on ⅝ centers
               ......................... RTN: 2x sets, ¼" holes on ¾ centers
               Output: ...................... 9x 8 posn. Screw door TB (12-26AWG)

Environmental

Temperature:
- Operation with forced air cooling: -40 to 65°C (-40 to 149°F) with minimum cabinet air flow @ 200LFM
- Operation with convection cooling: -40 to 45°C (-40 to 122°F) single shelf operation only or separated by 1RU baffle

Storage: ...................... -40 to 85°C (-40 to 185°F)
Humidity: ...................... 0 to 95% RH non-condensing
Elevation: ...................... -500 to 2800m (-1640 to 9186ft)
Heat dissipation: ............. <118 BTU per hour/module

Performance/Features

Communication ports:
- CAN: ......................... Smart Peripherals
- Ethernet: ................. 10/100 Base-T for TCIP/SNMP features
Alarm relays: ................ Form C major
               ......................... Form C minor
               ......................... Form C fan tray alarm
Tri Color LED:
               System ok (green)
               Minor alarm (yellow)
               Major alarm (red)

Agency Compliance

Safety: ......................... CSA/UL 60950-1
EMC: ......................... ETSI 300 386
Emissions: ...................... CFR47 (FCC) Part 15 Class A
Immunity: ...................... EN 61000-4-2, EN 61000-4-3
               ......................... EN 61000-4-4, EN 61000-4-5
               ......................... EN 61000-4-6
NEBS/Telcordia: .............. GR-1089-CORE, GR-63-CORE

Related Components

eLimiter+ module: ............. 0120028-001
eLimiter+ shelf: .............. 0300156-001
CXCi+ controller: ............. 7400232-001
Fan tray: ....................... 0300055-002
Fan tray replacement: ...... 0300055-004
Air baffle: ..................... 0300055-003
Blank, 2 module: ............ 0380070-001
AGGREGATOR

Class 2 Circuit Aggregation Device

- Aggregates up to eight (8) NEC Class 2 inputs into a single, 48Vdc bulk output
- When deployed in conjunction with Alpha’s eLimiter™ product family, meets the requirements for Class 2 circuits, even for remote devices that consume more than 100W of power
- Enables remote powering of iDAS, indoor small cells and WiFi networks
- Dramatically reduces CAPEX by eliminating the need for conduit and certified electrical technicians
- Results in lower OPEX by eliminating the requirements for batteries at the remote sites

P/N: 0120046-001

Electrical

Input voltage: 48Vdc Nominal Range: 35 to 60Vdc (x 8 Class 2 Inputs)
Output voltage: 48Vdc Nominal
Output power: ≤800W
Efficiency: >98.5%
Voltage drop Input/Output: ≤200mV/A nominal

Insertion Line Loss per channel:
- 2 channels active: 1.8W / channel
- 4 channels active: 1.6W / channel
- 8 channels active: 1.5W / channel

Connections:
- Input: 8X 2 pos. plug-in TB, AWG #12-30
- Output: 2 pos. plug-in TB, AWG #10-30
- Alarm: 3 pos. plug-in TB, AWG #16-28
- Chassis Ground: Accept ¼” - ⅝” center to center, dual hole terminal lug, maximum width 0.7” (18mm)

Mechanical

Dimensions:
- mm: 43.6H x 275W x 224.8D
- inches: 1.72H x 10.83W x 8.85D
Weight: 2.7kg (6lbs)

Environmental

Temperature:
- Forced air cooling: -40 to 65°C (-40 to 149°F) with minimum cabinet air flow @ 200LFM
- Convection cooling: -40 to 45°C (-40 to 122°F) single shelf operation only or separated by 1TRU spacing

Storage: -40 to 65°C (-40 to 185°F)
Humidity: 0 to 95% RH non-condensing
Elevation: -500 to 2800m (-1640 to 9186ft)
Heat dissipation: <37.5 BTU per hour

Agency Compliance

Safety: CSA/UL 60950-1
EMC: ETSI 300 386
Emissions: CFR47 (FCC) Part 15 Class A
Immunity:
- EN 61000-4-2
- EN 61000-4-3
- EN 61000-4-4
- EN 61000-4-5
- EN 61000-4-6
NEBS/Telcordia:
- GR-1089-CORE
- GR-63-CORE

NEC:
Input circuits need to be compliant to NEC article 725 (CEC article 16-200) requirements for class 2 power limited circuits and need to be supplied from the eLimiter™ product family

Isolation:
2250Vdc electrical isolation between output and earth/chassis (compliant with IEEE 802.3 at standard to meet PoE+ isolation requirement)

Related Products

Ordering Information
- eLimiter+ module: 0120028-001
- eLimiter+ shelf: 0300156-001
- CXCi+ controller: 7400232-001
- Fan tray: 0300055-002
- Fan tray replacement: 0300055-004
- Air baffle: 0300055-003
- Blank, 2 module: 0380070-001
Inverter Solutions

Alpha offers the latest technology in modular power systems to support small to mid-sized critical AC loads in a variety of standard and custom configurations.

Alpha’s Modular Power System 80 HP (AMPS80 HP) and 24 HP (AMPS24 HP) offer Telecom-grade AC power for critical loads in Central Offices, Switching Centers, Cable Head-Ends and Data Centers. These systems offer exceptional reliability, up to 94% power efficiency and optimal power density through a scalable, modular platform with integrated, intelligent system control.

AMPS80 HP and AMPS24 HP are offered in 3-phase, 2-phase and single-phase UPS or Inverter configurations and may be configured to provide N+1 redundancy per phase. A smart unified controller with integrated SNMP interface monitors and manages both inverter and rectifier modules through a web based GUI and local LCD touch screen.

For smaller applications, the INEX inverter is a fully integrated single phase system specifically designed to backup critical AC loads. With proven Alpha reliability and flexibility, the system may be configured to provide N+1 redundancy. An optional static transfer switch allows automatic transfer of power in less than a quarter of a cycle. A user friendly interface displays real time information, making the system easy to configure and manage.
AMPS TOPOLOGY

AMPS HP is a revolutionary high performance technology that combines the high reliability of a telecom-grade inverter system with a highly efficient UPS.

AMPS is a new tool in the delivery of battery backed AC power. It enables telcos to supply highly reliable video and data delivery as part of triple play service. It offers data centers a more reliable means of powering mission-critical servers and routers. And the same system delivers either single or 3-phase AC power.

The core of the AMPS system is the Alpha Inverter Module (AIM). Unlike a conventional inverter that transforms a DC input into an AC output, or a traditional UPS that delivers an AC output from an AC input, the AIM accepts both AC and DC inputs. This innovative approach is the key reason the AMPS system is more reliable than a UPS, more efficient than an inverter.

Advantage AMPS

The technology behind the AMPS system offers tremendous benefits to the user.

1. **AMPS delivers fully conditioned, line-regulated telecom-grade AC power with up to 94% system efficiency.**

2. **In the event of an AC outage, there is zero transfer time with AMPS.** While the same can be said of an online inverter or double conversion UPS, that is not the case with a line interactive UPS.

3. **AMPS is more reliable than devices that rely on a static transfer switch (STS) for protection.** In both AC UPS and Telecom grade inverter system topologies, the STS becomes the “single point of failure”, because if it fails to bypass DC when there is a battery failure, critical loads might get dropped. With AMPS, commercial AC is normally responsible for powering the load, and the 400Vdc bus is always present, so there is no need for an STS.

4. **AMPS can include N+1 redundancy.** The modularity of the system lends itself to redundant operation. AMPS systems can also be configured for N+N redundancy within a single rack system yielding significant floor space savings for revenue generating equipment.

5. **AMPS is scalable.** Even with traditional modular inverter and UPS systems, a STS must be sized at the time of installation thus limiting future expansion. AMPS can grow with the addition of AIM modules and/or modular rectifiers.

6. **AMPS is safe for technicians.** With AMPS, technicians are only exposed to 120Vac and 48Vdc, both prevalent and conventional voltages. On the other hand, UPS systems using elevated voltages to achieve higher system efficiencies expose technicians to unsafe voltages, and even though the AIM modules do produce a 400Vdc bus, that voltage is internal to the inverter module and not accessible by the technician.

7. **AMPS uses conventional 48Vdc power and batteries.** By using 48Vdc, AMPS avoids the expense of high voltage batteries and the expensive service contracts needed to maintain them. And indoor 48Vdc batteries often have a 10 to 20 year design life.
8. **AMPS only requires enough rectifiers to charge the batteries used during an AC outage.** Unlike conventional Inverters, AMPS only requires incoming DC to provide the AC output when the utility AC is out of service. So rather than sizing the rectifiers as if the inverter is another DC load, the rectifiers can be sized only for the amount of time prescribed for recharging the batteries.

9. **AMPS can be configured for either single phase two dole/split phase or 3-phase AC output power.**

10. **AMPS is designed to handle dynamic load surges.** AIM modules can operate continuously at 110% of rated output, as well as provide short term overload compatibility of up to 150% capacity for 5 seconds.

---

### AIM Internal Power Architecture

#### How does it work

1. Each AIM accepts an input from an AC source, typically via AC mains (i.e., commercial utility AC) or an AC generator. It rectifies this 120Vac input into a 400Vdc output for delivery to a common bus. The high output DC voltage enables the unit to achieve a very high efficiency.

2. Each AIM unit also accepts a DC input, either from external battery plants or other energy storage and generation devices such as fuel cells and DC generators. The 48Vdc input is converted to a 400Vdc output for delivery to the common bus. Again, because of the high voltage DC output, the efficiency of the system is very high.

3. An onboard Digital Signal Processor actively monitors both module inputs and controls which one (or how much of each one) is to be delivered to the 400Vdc bus. The selection process is based on the following:
   - If commercial AC is available, the DSP selects the rectified 400Vdc
   - If commercial AC is unavailable, the DSP selects the converted 400Vdc
   - If commercial AC is partially unavailable, as in the case of a brown-out condition, the DSP augments the rectified output with converted output power.
   - DC or AC input priority may also be manually configured, as well as automatically triggered remotely to accommodate advanced energy management such as utility peak shaving.

4. The 400Vdc bus is then inverted into 120Vac to power the equipment.

---

### The advantages of AMPS compared to an AC UPS and Inverter are shown in the table below:

<table>
<thead>
<tr>
<th>Features</th>
<th>Inverter</th>
<th>UPS</th>
<th>AMPS HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtered AC output</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>High efficiency design</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Utilize low voltage, telecom batteries</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Eliminates need for STS</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Additional rectification ONLY for charging</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Modularity / Scalability</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Centralized AC &amp; DC control and monitoring</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
<tr>
<td>Compatibility with existing DC plants</td>
<td>⚫</td>
<td>⚫</td>
<td>⚫</td>
</tr>
</tbody>
</table>

* = Fully compliant   ● = Partially or sometimes compliant   ○ = Not compliant
AMPS80 HP
Modular AC Power System

- Innovative, modular inverter system for critical facilities and Telecom applications
- Single, dual and three phase configurations with up to 75kVA/60kW capacity
- 94% efficiency and ‘HP’ technology engineered to deliver high system reliability and low total cost of ownership
- Optional 2.0kW rectifier modules convert the AMPS80 into a modular, standalone, high reliability UPS
- Hot swappable 2.5kVA/2.0kW inverter modules provide flexibility, scalability and redundancy
- Intelligent system controller with integrated SNMP for local and remote management of all system elements
- Small footprint system offers up to 75kVA/60kW in a single 19" box bay rack, freeing up valuable rack and floor space

Consult your Alpha representative for P/N configurations

Performance / Features

- System controller with integrated SNMP communications
- Top AC and DC feed access; bottom DC feed access
  (All user connections are front accessible)
- AC input and output breaker/disconnect switch
- Industrial grade surge suppression (rated to 40kA)

Mechanical

Dimensions:
mm:.................................2134H x 600W x 680D
inches:............................84H x 23.6W x 26.75D
System weight (without modules):........270kg (595lbs)

Module dimensions:
mm:..................................88.9H x 102W x 435D
inches:............................3.5H x 4W x 17.13D
Module weight:....................5kg (11lbs)

Clearance:
Front:...............................100cm (33in)
Rear:.................................30cm (12in) minimum
Sides:...............................900mm (36in) to the left of the system
Top:.................................30cm (12in)

Environmental

Temperature:
- Operating (full load):......-20 to 40°C (-4 to 104°F)
- Storage:..........................-40 to 70°C (-40 to 158°F)

Relative humidity:........Up to 95%, non-condensing

Operating altitude:.......Up to 1500m (4921ft) above sea level

Options

- Up to 8 x 2.0kW rectifier modules (UPS configurations)
- Internal maintenance bypass switch
- Inverter DC input breakers
- Service-entrance grade surge suppression:140kA rating, per phase
- Lockable rack front-door
- Batteries (various sizes and technologies)

Agency Compliance

Safety:............................UL1778 (2nd Ed); CSA C22.2 No. 107.3-05 UPS General Safety
EMC:...............................FCC CFR47 Part 15 Class A; ICES-003
## Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AMPS80-3-75</th>
<th>AMPS80-3-30</th>
<th>AMPS80-2-40</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P/N</strong></td>
<td>Consult your Alpha representative for P/N configurations</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input &amp; output phase</strong></td>
<td>120/208V 3-ph</td>
<td>120/208V 3-ph</td>
<td>120/240V or 120/208V 2-ph</td>
</tr>
<tr>
<td><strong>Output capacity</strong></td>
<td>7,500 to 75,000VA</td>
<td>7,500 to 30,000VA</td>
<td>5,000 to 40,000VA</td>
</tr>
<tr>
<td><strong>Output power (resistive load)</strong></td>
<td>6,000 to 60,000W</td>
<td>6,000 to 24,000W</td>
<td>4,000 to 32,000W</td>
</tr>
<tr>
<td><strong>Maximum output current</strong></td>
<td>208A rms per phase</td>
<td>83A rms per phase</td>
<td>168A rms per phase</td>
</tr>
<tr>
<td><strong>Max. no. of 2,500VA/2,000W inverter modules</strong></td>
<td>30</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td><strong>Min. no. of 2,500VA/2,000W inverter modules</strong></td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>Proprietary HP technology. Each inverter module has DC input and AC input</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Static switch</strong></td>
<td>Not required; each module has built-in DSP controlled static switch functionality</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Efficiency</strong></td>
<td>94% AC-to-AC; 90% DC-to-AC (from 50 to 100% full resistive load)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waveform</strong></td>
<td>Pure sine wave</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output power factor</strong></td>
<td>0.8 (can run capacitive &amp; inductive loads)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transfer time</strong></td>
<td>Zero transfer time</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>2 year standard (1 and 3 year optional extensions)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Inverter Module AC Output

| **Power rating** | 2,500VA/2,000W |
| **Voltage range (AC)** | 90 – 140V |
| **Voltage accuracy** | ±2% |
| **Frequency** | 60Hz (same as input frequency) |
| **Inverter frequency accuracy** | 0.03% |
| **Input power factor** | >99% |
| **THD (resistive load)** | <1.5% |
| **Transmit load recovery time** | 0.4ms |
| **Soft start time** | 20s |
| **Maximum crest factor at nominal power** | 3.5 |
| **Short circuit overload capacity** | 10 x I<sub>n</sub> for 20msec (AC-to-AC mode) |
| **Short term overload capacity** | 150% for 5 seconds |
| **Permanent overload capacity** | 110% |
| **Synchronization range** | 57 – 63Hz |

### Inverter Module DC Input

| **Nominal voltage** | 48Vdc |
| **Voltage range (max)** | 40 – 60Vdc (User Adjustable) |

### Max. DC Input Current

| **@48Vdc** | 1375A | 550A | 734A |
| **@40Vdc** | 1700A | 680A | 900A |
| **Voltage ripple** | <2mW/38 dBm |

### System Controller with Integrated SNMP

| **Control & monitoring** | Configure, control and monitor inverter and rectifier modules via a web browser |
| **Display** | LCD touch-screen display (160 x 160 pixels) OK/Major/Minor 3-Color LED Web based GUI via ethernet |
| **Communication ports** | RJ45 ethernet port RS232 Port (Front) |
AMPS24 HP

Modular AC Power System

- Innovative, modular inverter system for critical facilities and Telecom applications
- Single, dual and three phase configurations with up to 24kVA/19.2kW capacity
- 93% efficiency and "HP" technology engineered to deliver high system reliability and low total cost of ownership
- Optional 1.8kW rectifier modules convert the AMPS24 into a modular, standalone, high reliability UPS
- Hot swappable 1.5kVA/1.2kW inverter modules provide flexibility, scalability and redundancy
- Intelligent controller with integrated touchscreen display provides local and remote management of all system elements
- High power density yields space for revenue generating equipment

Performance / Features

- **3i + 1R system:** Up to 3 x 1500VA/1200W inverter modules and 1 x 1800W rectifier module per shelf (1150W for single phase)
- **4i system:** Up to 4 x 1500VA/1200W inverter modules per shelf
- System controller with integrated SNMP communications
- 5.7” VGA (640 x 480) color touch screen LCD panel
- Removable covers for ease of installation
- Industrial grade surge suppression
- Inverter AC input and AC output breakers
- Inverter DC breakers (1 breaker per shelf)
- Internal make-before-break rotary maintenance bypass switch

System Controller with integrated SNMP

**Control and Monitoring:**
Configure, control and monitor inverter and rectifier modules remotely via a web browser

**Display:**
- 5.7” VGA (640 x 480) color touch screen LCD display
- OK/Major/Minor 3-Color LED display
- Web based GUI via Ethernet

**Communication Ports:** RJ45 Ethernet Port

**Controller I/Os:**
- Voltage inputs:............ 1
- Temperature inputs: ....... 2
- Current inputs:............ 1
- Digital inputs:............. 6
- Relay outputs:............. 6

Mechanical

**System dimensions:**
- mm: 622H x 443W x 432D
- inches: 24.5H x 17.44W x 17D
- Weight (w/o modules): 52.16kg (115lbs)

**Module dimensions**
- mm: 88.9H x 102W x 300D (inverter)/235D (rectifier)
- inches: 3.5H x 4W x 12.5D (inverter)/9.25D (rectifier)
- Weight: 2.4kg (5.3lbs) inverter/2.8kg (6.2lb) rectifier

Environmental

**Temperature**
- Operating (full load): -20 to 50°C (-4 to 122°F)
- Storage: -40 to +70°C (-40 to 158°F)
- Relative Humidity: Up to 95%, non-condensing
- Operating Altitude: Up to 1500m (4,900ft) above sea level

**Options**
- Up to 4x 1.8kW rectifier modules (UPS configurations)
- Open relay racks and box bay racks for mounting
- Front terminal UPS or Telecom batteries
- *Height and weight for 4-shelf system; other models vary in height and weight
- **Mounting ears for 19" or 23" racks

Agency Compliance

**Safety:** UL1778 (2nd Ed); CSA C22.2 No. 107.3-05 UPS General Safety
**EMC:** FCC CFR47 Part 15 Class A; ICES-003
### AMPS24 HP Systems - General Specifications

<table>
<thead>
<tr>
<th>Technology</th>
<th>Proprietary HP technology: Each inverter has DC and AC input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static switch</td>
<td>Not required; each module has built-in DSP controlled static switch functionality</td>
</tr>
<tr>
<td>Efficiency</td>
<td>93% AC-to-AC; 90% DC-to-AC (from 50 to 100% full resistive load)</td>
</tr>
<tr>
<td>Waveform</td>
<td>Pure sine wave</td>
</tr>
<tr>
<td>Output power factor</td>
<td>0.8 (can run capacitive &amp; inductive loads)</td>
</tr>
<tr>
<td>Transfer time</td>
<td>Zero transfer time</td>
</tr>
</tbody>
</table>

### AMPS24 HP Systems using 3i+1R Shelves (UPS)

<table>
<thead>
<tr>
<th>Model*</th>
<th>AMPS24-3-13.5-H3</th>
<th>AMPS24-2-18-H4</th>
<th>AMPS24-2-9-H2</th>
<th>AMPS24-1-9-H2</th>
<th>AMPS24-1-4.5-H1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input &amp; output phase</td>
<td>120/208V 3-ph</td>
<td>120/240V or 120/208V 2-ph</td>
<td>120V single ph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal output power (max)</td>
<td>4500 to 13500VA</td>
<td>3000 to 18000VA</td>
<td>3000 to 9000VA</td>
<td>1500 to 9000VA</td>
<td>1500 to 4500VA</td>
</tr>
<tr>
<td>Output power (resistive load)</td>
<td>3600 to 10800W</td>
<td>2400 to 14400W</td>
<td>2400 to 7200W</td>
<td>1200 to 7200W</td>
<td>1200 to 3600W</td>
</tr>
<tr>
<td>Maximum output current</td>
<td>37.5A rms per phase</td>
<td>75A rms per phase</td>
<td>37.5A rms per phase</td>
<td>75A rms per phase</td>
<td>37.5A rms</td>
</tr>
<tr>
<td>Max. no. of 1500VA/1200W inverter modules per system</td>
<td>9</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Min. no. of 1500VA/1200W inverter modules per system</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Max. no. of 1800W rectifier modules per system</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

### AMPS24 HP Systems using 4i Shelves (Inverter)

<table>
<thead>
<tr>
<th>Model**</th>
<th>AMPS24-3-18-3i</th>
<th>AMPS24-2-24-4i</th>
<th>AMPS24-2-12-2i</th>
<th>AMPS24-1-12-2i</th>
<th>AMPS24-1-6-1i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input &amp; output phase</td>
<td>120/208V 3-ph</td>
<td>120/240V or 120/208V 2-ph</td>
<td>120V single ph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal output power (max)</td>
<td>4500 to 18000VA</td>
<td>3000 to 24000VA</td>
<td>3000 to 12000VA</td>
<td>1500 to 12000VA</td>
<td>1500 to 6000VA</td>
</tr>
<tr>
<td>Output power (resistive load)</td>
<td>3600 to 14400W</td>
<td>2400 to 19200W</td>
<td>2400 to 9600W</td>
<td>3600 to 9600W</td>
<td>2400 to 4800W</td>
</tr>
<tr>
<td>Maximum output current</td>
<td>50A rms per phase</td>
<td>100A rms per phase</td>
<td>50A rms per phase</td>
<td>100A rms per phase</td>
<td>50A rms per phase</td>
</tr>
<tr>
<td>Max. no. of 1500VA/1200W inverter modules per system</td>
<td>12</td>
<td>16</td>
<td>8</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Min. no. of 1500VA/1200W inverter modules per system</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*Model Descriptor: AMPS24 - [Phase] - [Maximum kVA] - [Number of 3i + 1R Shelves]*

**Model Descriptor: AMPS24 - [Phase] - [Maximum kVA] - [Number of 4i Shelves]*
Versatile modular design provides flexibility for different power 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

The INEX inverter series is an integrated telecommunications power system, including inverter, static switch, LCD display controller and interface modules. With a versatile “building block” design and N+1 redundant configuration, the INEX inverter system facilitates complex telecommunications and industrial power demands, and provides ultimate flexibility for your current and future power requirements.

N+1 parallel redundancy allows power capacity expandable up to 24kVA. INEX “all master” dynamic mechanism automatically shares and re-organizes critical loads to prevent interruption should any inverter module fail. The DSP-microprocessing controller gives real-time system status through a comprehensive LCD display, and allows programmable settings through the display panel.
With a communication interface module installed, you can further control and monitor the system remotely.
Consult your Alpha representative for P/N configurations

**Electrical**

### Inverter Module

**DC input:**
- Nominal voltage: 48Vdc
- Operating range: 40.5Vdc ~ 58Vdc
- Input protection: Reverse polarity protection
- Psophometric noise voltage: ≤1.0mV ITU-T O.41 (16.66~6000Hz)

**AC output:**
- Power rating: 1500VA/1200W or 1000VA/800W
- Waveform: Pure sine wave
- Power factor: 0.8
- Nominal output voltage: 110/115/120Vac, 208/220/230/240Vac
- Voltage variation: ±2%
- Output frequency: 50/60Hz
- Crest factor: 3:1
- THD: <3%, linear load
- Efficiency: Min 88%
- Isolation AC-enclosure: Basic isolation (Pri-Gnd) 2121Vdc/1min
- Dynamic response: <a/10%
- Over load protection: 1.5 x I_{nom} >20s
  1.25 x I_{nom} temperature controlled

### STS Module

**Input:**
- Over voltage threshold:
  - Adjustable between 127 to 138Vac for 120Vac systems, the default value is 132Vac
  - 233 to 252Vac for 220Vac systems, the default value is 242Vac

- Under voltage threshold:
  - Adjustable between 100 to 114Vac for 120Vac systems, the default value is 108Vac
  - 176 to 209Vac for 220Vac systems, the default value is 198Vac

- Backfeed protection: Comply with safety requirement
- Redundant power: Startup power-on by priority
- Design: Source or alternative

**Output:**
- Nominal output voltage: Same as utility or the output of inverter modules
- Permissible frequency area: Max 2.5%
  (inverter synchronization)
- Transfer time: Typical ¼ cycle
- Rated current: 50A or 100A options
- Operation methods: Inverter priority/mains priority

### Environmental

**Temperature:**
- Operating: 20 to 70°C (-4 to 158°F)
- Storage: -5 to 58°C (23 to 122°F) with full performance
- Humidity: 40 to 85°C (-40 to 185°F)
- Audible noise: 90% RH non-condensing

**Humidity:**
- Operating: 90% RH non-condensing

**Audible noise:**
- ≤55dB

### System parameter:

- Baud rate: Setting controller com port baud rate
- Keypad tones: Setting keypad tones
- Time & date: Setting current time and date
- Setting password: Setting system password
- Brightness: Setting LCD brightness
- Default: Change current system parameters to default value

### Mechanical

#### Inverter Module

**Dimension:**
- 50A: 270D x 215W x 43.8H
- 100A: 265D x 215W x 84H
- Weight: 2.0kg (4.4lbs)
- Weight: 3.0kg (6.61lbs)

#### STS Module

**Dimension:**
- 50A: 270D x 215W x 43.8H
- 100A: 265D x 215W x 84H
- Weight: 2.0kg (4.4lbs)
- Weight: 3.0kg (6.61lbs)

#### Controller Module

**Dimensions:**
- 277D x 87.9W x 43.5H
- Weight: 1.0kg (2.2lbs)

#### Hot-swap Chassis

**19/23” mounting brackets**

**Inverter chassis dimension:**
- 329.5D x 440W x 44H
- Weight: 2.5kg (5.5lbs)

**STS & controller chassis dimension:**
- 329.5D x 440W x 44H
- Weight: 3.4kg (7.5lbs)

### Communication Interface

- RS-232x2: Communicate with PC
- RS-485x2: Communicate with supervision
- Dry contactx5: Communicate with external monitor
- USBx1: Communicate with PC

### Agency Compliance

**Safety:** EN 60950-1, UL 60950-1, CSA C22.2 No. 60950-1
**EMC:** EN 55022:1998
**Certifications:** UL, CE
**RoHS:** Compliant
Revolutionary ‘GREEN’ technology provides 93% system efficiency
Up to 3kVA/2.4kW of highly reliable, Telecom-grade AC power
2RU shelf system provides high power density
Flexible mounting options for 19" or 23" box bay or open relay racks
Integration with Alpha’s CXC controllers via CAN bus

Consult your Alpha representative for P/N configurations

### Nominal Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>93% AC-to-AC; 90% DC-to-AC</td>
</tr>
<tr>
<td>(from 50 to 100% full resistive load)</td>
<td></td>
</tr>
<tr>
<td>Waveform</td>
<td>Pure sine wave</td>
</tr>
<tr>
<td>Output power factor</td>
<td>0.8 (can run capacitive &amp; inductive loads)</td>
</tr>
<tr>
<td>Transfer time</td>
<td>Zero transfer time</td>
</tr>
<tr>
<td>Module MTBF</td>
<td>&gt;200,000hrs</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
</tr>
</tbody>
</table>

### Inverter Module AC Output

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power rating</td>
<td>1500VA/1200W</td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>120Vac</td>
</tr>
<tr>
<td>Voltage accuracy</td>
<td>±2%</td>
</tr>
<tr>
<td>Frequency</td>
<td>60Hz (same as input frequency)</td>
</tr>
<tr>
<td>Inverter frequency accuracy</td>
<td>0.03%</td>
</tr>
<tr>
<td>THD (resistive load)</td>
<td>&lt;1.5%</td>
</tr>
<tr>
<td>Transient load recovery time</td>
<td>0.4 ms</td>
</tr>
<tr>
<td>Soft start time</td>
<td>20s</td>
</tr>
<tr>
<td>Maximum crest factor</td>
<td>3.5</td>
</tr>
<tr>
<td>(nominal power)</td>
<td></td>
</tr>
<tr>
<td>Short circuit overload capacity</td>
<td>10 x I n for 20msec (AC-to-AC mode)</td>
</tr>
<tr>
<td>Short term overload capacity</td>
<td>150% for 5 seconds</td>
</tr>
<tr>
<td>Permanent overload capacity</td>
<td>110%</td>
</tr>
<tr>
<td>Synchronization range</td>
<td>57 - 63Hz</td>
</tr>
<tr>
<td>Heat dissipation</td>
<td>286 BTU per hour in AC-to-AC mode</td>
</tr>
<tr>
<td></td>
<td>410 BTU per hour in DC-to-DC mode</td>
</tr>
</tbody>
</table>

### Monitoring and Control

- T2S Controller may be seamlessly integrated with Cordex CXC controller via CAN bus
- Dry contacts on shelf
- Status LEDs on modules

### Environmental

- Temperature:
  - Operating (full load): -20 to 50°C (-4 to 122°F)
  - Storage: -40 to +70°C (-40 to 158°F)
- Relative humidity: Up to 95%, non-condensing
- Operating altitude: Up to 1500m (4,900ft) above sea level

### Mechanical

- Dimensions:
  - mm: 89H x 448W x 317.5D
  - inches: 3.5H x 17.65W x 12.5D
- Weight: 12.7kg (28.2lbs) (including 2 x Media modules)

### Agency Compliance

- Safety: UL 1778 (Ed.4)
- EMC:
  - Immunity: IEC 1000-4
  - Emission: FCC PART 15
DC Power Solutions for Outdoor Applications

Telecom operators will deploy millions of Small Cells in the coming years to increase their network capacity and meet the exponential demand for mobile data and coverage in both dense urban centers and rural areas. By offloading data from the macro cell network, Small Cells improve overall network performance. One of the key benefits of Small Cells is the ability to pinpoint coverage near the users. But this means more sites, more backhaul and more power. These challenges are being addressed by the Small Cell market, with Alpha Technologies playing a leading role in determining the most effective and efficient means of powering these diverse devices.

Alpha developed an affordable, easy to install and maintain powering solution for Small Cell deployments. A sealed and rugged system, Cellect™ is an integrated Telecom grade DC power solution with built-in battery backup for outdoor applications. Its compact, lightweight design and plug-and-play connectors enable a single technician to install it in minutes, a requirement for the high volume expectations for the outdoor small cell market. Cellect addresses a wide variety of Small Cell applications, as it comes with a universal mounting bracket for mounting on poles, walls, or combination brackets. It also offers a wide input AC range over temperatures from -40 to 65°C (-40 to 149°F). The unit’s low acoustic noise makes it ideal for deployment in residential environments, and its primer finish can be easily painted to meet municipality or landlord requirements.
48Vdc Small Cell Power Supply with Inbuilt Battery

-48V/600W telecom grade outdoor power system, Class 4/IP65
- Integrated battery backup increases system availability and end-user Quality of Experience (QoE)
- Key features enable outdoor small cell deployments
  - Small physical size (16” x 9” x 6”) alleviates concerns about optical intrusion
  - Light weight (25lbs) design maximizes options for deployment on poles and walls
  - Easy to install by a single technician within minutes
- Reduced OPEX resulting from maintenance-free battery & enclosure, and high efficiency rectifier design
- Advanced monitoring and control, including SNMP, at both the system level and for individual circuits

**P/N: 0100021-001**

**P/N: 0100021-001**

**Electrical**

- **AC nominal input:** 100 to 277Vac
- **AC input frequency:** 45 to 65Hz
- **Output voltage:** -48 to -55Vdc
- **Output power:** 600W continuous
- **Efficiency:** >94.5%
- **Electrical noise:** <30mV RMS (to 10MHz), <150mV pk to pk (to 100MHz)
- **Acoustic noise:** <40dBa at 1m (3ft)
- **Power backup:** 3.2Ah

**Performance/Features**

- **Power backup runtime:** 15 min @ 450W load
- **Alarms:**
  - AC Fail
  - On Battery
  - Battery Low
  - Module Error
- **LED:** Green: DC Output OK
- **Remote monitoring:** Ethernet, SNMP

**Agency Compliance**

- **Safety:** IEC/CSA/UL 60950-1, ETSI 300 386-2, CE Mark
- **EMC:** CFR47 (FCC) Part 15 Class A, EN 55022 class A, EN 61000-3-2, 3-3
- **Immunity:** EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, -4-11, ANSI / IEEE C62.41 CatB3
- **NEBS:** GR-63-CORE, GR-1089-CORE

**Mechanical**

- **Dimensions:** 382H x 236W x 165D (195 w/bracket) inches: 15H x 9.3W x 6.5D (7.7 w/bracket)
- **Weight:** <11kg (24lbs)
- **Mounting:** Bracket for pole and wall mounting
- **Connections (IP65 cable glands):**
  - Six (6) DC Output
  - AC Input
  - Alarms
  - Ethernet

**Mechanical**

- **Dimensions:** 382H x 236W x 165D (195 w/bracket) inches: 15H x 9.3W x 6.5D (7.7 w/bracket)
- **Weight:** <11kg (24lbs)
- **Mounting:** Bracket for pole and wall mounting
- **Connections (IP65 cable glands):**
  - Six (6) DC Output
  - AC Input
  - Alarms
  - Ethernet

**Environmental**

- **Temperature:**
  - Operation: -40 to 46°C (-40 to 149°F) plus solar loading
  - Storage: -40 to 85°C (-40 to 185°F)
- **Environmental protection:** IP65
- **Humidity:** 5 to 100% RH
- **Elevation:** -500 to 2000m (-1640 to 6561ft)
Outdoor UPS Solutions

With 40 years of experience in the global UPS market, Alpha is the leader in providing a complete line of AC powering solutions for rugged outdoor applications. This includes hardened outdoor enclosures, uninterruptible power supply (UPS) modules, specialty batteries, accessories and generators that can be custom integrated to meet your application.

A truly outdoor UPS system has many distinguishing characteristics, including conformally coated printed circuit boards (PCBs) which protect against exposure to moisture and dust, and carefully selected components to operate reliably in extreme temperatures. In addition, Alpha’s products and solutions are designed to meet each customer’s unique power, runtime and installation requirements. Alpha’s UPS solutions also offer superior communication capabilities including remote monitoring via SNMP web-based communication. Real-time alerts and reports on UPS status can be sent to multiple email addresses, or can be monitored from a smartphone, laptop or notebook, each with selectable event severity levels to trigger different notifications of events, faults and alarms.
Uninterruptible Power Supply selection guide
To help us design an Uninterruptible Power Supply (UPS) solution for your specific application, please review the following questions prior to contacting your Alpha representative:

What is the type of application and what specific systems/devices will be backed up?
PBX, cell site, server, traffic, parking, security or other.

What are the environmental conditions?
- Indoor: Controlled environment, air conditioned, dust free
- Outdoor: Non-controlled environment: snow, rain, elevation, humidity, dust, etc.
- Minimum ambient temperature surrounding the UPS
- Maximum ambient temperature surrounding the UPS

Where will the UPS be located (country, city/town)?

What are the power requirements?
- Volt-amps (VA) or Watts required by load
- Input voltage to UPS and output voltage(s) to load(s)
- Frequency (Hz) 50 or 60
- Type of loads: Motor loads, inductive loads
- Advise inrush current if any

How much backup time is required?
- The amount of time in hours or minutes the UPS will operate on batteries when the utility power fails
- The expected frequency of utility power failures: eg., once/year, twice/month

How will the UPS be mounted?
- Indoor applications: rack, tower, wall
- Outdoor applications: pole, ground (is a pedestal required?), or wall

What are the input/output configuration requirements?
- Input plug type or terminal block
- Output receptacle type(s) or terminal block

Are any accessories required?
Bypass Switch (auto/manual), Ethernet/SNMP*, Battery Management System, Enclosures, Racks

What are your warranty/service needs?
Is extended warranty required? Periodic or special servicing needs? Installation/commissioning services?

What quantities are needed?
Number of units required and when

*Ethernet/SNMP communication is standard on some products
350W/VA UPS module designed to operate in extreme environments; providing maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances.

Unsurpassed flexibility with dual 120Vac and 24Vac outputs

Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag.

Local and remote monitoring and control via USB port and Ethernet SNMP interface

Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery

Independently programmable control and report dry contacts allow monitoring and controlling of key functions.

Consult your Alpha representative for P/N configurations

### Electrical

#### 120Vac Model
- **Battery string voltage:** 48Vdc or 24Vdc
- **Nominal voltage:** 120Vac
- **Frequency:** 60/50Hz ±5% (auto-detection)

**Input:**
- Voltage range (w/o transferring to battery mode): 88 to 152Vac
- Current: @ nominal voltage and max battery charging current
- FXM350-24: 5.3A
- FXM350-48: 5.7A

**Output:**
- Waveform: Pure sinewave
- Nominal voltage: Dual 120Vac, 24Vac
- Voltage regulation: ±10%
- Power at 50°C: 350W/VA Total
- Waveform: Pure sinewave

#### 230Vac Model
- **Battery string voltage:** 24Vdc
- **Nominal voltage:** 230Vac
- **Frequency:** 60/50Hz ±5% (auto-detection)

**Input:**
- Voltage range (w/o transferring to battery mode): 151 to 282Vac
- Current: 2.7A (@ nominal voltage and max battery charging current)

**Output:**
- Waveform: Pure sinewave
- Nominal voltage: 230Vac, 24Vac
- Voltage regulation: ±10%
- Power at 50°C: 350W/VA Total
- Waveform: Pure sinewave

### Mechanical
- **Mounting:** 19" or 23" rack with the addition of ears for rack mounting
- **Dimensions:**
  - mm: 88.14H x 341.88W x 211.74D
  - inches: 3.47H x 13.46W x 8.34D
- **Weight:** 8.62kg (19lbs)

### Environmental
- **Operating temp range:** -40 to 74°C (-40 to 165°F)
- **Audible noise @ 25°C:** <45dBa @ 1 meter (39in)

*Derates after 50°C

### Performance
- **Typical output voltage THD:** <3%
- **Typical efficiency:** >96% (resistive load)
- **Typical transfer time:** <5ms

### Power Connector Options

#### 120Vac Model

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Terminal Block</td>
<td>Terminal Block</td>
</tr>
</tbody>
</table>

#### 230Vac Model

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Terminal Block</td>
<td>Terminal Block</td>
</tr>
</tbody>
</table>

### Agency Compliance

**Electrical safety:** UL1778, CSA C22.2 No. 107.3; EN62040-1

**EMC:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

**CE applies to 230Vac version only**
FXM 650
Rugged UPS Module

> 650W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
> Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
> Independently programmable control and report dry contacts allow monitoring and controlling of key functions
> Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
> Local and remote monitoring and control via RS232 port and Ethernet SNMP interface*

Consult your Alpha representative for P/N configurations

### Electrical

**120Vac Model**

- **Battery string voltage:** 24Vdc or 48Vdc
- **Nominal voltage:** 120Vac
- **Nominal frequency:** Auto-sensing

**Input:**
- Current: 8.7A (@ nominal voltage and max battery charging current)
- Voltage: 85 to 175Vac

**Output:**
- Voltage regulation: ±10% over input voltage range
- Power at 55°C: 650W/VA

**230Vac Model**

- **Battery string voltage:** 24Vdc
- **Nominal voltage:** 230Vac
- **Nominal frequency:** Auto-sensing

**Input:**
- Current: 4.5A (@ nominal voltage and max battery charging current)
- Voltage range: 150 to 328Vac

**Output:**
- Voltage regulation: ±10% over input voltage range
- Power at 55°C: 650W/VA

### Mechanical

- **Dimensions:** 88H x 432W x 229D
- **Weight:** 11kg (25lbs)

### Environmental

**Operating temp range**: -40 to 74°C (-40 to 165°F)
**Audible noise @ 25°C**: 45dBa @ 1 meter (39in)

*Derates after 55°C

### Performance

**Typical output voltage THD:** <3%
**Typical efficiency:** >98% (resistive load)
**Typical transfer time:** <5ms

### Power Connector Options

120Vac Model

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Block</td>
<td>Terminal Block</td>
</tr>
</tbody>
</table>

230Vac Model

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Block</td>
<td>Terminal Block</td>
</tr>
</tbody>
</table>

### Agency Compliance

**Electrical safety:** UL1778, CSA C22.2 No. 107.3, EN62040-1
**EMC:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

*Ethernet SNMP card is standard on the 120Vac model and optional on the 230Vac model
***CE applies to 230Vac version only
FXM 1100

Rugged UPS Module

- 1100W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Independently programmable control and report dry contacts allow monitoring and controlling of key functions
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
- Local and remote monitoring and control via RS232 port and Ethernet SNMP interface*
- UPS panels can be rotated, improving usability and viewing convenience

Consult your Alpha representative for P/N configurations

### Electrical

**120Vac Model**
- Battery string voltage: 48Vdc
- Nominal voltage: 120Vac
- Nominal frequency: Auto-sensing
- Input:
  - Current: 15.5A (@ nominal voltage and max battery charging current)
  - Voltage: 85 to 175Vac
- Output:
  - Voltage regulation: ±10% over input voltage range
  - Power at 55°C: 1100W/VA

**230Vac Model**
- Battery string voltage: 48Vdc
- Nominal voltage: 230Vac
- Nominal frequency: Auto-sensing
- Input:
  - Current: 8A (@ nominal voltage and max battery charging current)
  - Voltage range: 150 to 328Vac
- Output:
  - Voltage regulation: ±10% over input voltage range
  - Power at 55°C: 1100W/VA

### Mechanical

- Dimensions:
  - mm: 133H x 394W x 222D
  - inches: 5.22H x 15.5W x 8.75D
- Weight: 16kg (35lbs)

### Environmental

- Operating temp range*: -40 to 74°C (-40 to 165°F)
- Audible noise @ 25°C: 45dBA @ 1 meter (39in)
  *Derates after 55°C

### Performance

- Typical output voltage THD: <3%
- Typical efficiency: >98% (resistive load)
- Typical transfer time: <5ms

### Power Connector Options

<table>
<thead>
<tr>
<th>120Vac Model</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Terminal Block</td>
<td>Terminal Block</td>
</tr>
<tr>
<td>Optional</td>
<td>Terminal Block</td>
<td>Dual 5-15R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>230Vac Model</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Terminal Block</td>
<td>Terminal Block</td>
</tr>
<tr>
<td>Optional</td>
<td>IEC*</td>
<td>IEC*</td>
</tr>
</tbody>
</table>

*FXM models with IEC connectors come with 4 lines LCD display instead of the traditional 2 lines display

### Agency Compliance

- Electrical safety: UL1778, CSA C22.2 No. 107.3, EN62040-1
- Marks: ***CE***
- EMC: CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2
- *Ethernet SNMP card is standard on the 120Vac model and optional on the 230Vac model
- ***CE applies to 230Vac version only*
FXM 2000

Rugged UPS Module

- 2000W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Independently programmable control and report dry contacts allow monitoring and controlling of key functions
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
- Local and remote monitoring and control via RS232 port and Ethernet SNMP interface*
- UPS panels can be rotated, improving usability and viewing convenience

Consult your Alpha representative for P/N configurations

Electrical

120Vac Model
- Battery string voltage: ...48Vdc
- Nominal voltage: ..........120Vac
- Nominal frequency: ......Auto-sensing
- Input:
  - Current:.........................20A (@ nominal voltage and max battery charging current)
  - Voltage: ......................85 to 152Vac
- Output:
  - Voltage regulation: ..............±10% over input voltage range
  - Power at 50°C..............2000W/VA

230Vac Model
- Battery string voltage: ...48Vdc
- Nominal voltage: ..........230Vac
- Nominal frequency: ......Auto-sensing
- Input:
  - Current:.........................12A (@ nominal voltage and max battery charging current)
  - Voltage range: ..........150 to 328Vac
- Output:
  - Voltage regulation: ..............±10% over input voltage range
  - Power at 55°C..............2000W/VA

Mechanical

- Dimensions: 
  - mm: ..............................133H x 394W x 222D
  - inches: .........................5.22H x 15.5W x 8.75D
  - Weight: .........................16kg (35lbs)

Environmental

- Operating temp range*: -40 to 74°C (-40 to 165°F)
- Audible noise @ 25°C: ...45dBa @ 1 meter (39in)
  *120Vac module derates after 50°C. 230Vac module derates after 55°C

Performance

- Typical output voltage THD*: ....<3%
- Typical efficiency*: .................>98% (resistive load)
- Typical transfer time: ...............<5ms

Power Connector Options

<table>
<thead>
<tr>
<th></th>
<th>120Vac Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>230Vac Model</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Agency Compliance

- Electrical safety: ..............UL1778, CSA C22.2 No. 107.3; EN62040-1
- Marks: ................................;
- EMC: ................................CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

*Ethernet SNMP card is standard on the 120Vac model and optional on the 230Vac model
**CE applies to 230Vac version only
Integrated, compact rugged UPS featuring all weather protection with durable outdoor NEMA 3R rated plastic enclosure

Enhanced battery life with wide-range Automatic Voltage Regulation

Local monitoring and control through RS-232 port or remotely via SNMP Ethernet interface*

Independently programmable relays allow monitoring and controlling of key functions

Simplified troubleshooting through event and alarm logging with time and date stamping

Maximum mounting flexibility for accommodation of space requirements**

Magnetic circuit breakers at input and battery for additional protection

Consult your Alpha representative for P/N configurations

### Electrical

#### North America

**Battery string voltage:** 24Vdc

**Input:**
- Nominal voltage: 120Vac
- Nominal frequency: 60Hz
- Current: 2.0A (@ nominal voltage and max battery charging current)
- Voltage range: 85 to 150Vac

**Output:**
- Voltage: Dual 24Vac and 120Vac
- Current: 4.20A @ 24Vac
- 0.83A @ 120Vac

**Power at 50°C:**
- 100 W/VA Total

#### International

**Battery string voltage:** 24Vdc

**Input:**
- Nominal voltage: 230Vac
- Nominal frequency: 50Hz
- Current: 1.0A (@ nominal voltage and max battery charging current)
- Voltage range: 154 to 323Vac

**Output:**
- Voltage: Dual 24Vac and 230Vac
- Current: 4.20A @ 24Vac
- 0.43A @ 230Vac

**Power at 50°C:** 100 W/VA Total

### Mechanical

**Dimensions:**
- mm: 292H x 381W x 152D
- inches: 11.5H x 15W x 6D

**Weight:**
- (w. 4 x 9Ah batteries): 20.4kg (45lbs)

### Environmental

**Temperature***:** -40 to 50°C (-40 to 122°F)

**Enclosure Rating:** NEMA 3R

### Performance

**Typical output voltage THD:** <3% (inverter mode)

**Typical efficiency:** >96% (resistive load)

**Typical transfer time:** <5ms

**Run time****:** 2 hrs 15 mins @ full load

### Agency Compliance

**Electrical safety:** UL1778, CSA C22.2 No. 107.3; EN62040-1

**EMC:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

*SNMP card is optional

**Mounting bracket for pole mount sold separately

***Requires heater mat at lower temperatures

****Using 4 x 9Ah batteries @ 25°C

*****CE applies to 230Vac version only

---

Outdoor UPS System

Micro Secure 100
Compact, integrated UPS system designed to operate in extreme environments; providing maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances.

Up to 11 hours backup time at full load (350W) for extended system continuity.

NEMA 3R rated enclosure for superior performance in outdoor applications.

Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag.

Local and remote monitoring and control via USB port and Ethernet SNMP interface.

Temperature compensated battery charging automatically adjusts charge voltage extending the life of the battery.

### Mechanical

#### Alpha Micro

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm</th>
<th>500H x 358W x 294D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (w/o batteries)</td>
<td>kg</td>
<td>56lbs</td>
</tr>
</tbody>
</table>

#### Alpha Micro XL

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm</th>
<th>776H x 358W x 294D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (w/o batteries)</td>
<td>kg</td>
<td>65lbs</td>
</tr>
</tbody>
</table>

#### Alpha Micro XL3

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm</th>
<th>1330H x 358W x 294D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (w/o batteries)</td>
<td>kg</td>
<td>74lbs</td>
</tr>
</tbody>
</table>

### Environmental

Operating temperature range*: -40 to 74°C (-40 to 165°F)

Audible noise @ 25°C: <45dBa @ 1 meter (39in)

Enclosure rating: NEMA 3R

*Denotes after 50°C

### Performance

Typical output voltage THD: <3%

Typical efficiency: >96% (resistive load)

Typical transfer time: <5ms

### Agency Compliance

Electrical safety: UL1778, CSA C22.2 No. 107.3, EN62040-1

EMC: CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2
Compact, integrated UPS system provides clean, uninterruptable backup power
Wide range Automatic Voltage Regulation 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 monitoring 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

Consult your Alpha representative for P/N configurations

Electrical

120Vac Model
Battery string voltage: ...48Vdc
Input:
Nominal voltage: ........... 120Vac
Nominal frequency: .........60Hz
Current: (@ nominal voltage, max battery charging current)
• Micro: ..................... 14.46A
• MicroXL: .................. 14.92A
• MicroXL3: ................. 15.84A
Voltage range: ........... 85 to 152Vac
Output:
Voltage regulation: ..........±10% over input voltage range
Power @ 50°C: ............. 1000W/VA

230Vac Model
Battery string voltage: ...48Vdc
Input:
Nominal voltage: ........... 230Vac
Nominal frequency: .........50Hz
Current: (@ nominal voltage, max battery charging current)
• Micro: ..................... 7.44A
• MicroXL: .................. 7.68A
• MicroXL3: ................. 8.16A
Voltage range: ........... 150 to 328Vac
Output:
Voltage: .................... 230Vac
Voltage regulation: ..........±10% over input voltage range
Power @ 50°C: ............. 1000W/VA

Performance
Typical output voltage THD:..<3%
Typical efficiency: .............>98% (resistive load)
Typical transfer time: ..........<5ms
Run time @25°C**: .......... 4 x 50Ah batteries - 1 hrs 15 mins (Micro XL)

* This applies to the UPS module only. Batteries may require a heater mat at lower temperatures. Output power derates after 50°C
**Run time on battery power can vary based on loads, temperature and battery. Other battery options are available.

Mechanical

Alpha Micro
Dimensions
mm 500H x 358W x 294D
inches 19.7H x 14.1W x 11.6D
Weight (w/o batteries) 19.7kg (43.4lbs)

Alpha Micro XL
Dimensions
mm 776H x 358W x 294D
inches 30.6H x 14.1W x 11.6D
Weight (w/o batteries) 19.7kg (49.8lbs)

Alpha Micro XL3
Dimensions
mm 1330H x 358W x 294D
inches 52.4H x 14.1W x 11.6D
Weight (w/o batteries) 22.6kg (69.2lbs)

Environmental
Temperature range: ......-40 to 74°C (-40 to 165°F)*
Humidity: ................... 15% to 95% RH non condensing
Audible noise@25°C: ........<45dBA @ 1 meter (39in)
Enclosure rating: .......... NEMA 3R
*Derates after 50°C

Agency Compliance
Electrical safety: .......... UL1778, CSA C22.2 No. 107.3; EN62040-1
EMC: ....................... CFR47, Part 15 Subpart B, Class A; CEE-003
Marks: ....................... ULC, CE

Other battery options are available.
### ALPHA MICRO 300-12

**UPS and Enclosure**

- Compact, integrated UPS system designed to operate in extreme environments
- Provides maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Local and remote monitoring and control via RS232 port and optional Ethernet SNMP interface
- A wide operating temperature range of -40 to 60°C (-40 to 140°F) is suitable for most OSP operating environments
- Can power up to 4 Adtran TA 380 (50W each) while occupying a small 20" x 14" footprint.
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery

#### Mechanical

<table>
<thead>
<tr>
<th>Part Number: 017-237-27**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
</tr>
<tr>
<td><strong>Battery string voltage:</strong> 24Vdc</td>
</tr>
<tr>
<td><strong>Input:</strong></td>
</tr>
<tr>
<td>Nominal voltage: ..........120Vac</td>
</tr>
<tr>
<td>Nominal frequency:.........60Hz</td>
</tr>
<tr>
<td>Current:....................3.6A nominal, 5.4A max</td>
</tr>
<tr>
<td>Voltage range:.............85 to 152Vac</td>
</tr>
<tr>
<td><strong>Output:</strong></td>
</tr>
<tr>
<td>Voltage: ...................12Vdc</td>
</tr>
<tr>
<td>Current:...................16A 120Vac (4 x 4A)</td>
</tr>
<tr>
<td>Voltage regulation: .......±1.5%</td>
</tr>
<tr>
<td>Power @ 50°C:.............200W (4 x 50W)</td>
</tr>
</tbody>
</table>

**Performance / Features**

- **Run time**: 2 x AlphaCell 85GXL (50Ah) >2 hrs @ 25°C

*Runtime is contingent upon load profile, battery age and ambient temperature.

**Batteries not included. For XL and XL3 configurations, consult your Alpha representative.

**Agency Compliance**

- **Electrical safety:** UL1778, CSA 22.2 No. 107.3
- **NEMA:** 3R
- **Marks:**

---

**Dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>Alpha Micro</th>
<th>Alpha Micro XL</th>
<th>Alpha Micro XL3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>mm</td>
<td>inches</td>
<td>inches</td>
</tr>
<tr>
<td>Alpha Micro</td>
<td>500H x 358W x 294D</td>
<td>19.7H x 14.1W x 11.6D</td>
<td>19.7kg (43.4lbs)</td>
</tr>
<tr>
<td>Alpha Micro XL</td>
<td>776H x 358W x 294D</td>
<td>30.6H x 14.1W x 11.6D</td>
<td>19.7kg (49.8lbs)</td>
</tr>
<tr>
<td>Alpha Micro XL3</td>
<td>1330H x 358W x 294D</td>
<td>52.4H x 14.1W x 11.6D</td>
<td>22.6kg (69.2lbs)</td>
</tr>
</tbody>
</table>
Indoor UPS Solutions

Alpha also offers a complete line of AC powering solutions for indoor applications. Like Alpha’s hardened outdoor UPS solutions, our indoor UPS portfolio offers superior remote communication and monitoring capabilities including SNMP web-based communication for checking status and alert notifications to your mobile device.

All Alpha indoor UPS models deliver solid reliability, functionality and efficiency you can depend on.
CONTINUITY 1000-3000

Convertible Indoor On-line UPS Series

- Feature rich on-line UPS series with rack / tower convertible design and 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 code
- Programmable receptacles enable flexible power backup
- Powerful built-in charger shortens battery charging time and extends runtime
- Hot swappable battery allows replacement without interruption to critical loads

### Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Continuity 1000</th>
<th>Continuity 2000</th>
<th>Continuity 3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>120Vac Part Numbers*</td>
<td>0170009</td>
<td>0170010</td>
<td>0170011</td>
</tr>
</tbody>
</table>

#### Input
- **Voltage window**: 60–144Vac for 120V system
- **Frequency**: 50/60 ±5% (Auto Sensing)
- **Phase/Wire**: Single, Line + Neutral + Ground
- **Power factor**: >0.99 (Full Load)

#### Output
- **Voltage**: 100/110/115/120/127Vac
- **Voltage regulation**: <±0.1% until low battery warning
- **Capacity**: 1000VA/800W, 2000VA/1600W, 3000/2400W
- **Power factor**: 0.8° Lagging
- **Wave form**: Sine Wave, THD<3% (no load to full load)
- **Frequency stability**: ±0.1% unless synchronized to line
- **Frequency regulation**: 3Hz or 1Hz (Setting by software)
- **Transfer time**: 0 m sec
- **Crest factor**: 3:1
- **Efficiency (AC to AC)**: >85%, >88%
- **Autonomy (80% load)**: 7.9 mins, 6.5 mins
- **DC start**: Yes

#### Battery
- **Type**: Sealed Lead Acid Maintenance Free
- **Capacity**: 7Ah, 7Ah, 9Ah
- **Quantity**: 3, 6, 6
- **Voltage**: 36Vdc, 72Vdc, 72Vdc
- **Recharge time**: 3 hours to 90%
- **Built-in charger (max. charging current)**: 1.5A, 2.1A, 2.7A

*Consult your Alpha representative for 230Vac Part Numbers
<table>
<thead>
<tr>
<th>Model</th>
<th>Continuity 1000</th>
<th>Continuity 2000</th>
<th>Continuity 3000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED</td>
<td>Normal, Battery, Bypass, Programmable Outlet 1, Programmable Outlet 2, Self-Test, Battery Weak &amp; Bad, Site Wiring Fault, Fault Overload, and Load/Battery Level conditions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key</td>
<td>On button / Off button (Test / Alarm silence button)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-diagnostics</td>
<td>Upon Power On and Software Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication slots</td>
<td>Relay contact board or SNMP card</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload AC mode &amp; backup mode (delay before switching to bypass)</td>
<td>&lt;105% continuously.</td>
<td></td>
<td>&gt;150% immediately transfer to bypass Buzzer continuously alarms</td>
</tr>
<tr>
<td></td>
<td>&gt;106%–120% for 30 seconds transfer to bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;121%–150% for 10 seconds transfer to bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bypass mode</td>
<td>&lt;105% continuously</td>
<td>&gt;149%–157% for 2 seconds shut down</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;106%–120% for 250 seconds shut down</td>
<td>&gt;158%–176% for 1 second shut down</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;121%–130% for 125 seconds shut down</td>
<td>&gt;177%–187% for 0.32 seconds shut down</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;131%–135% for 50 seconds shut down</td>
<td>&gt;188% for 0.16 seconds shut down</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;136%–145% for 20 seconds shut down</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;146%–148% for 5 seconds shut down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short circuit</td>
<td>Hold Whole System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overheat</td>
<td>AC Mode: Switch to Bypass, Backup Mode: UPS shuts down immediately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery low</td>
<td>Alarm and Switch Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPO</td>
<td>UPS shuts down immediately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>Advanced Battery Discharge Management (ABDM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise suppression</td>
<td>115V System</td>
<td>400 Joules</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230V System</td>
<td>300 Joules</td>
<td></td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audible and visual</td>
<td>Line Failure, Battery Low, Overload, System Fault Conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm</td>
<td>440W x 88H x 405D</td>
<td>440W x 88H x 650D</td>
</tr>
<tr>
<td></td>
<td>inches</td>
<td>17.3W x 3.5H x 16D</td>
<td>17.3W x 3.5H x 25.6D</td>
</tr>
<tr>
<td>Input connector</td>
<td>5-15P</td>
<td>5-20P</td>
<td>L5-30P</td>
</tr>
<tr>
<td>Outlets 120Vac</td>
<td>6 x NEMA 5-15R</td>
<td>2x5-15R + 2 x 5-20R</td>
<td>4x5-15R + 1xL5-30R</td>
</tr>
<tr>
<td>Outlets 230Vac</td>
<td>6 x IEC320-C13</td>
<td></td>
<td>4 x IEC320-C13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 x IEC320-C19</td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>15.1kg (33.3lbs)</td>
<td>27.9kg (61.5lbs)</td>
<td>29.7kg (65.4lbs)</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0–40°C (32-104°F)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>0–2000m/6600ft up to 40°C (104°F), 3000m/9900ft up to 35°C (95°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH Maximum, Non-Condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>&lt;50dB (at 1m/3.3ft)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Computer Interface</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface type</td>
<td>Standard RS232 and USB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication slot</td>
<td>Dry Contact Card or SNMP card</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agency Compliance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety standard</td>
<td>EN62040-1 complied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>EN62040-3 complied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC standard</td>
<td>EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks</td>
<td>CE, UL, cUL, FCC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Battery Pack</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>BP Continuity 1000</td>
<td>BP Continuity 2000</td>
<td>BP Continuity 3000</td>
</tr>
<tr>
<td>Part Numbers</td>
<td>0320004-001</td>
<td>0320005-001</td>
<td>0320006-001</td>
</tr>
<tr>
<td>Battery type</td>
<td>7Ah</td>
<td>7Ah</td>
<td>9Ah</td>
</tr>
<tr>
<td>Output voltage</td>
<td>36Vdc</td>
<td>72Vdc</td>
<td>72Vdc</td>
</tr>
<tr>
<td>Battery quantity</td>
<td>12pcs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit weight</td>
<td>38kg (83.8lbs)</td>
<td>38kg (83.8lbs)</td>
<td>44.6kg (83.8lbs)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm</td>
<td>88H x 440W x 650D</td>
<td></td>
</tr>
<tr>
<td></td>
<td>inches</td>
<td>3.5H x 17.3W x 25.6D</td>
<td></td>
</tr>
</tbody>
</table>

*Based on load(%): 0–33/33–66/66–100% respectively. ** Operation 0–3°C (54°F) if the power factor is at 0.8. Specifications are subject to change without prior notice.
Feature rich on-line 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 code
Hot swappable battery allows replacement without interruption to critical loads

Nominal Specifications

<table>
<thead>
<tr>
<th>Models</th>
<th>Continuity 6K</th>
<th>Continuity 10K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
<td>0170012</td>
<td>0170013</td>
</tr>
<tr>
<td>Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage window</td>
<td>160–280Vac</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>45–65Hz</td>
<td></td>
</tr>
<tr>
<td>Phase/Wire</td>
<td>Single, Line + Ground</td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td>Up to 0.99 at 100% Linear Load</td>
<td>Up to 0.99 at 100% Linear Load</td>
</tr>
<tr>
<td>Current THD (100% linear load)</td>
<td>&lt;7%</td>
<td>&lt;7%</td>
</tr>
<tr>
<td>Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage window</td>
<td>200/208/220/240Vac Selectable (208/120Vac* optional)</td>
<td>10000VA/9000W</td>
</tr>
<tr>
<td>Voltage adjustment</td>
<td>Nominal +1%, +2%, +3%, -1%, -2% or -3%</td>
<td></td>
</tr>
<tr>
<td>Voltage regulation</td>
<td>±1%</td>
<td>±2%</td>
</tr>
<tr>
<td>Capacity</td>
<td>6000VA/5400W</td>
<td>10000VA/9000W</td>
</tr>
<tr>
<td>Rated power factor</td>
<td>0.9 Lagging</td>
<td>0.9 Lagging</td>
</tr>
<tr>
<td>Wave form</td>
<td>Sine Wave, THD&lt;3% (no load to full load)</td>
<td></td>
</tr>
<tr>
<td>Frequency stability</td>
<td>±0.2% (Free Running)</td>
<td></td>
</tr>
<tr>
<td>Frequency regulation</td>
<td>±1Hz; ±3Hz</td>
<td></td>
</tr>
<tr>
<td>Transfer time</td>
<td>0ms</td>
<td></td>
</tr>
<tr>
<td>Crest factor</td>
<td>3:1</td>
<td></td>
</tr>
<tr>
<td>Efficiency (AC to AC, normal)</td>
<td>Up to 90%</td>
<td>Up to 95%</td>
</tr>
<tr>
<td>Efficiency (AC to AC, ECO)</td>
<td>Up to 95%</td>
<td></td>
</tr>
<tr>
<td>Autonomy (80% load with 1 external battery pack)</td>
<td>7.1 mins</td>
<td>4.8 mins (no internal batteries in UPS)</td>
</tr>
<tr>
<td>DC start</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

*120Vac output requires optional transformer module
<table>
<thead>
<tr>
<th>Model</th>
<th>Continuity 6K</th>
<th>Continuity 10K</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status On LED + LCD</td>
<td>Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, Transferring with interruption &amp; UPS Fault.</td>
<td></td>
</tr>
<tr>
<td>Readings on LCD</td>
<td>Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage &amp; Inner Temperature.</td>
<td></td>
</tr>
<tr>
<td>Self-diagnostics</td>
<td>Upon Power-on, Front Panel Setting &amp; Software Control, 24-hour routine checking</td>
<td></td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audible and visual</td>
<td>Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions</td>
<td></td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload (w/simulated thermal tripping I-T Curve)</td>
<td>Bypass Supply: 105%~200% for 500 seconds – 8 cycles before stopping supply load.</td>
<td>Overload Supply: 105%~150% for 160 seconds – 2 cycles before switching bypass.</td>
</tr>
<tr>
<td>Short circuit</td>
<td>Switch off Immediately</td>
<td></td>
</tr>
<tr>
<td>Overheat</td>
<td>AC Mode: Switch to Bypass</td>
<td>AC Mode: Switch to Bypass</td>
</tr>
<tr>
<td>Battery low</td>
<td>Alarm and Switch Off</td>
<td>Alarm and Switch Off</td>
</tr>
<tr>
<td>Noise suppression</td>
<td>Complies with EN62040-2</td>
<td></td>
</tr>
<tr>
<td>Spike suppression</td>
<td>Complies with EN61000-4-5</td>
<td></td>
</tr>
<tr>
<td><strong>Heat dissipation</strong></td>
<td>Without Isolated Transformer Module: &lt;450W</td>
<td>10K: &lt;600W</td>
</tr>
<tr>
<td></td>
<td>With Isolated Transformer Module: &lt;615W</td>
<td>10KP: &lt;550W</td>
</tr>
<tr>
<td>Leakage current</td>
<td>&lt;3mA at Full Load</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm: 88H x 440W x 680D</td>
<td>mm: 132H x 440W x 680D</td>
</tr>
<tr>
<td></td>
<td>inches: 3.46H x 17.3W x 26.8D</td>
<td>inches: 5.2H x 17.3W x 26.8D</td>
</tr>
<tr>
<td>Input/Output connection</td>
<td>Hardwire</td>
<td></td>
</tr>
<tr>
<td>External battery connection</td>
<td>Plug-in &amp; Play</td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>24kg (52.9lbs)</td>
<td>26.0kg (57.3lbs)</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0-40°C (32-104°F)</td>
<td></td>
</tr>
<tr>
<td>Temperature warning</td>
<td>The battery design life is based on a temperature of 25°C (77°F). Ambient temperature above this range will affect battery life.</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>0~2000M/6600ft up to 40°C (104°F), 3000M/9900ft up to 35°C (95°F)</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>90% RH Maximum, Non-Condensing</td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>&lt;50dB (at 1M/3.3ft)</td>
<td></td>
</tr>
<tr>
<td><strong>Computer Interface</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface type</td>
<td>Standard RS232</td>
<td></td>
</tr>
<tr>
<td>Communication slot</td>
<td>2nd RS232, USB, RS485, Dry Contact Card or SNMP Card</td>
<td></td>
</tr>
<tr>
<td><strong>Agency Compliance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety standard</td>
<td>EN62040-1-1, UL1778</td>
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<tr>
<td>EMC standard</td>
<td>EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A</td>
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</tr>
<tr>
<td>Marks</td>
<td>CE, cUL, UL</td>
<td></td>
</tr>
<tr>
<td><strong>Battery Pack</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>BP Continuity 6K</td>
<td>BP Continuity 10K</td>
</tr>
<tr>
<td>Part Numbers</td>
<td>0320007-001</td>
<td>0320008-001</td>
</tr>
<tr>
<td>Battery type</td>
<td>7Ah</td>
<td>9Ah</td>
</tr>
<tr>
<td>Battery quantity</td>
<td>20pcs</td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>240Vdc</td>
<td></td>
</tr>
<tr>
<td>Unit weight</td>
<td>54.2kg (119.49lbs)</td>
<td>65.2kg (143.74lbs)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm: 132H x 440W x 680D</td>
<td>mm: 65.2kg (143.74lbs)</td>
</tr>
<tr>
<td></td>
<td>inches: 5.2H x 17.3W x 26.8D</td>
<td></td>
</tr>
<tr>
<td><strong>Step-Down Transformer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Continuity 6K Transformer</td>
<td>Continuity 10K Transformer</td>
</tr>
<tr>
<td>Part Numbers</td>
<td>7400117</td>
<td>7400118</td>
</tr>
<tr>
<td>Input voltage</td>
<td>208Vac</td>
<td>208Vac</td>
</tr>
<tr>
<td>Output voltage</td>
<td>Configurable 120Vac or 120/208Vac or 120/240Vac</td>
<td>Configurable 120Vac or 120/208Vac or 120/240Vac</td>
</tr>
<tr>
<td>Unit weight</td>
<td>42kg (92.6lbs)</td>
<td>53kg (116.84lbs)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm: 88H x 440W x 680D</td>
<td>mm: 132H x 440W x 680D</td>
</tr>
<tr>
<td></td>
<td>inches: 3.46H x 17.3W x 26.8D</td>
<td>inches: 5.2H x 17.3W x 26.8D</td>
</tr>
<tr>
<td><strong>Standard Solutions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fiber Network Powering Solutions

Now available to over 20 million North American households, fiber is fast becoming the technology of choice for next-generation, high-speed access to Internet, video and emerging applications. Alpha offers a complete portfolio of fiber powering options with the FlexPoint™ line of 12Vdc single-family 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 excel in the most demanding environmental conditions while optimizing battery life and performance.
FLEXNET™ MPS 48-7

MPS48-7F & MPS48-7T 50W 48Vdc Indoor/Outdoor UPS

- Rugged 48Vdc 50W wall or pole mountable UPS
- LED local status indicators
- Local and remote status monitoring and reporting
- Temperature compensated battery charging for optimum battery life
- Optional battery heater provides extended runtimes in cold conditions
- MPS48-7F supports fiber-to-the-home applications including MDU, MTU and SBU ONT loads
- MPS48-7T supports critical network communication loads

**FlexNet MPS48-7F P/N: 021-511-10-030**
**FlexNet MPS48-7T P/N: 021-511-10-040**
**120V Battery Heater Mat Kit: 189-078-21**
**240V Battery Heater Mat Kit: 189-312-10**

### Electrical

- **AC input voltage:** 90 to 132, or 180 to 264Vac (switch selectable) or 250 to 305Vac with optional step-down transformer
- **AC input frequency:** 47 to 63Hz
- **Output power:** 50W continuous
- **Output voltage:** 42 to 56Vdc
- **Ripple:** <250mVrms
- **Noise:** <2Vp-p

### Performance / Features

- **Battery:** Four x 7Ah Valve Regulated Lead Acid (VRLA) (Batteries sold separately)

### Mechanical

- **Dimensions:** 445H x 324W x 133D mm
- **Weight (w/o batteries):** 4.9kg (11lbs)

### Environmental

- **Operating temperature:**
  - with heater option: -40 to 55°C (-40 to 131°F)
  - without heater option: -20 to 55°C (-4 to 131°F)
- **Storage temperature:** -50 to 70°C (-58 to 158°F)
- **Humidity:** 0 to 95%
- **Altitude:** Up to 10000ft (3048M) with ambient de-rating Above 6000ft (1828.8m), 2°C/1000ft (304.8m)

### Agency Compliance

- FCC/GR1089 Class B
- CSA-NRTL/C (CSA60950)
- CE
- C-Tic
- Seismic Zone 4 rated per GR-63
- Complies with IPx5 water intrusion criteria per IEC 60529 standard
150W Fibre-to-the-premise UPS for multiple dwelling, multiple tenant and small business unit applications

Supports one or two MDU/SBU ONTs located up to 100ft from FMPS

Battery management performs periodic battery capacity testing and status reporting to the ONT and customer

Built-in battery heater provides extended runtime for applications in cold winter conditions

Hybrid 16AWG and alarm cable minimizes installation labor

Status indicators and audible alarm provide local status

Option for dry contact and Packet Cable compliant telemetry connections to ONT and MTA

---

### Electrical

**AC input:**
- Voltage: 90 to 320 Vac
- Frequency: 45 to 66 Hz

**Surge protection:** ANSI/IEEE Std. C62.41 to Category A, B, or C requirements, using a “Ring Wave” or “Combination” waveform, at a level of 6kV

**Output:**
- Operational: 150W continuous - 170W, 10 sec max.
- Voltage: 48 to 58Vdc with AC power
- Current: 3.1A typical (crowbar limited beyond 5A DC)
- Power loading: Following GR-909 telephone lines in various states, e.g., ringing, off-hook, on-hook, data, and video operation requirements.

**Ripple:** Less than 3mVrms

**Noise:** Less than 100mVp-p

**Output connection:** Two terminal blocks accepting 16AWG, parallel connections

### Performance / Features

**Battery:** Four or eight 7.2Ah or 8Ah valve regulated lead acid (VRLA) (batteries sold separately)

### Mechanical

<table>
<thead>
<tr>
<th>Model</th>
<th>FMPS</th>
<th>FMPS + shipping carton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>in</td>
<td>14W x 23.75H x 5.5D</td>
</tr>
<tr>
<td>cm</td>
<td>35.6W x 60.3H x 14D</td>
<td>35.6W x 60.3H x 14D</td>
</tr>
<tr>
<td>Weight</td>
<td>11.3kg (25lbs)</td>
<td>13.6kg (30lbs)</td>
</tr>
</tbody>
</table>

### Agency Compliance

CSA/UL 60950, EN 60950, EN 55022 class B, FCC part 15 class B, GR-63 Sect 4.2 fire resistance, GR-1089 Sect 3 emissions, Sect 4 lightning and AC power fault, Sect 7 electrical safety, CE, C-Tick, RoHS 5 of 6
# FLEXNET™ ELPM-300

Element Powering - 48Vdc 300W UPS

- Rugged 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
- Visual and electrical indicators for on-site and remote reporting
- Flexible cabinet mounting options – wall, pole or pedestal mount

<table>
<thead>
<tr>
<th>ELPM 300-48 56V Maximum output P/N: 010-322-22</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
</tr>
<tr>
<td>AC input voltage: .......................... 85 to 170Vac or 132 to 264Vac selectable</td>
</tr>
<tr>
<td>AC input frequency: .......................... 50 or 60Hz</td>
</tr>
<tr>
<td>Surge protection: ............................ IEEE Std C62.41-1991 level C</td>
</tr>
<tr>
<td>Output power (max): .......................... 300W</td>
</tr>
<tr>
<td>Output voltage: .............................. 48Vdc (42 to 54Vdc)</td>
</tr>
<tr>
<td>Ripple (DC): ................................. 500mVrms</td>
</tr>
<tr>
<td>Transfer characteristics: ........................ Uninterrupted output</td>
</tr>
</tbody>
</table>

- Performance / Features
- Battery: ................................. 4 x 50AH (85GXL) VRLA Gel batteries (sold separately)
- Battery charging: ........................ Temperature compensated
- Backup time approx.: ...................... 8hrs @ 270W load
- Reverse battery polarity protection

- Mechanical
- Dimensions: ................................ 152H x 256W x 83D
- Weight: ................................. 4.5kg (10lbs)
- Mounting: ................................ Bracket mounted inside enclosure

## Environmental

| Temperature:                                      |
| Operating: .................................. -40 to 65°C (-40 to 149°F) |
| Storage: .................................... -50 to 70°C (-58 to 158°F) |
| Humidity: .................................... 0 to 95% non-condensing |

## User Interface

**LED Indicators**
- Green: ...................................... Output
- Green blinking: ....................... Standby
- Red blinking: ......................... Low/missing battery
- Red: ...................................... Replace battery

**Alarm Indicators**
- AC FAIL (TELM 1)
- Replace battery (TELM 2)
- Battery missing (TELM 3)
- Battery low (TELM 4)

Note: Compliant with PacketCable™ UPS specifications
Embedded MTA Primary Line Support specifications

## Agency Compliance

- FCC part 15 Class B
- CSA–NRTL\(\)C (CSA950)
Rugged 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
- Visual and electrical indicators for on-site and remote reporting
- Flexible cabinet mounting options – wall, pole or pedestal mount

Consult your Alpha representative for P/N configurations

LPE Enclosure Specifications

Dimensions:
- mm: 661H x 420W x 305D
- inches: 26H x 16.5W x 12D
- Weight: 11.3kgs (25lbs)
- Material: Exterior powder coated aluminum
- Number of batteries: 4 x 12Vdc 17Ah VRLA batteries
- Door and lid seal: Poron gasketing
- Approx. backup time: 4 Hours at 250W load

Number of batteries:
- 4 x 12Vdc 50Ah (8SGXL) batteries

Approx. backup time:
- 8 Hours at 275W load

Enclosure mounting and door - PMR series:
- Galvanized steel brackets for wood, and concrete pole mount and wall mount

Enclosure mounting and door - GMR series:
- Precast polymer concrete pad or PS-6/PS-6XL pedestal systems

Fiber strain relief tie bar optional:
- 19” mounting provides ability to strain relief fiber cable plugged into the front of communications equipment

Splice tray:
- Splice Tray Kit (12 count), includes Splice tray with Elastomer Splice Block, Felt Tape, Tie Wraps, Cover and Recording Label

Fiber management panel:
- Provides fiber slack storage and secures a splice tray using a Velcro strap. Tie wrap slots on sides permit securing fiber cables to panel
FLEXPOINT™ AX SERIES

FTTP ONT UPS System

- Scalable FTTP/FTTX power supply systems with or without standby
- Full or partial outdoor configurations
- Outdoor rated including battery for 24/7 availability
- Utility meter base provides most reliable source of AC power at home
- Safe, low-voltage distribution
- 30W with battery module, 24W without battery module

Consult your Alpha representative for P/N configurations

Electrical

AC input voltage
AX30-12D-HC: ............... 95 to 132Vac (120Vac nominal)
AX30-12D-SFPC: ............... 216 to 254V AC (240Vac nominal)
AC input frequency: ............... 50 to 60Hz for AX30-12D-HC
60Hz for AX30-12D-SFPC

Note: International AC selections and line cords available.

DC output voltage
SFPC/HC + BBPS (UPS system): ... 10.5 to 14.4Vdc
SFPC/HC (non UPS): ............... 11.6Vdc

Continuous output power
SFPC/HC + BBPS (UPS system): ... 30W at nominal battery float voltage
SFPC/HC (non UPS): ............... 24W
Current limit: ............... 2.4A current limit (HC),
3.2A current limit (SFPC)

Short circuit protection: ............... Electronic
DC ripple: ............... 150mV

Performance / Features

Type: ............... Maintenance-free, leak-proof, sealed
VRLA (valve regulated lead acid)

Typical recharge time:
AX-12D-BBPS-7.2: ............... <16hrs with 24W
AX-12D-BBPS-17 load: ............... <36hrs with 24W load

Environmental

Operating temperature range
AX-30-12D-SFPC + BBPS: ............... -40 to 45°C (-40 to 113°F)
AX30-12D-HC + BBPS: ............... -40 to 45°C (-40 to 113°F)
AX-30-12D-HC: ............... -40 to 45°C (-40 to 113°F)
AX30-12D-SFPC: ............... -40 to 65°C (-40 to 149°F) unit
derates above 55°C (131°F)

Humidity: ............... 0 to 95%
Battery storage: ............... -15 to 65°C (5 to 149°F)
0 to 95% humidity

Elevation:
- Operation max: ............... 10,000ft (3000m)
- Storage max: ............... 50,000ft (15000m)

Status Alarms
Local (LED indicators):
- Green Steady: ............... Output OK
- Green Blinking: ............... Standby operation
- Red Steady: ............... Replace battery
- Red Blinking: ............... Battery missing/battery low

Remote (Status Alarms – PacketCable Compliant):
- AC Fail: ............... Output power drawn from battery
- Replace Battery: ............... Battery has failed periodic self-test
- Battery Missing: ............... Battery is disconnected
- Battery Low: ............... Battery has 20% remaining runtime

Agency Compliance

Home Converter: ............... NRTL/C LPS, FCC Part 15 Class B, UL/CSA UL 60950-1
Power Ring: ............... UL414
Power Ring Converter: ............. UL60950-1, UL SU2745
BBPS Modules: ............... NRTL/C

FlexPoint UPS runtimes (mins) over temperature

<table>
<thead>
<tr>
<th>Load/Temp</th>
<th>-40°C/-40°F</th>
<th>-20°C/-4°F</th>
<th>25°C/ 77°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7W</td>
<td>360</td>
<td>560</td>
<td>800</td>
</tr>
<tr>
<td>10W</td>
<td>160</td>
<td>360</td>
<td>500</td>
</tr>
<tr>
<td>15W</td>
<td>110</td>
<td>195</td>
<td>320</td>
</tr>
<tr>
<td>18W</td>
<td>80</td>
<td>156</td>
<td>240</td>
</tr>
<tr>
<td>20W</td>
<td>60</td>
<td>130</td>
<td>210</td>
</tr>
<tr>
<td>25W</td>
<td>50</td>
<td>100</td>
<td>170</td>
</tr>
<tr>
<td>30W</td>
<td>30</td>
<td>80</td>
<td>130</td>
</tr>
</tbody>
</table>

FlexPoint UPS runtimes (mins) over temperature

<table>
<thead>
<tr>
<th>Load/Temp</th>
<th>-40°C/-40°F</th>
<th>20°C/-4°F</th>
<th>25°C/ 77°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>10W</td>
<td>750</td>
<td>1080</td>
<td>1240</td>
</tr>
<tr>
<td>15W</td>
<td>400</td>
<td>680</td>
<td>940</td>
</tr>
<tr>
<td>20W</td>
<td>260</td>
<td>440</td>
<td>680</td>
</tr>
<tr>
<td>25W</td>
<td>160</td>
<td>340</td>
<td>480</td>
</tr>
<tr>
<td>30W</td>
<td>140</td>
<td>232</td>
<td>400</td>
</tr>
</tbody>
</table>
Power-Ring
Compatible with ring and ringless style meter sockets and provides a receiving socket for the FlexPoint AC to DC Power-Ring converter module. Depending on the model, the Power-Ring can tap the AC power before or after the meter and comes supplied with a blanking plate.

175A continuous, 240A rated
• AX-POWER-RING-A (power tap after meter) — P/N: 021-053-10-021
• AX-POWER-RING-B (power tap before meter) — P/N: 021-053-10-020

Dimensions:
mm:........... 120H x 178Dia
in:............. 4.75H x 7.0Dia
Weight:........... 0.68kg (1.5lbs)

Home Converter
Contains highly-reliable environmentally-hardened 120Vac to 12Vdc converter circuitry in a wall mount housing. Comes with a two-conductor AC line cord and should be mounted in locations sheltered from rain or snow. Outputs 24W and 11.6Vdc as a stand-alone module or supports 30W and 11.6 to 16Vdc battery backup power supply (BBPS) module output.

AX30-12D-HC — P/N: 010-318-10-039
Dimensions:
mm:........... 209H x 70W x 38D
in:............. 8.25H x 2.75W x 1.5D
Weight:........... 0.32kg (0.7lbs)

The UPS Modules
Provides the network operator the capability to place the battery management element inside other enclosures located at the subscriber’s home. UPS modules contain the same electronics used in the AX-12D-BBPS products without the battery heater and are to be used with FlexPoint Home converter and Power-Ring converter.

AX-12D-7.2Ah (for 7.2Ah battery) — P/N: 745-816-10-021
AX-12D-17Ah (for 17Ah battery) — P/N: 745-816-10-020

Battery Modules
The Battery Backup Power Supply (BBPS) module outputs 30W of continuous power and includes a microprocessor-based battery charge management system providing the correct charge voltage to the battery over a wide temperature range, while performing periodic battery capacity testing and status reporting to the ONT and customer. The onboard battery heater provides extended standby runtimes in cold conditions to -40˚C (-40˚F). The 7.2Ah battery model provides standard runtimes and the 17Ah model provides extended runtimes.

AX-12D-BBPS-7.2 — P/N: 031-264-10-022
Dimensions:
mm:........... 203H x 230W x 102D
in:............. 8.0H x 9.0W x 4.0D
Weight:........... 0.68kg (1.5lbs)

AX-12D-BBPS-17 — P/N: 031-192-10-032
Dimensions:
mm:........... 355H x 241W x 127D
in:............. 14H x 9.5W x 5.0D
Weight:........... 2.04kg (4.5lbs)

Power-Ring Converter
Contains highly-reliable environmentally-hardened 240Vac to 12Vdc converter circuitry in a pluggable housing. Outputs 30W and 11.6Vdc as a stand-alone module, or supports 30W and 11.4 to 16Vdc battery backup power supply (BBPS) module output.

AX30-12D-SFPC — P/N: 010-318-50
Dimensions:
mm:........... 233H x 152.4W x 44.5D
in:............. 9.2H x 6.0W x 1.75D
Weight:........... 0.52kg (1.14lbs)

Batteries
The FlexPoint AX battery modules use valve regulated lead acid (VRLA) AGM batteries.

7Ah Standard-life battery, 1-year warranty
P/N: 1810007
Weight:........... 2.4kg (5.3lbs)

7Ah Long-life battery with wide temperature range, 3-year warranty, P/N: 1810063
Weight:........... 2.6kg (5.7lbs)
FLEXPOINT™
1208F, 1215, 1232 & 1250
FTTH UPS Power Series

Telecommunications grade power system provides 8W, 15W, 32W & 50W of 12Vdc UPS power for FTTH and radio frequency over glass (RFoG) 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

Enhanced surge protection of 6kV

**Input OPS**

AC input voltage: 110Vac or 240Vac
AC input frequency: 50/60Hz
Surge protection: ANSI/IEEE Std. C62.41 to category A, B or C requirements using a “ring wave” or “combination” waveform at a level of 6kV

**Auxiliary power (use alkaline battery pack)**

Coax jack connector
OD dimensions:
- inches: 0.14
- mm: 3.8
ID dimensions:
- inches: 0.05
- mm: 1.3
Input voltage range: 9.5 – 20Vdc

**Indicators**

**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
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 without AC 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

**Interface**

DC output: Removable screw terminal plug accepts (2) 16AWG and (5) 24AWG wires or F-Type Coaxial (1208F)
AC input: IEC 320/C6 inlet
Line cord: NEMA 5-15 to IEC 320 C5 (other power cords available upon request)

**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-LONGBAT-7: Battery 7.2Ah AGM, 1 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

**Warranty**

FlexPoint 1208F, 1215, 1232 & 1250: 1 year repair or replace
Batteries available: 1 year or 3 year

**Agency Compliance**

System: FCC part 15 Class B, CSA-NRTL/C (60950-1), CE, C-Tick
<table>
<thead>
<tr>
<th>Model</th>
<th>FP1208F</th>
<th>FP1215</th>
<th>FP1232</th>
<th>FP1250</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Number</strong></td>
<td>010-353-20</td>
<td>010-354-20</td>
<td>010-355-20</td>
<td>010-356-20</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>8W max continuous</td>
<td>15W max continuous</td>
<td>32W max continuous</td>
<td>50W max continuous</td>
</tr>
<tr>
<td><strong>Output voltage</strong></td>
<td>12 Vdc nominal (battery voltage upon loss of AC)</td>
<td>12 Vdc nominal (battery voltage upon loss of AC)</td>
<td>12 Vdc nominal (battery voltage upon loss of AC)</td>
<td>12 Vdc nominal (battery voltage upon loss of AC)</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>mm</td>
<td>167.6H x 190.5W x 83.3D</td>
<td>167.6H x 190.5W x 83.3D</td>
<td>—</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>inches</td>
<td>6.6H x 7.5W x 3.2D</td>
<td>6.6H x 7.5W x 3.2D</td>
<td>—</td>
</tr>
<tr>
<td><strong>12Ah battery</strong></td>
<td>mm</td>
<td>167.6H x 190.5W x 109.3D</td>
<td>167.6H x 190.5W x 109.3D</td>
<td>—</td>
</tr>
<tr>
<td><strong>12Ah battery</strong></td>
<td>inches</td>
<td>6.6H x 7.5W x 4.3D</td>
<td>6.6H x 7.5W x 4.3D</td>
<td>—</td>
</tr>
<tr>
<td><strong>Weight w/o battery</strong></td>
<td>0.54 (1.2lbs)</td>
<td>0.54 (1.2lbs)</td>
<td>0.58 (1.3lbs)</td>
<td>0.63 (1.4lbs)</td>
</tr>
<tr>
<td><strong>Battery weight</strong></td>
<td>5.0Ah battery weight</td>
<td>1.8 (3.9lbs)</td>
<td>1.97 (4.3lbs)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Battery weight</strong></td>
<td>6.5Ah battery weight</td>
<td>2.6 (5.7lbs)</td>
<td>2.7 (5.7lbs)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Battery weight</strong></td>
<td>7.2Ah battery weight</td>
<td>2.7 (5.7lbs)</td>
<td>2.7 (5.7lbs)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Battery weight</strong></td>
<td>8.0Ah battery weight</td>
<td>3.8 (6.4lbs)</td>
<td>3.8 (6.4lbs)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-20 to 45°C (4 to 113°F)</td>
<td>-20 to 45°C (4 to 113°F)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-20 to 45°C (4 to 113°F)</td>
<td>-20 to 45°C (4 to 113°F)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>5 to 95% non condensing</td>
<td>5 to 95% non condensing</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Elevation operation maximum</strong></td>
<td>3,000m (10,000ft) derate at 2°C (35.6°F) per 304.8m (1,000ft) above 1,828.8m (6,000ft)</td>
<td>3,000m (10,000ft) derate at 2°C (35.6°F) per 304.8m (1,000ft) above 1,828.8m (6,000ft)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Elevation storage maximum</strong></td>
<td>15,000m (50,000ft)</td>
<td>15,000m (50,000ft)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Models and Input Power Line Cords</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>120VAC 3-conductor NEMA 5-15</strong></td>
<td>FP-1208F-5A</td>
<td>FP-1215-5A</td>
<td>FP-1232-8A</td>
<td>FP-1250-12A</td>
</tr>
<tr>
<td><strong>230VAC 3-conductor Schuko</strong></td>
<td>FP-1208F-5B</td>
<td>FP-1215-5B</td>
<td>FP-1232-8B</td>
<td>FP-1250-12B</td>
</tr>
<tr>
<td><strong>230VAC 3-conductor United Kingdom</strong></td>
<td>FP-1208F-5C</td>
<td>FP-1215-5C</td>
<td>FP-1232-8C</td>
<td>FP-1250-12C</td>
</tr>
<tr>
<td><strong>240VAC 3-conductor Australia/New Zealand</strong></td>
<td>FP-1208F-5D</td>
<td>FP-1215-5D</td>
<td>FP-1232-8D</td>
<td>FP-1250-12D</td>
</tr>
<tr>
<td><strong>120VAC 3-conductor NEMA 5-15 power cord with BC cable</strong></td>
<td>—</td>
<td>—</td>
<td>FP-1232-8-6C</td>
<td>FP-1250-12-6C</td>
</tr>
<tr>
<td><strong>Battery Runtimes</strong></td>
<td>7.5W Load</td>
<td>15W Load</td>
<td>16W Load</td>
<td>32W Load</td>
</tr>
<tr>
<td><strong>5.0Ah battery</strong></td>
<td>5.8 hrs</td>
<td>2.1 hrs</td>
<td>2.0 hrs</td>
<td>1.4 hrs</td>
</tr>
<tr>
<td><strong>6.5Ah battery</strong></td>
<td>7.4 hrs</td>
<td>4.4 hrs</td>
<td>4.2 hrs</td>
<td>1.8 hrs</td>
</tr>
<tr>
<td><strong>7.2Ah battery</strong></td>
<td>13.6 hrs</td>
<td>5.2 hrs</td>
<td>4.9 hrs</td>
<td>2.1 hrs</td>
</tr>
<tr>
<td><strong>8.0Ah battery</strong></td>
<td>13.6 hrs</td>
<td>5.2 hrs</td>
<td>4.9 hrs</td>
<td>2.1 hrs</td>
</tr>
<tr>
<td><strong>12Ah battery</strong></td>
<td>16.7 hrs</td>
<td>8.1 hrs</td>
<td>7.5 hrs</td>
<td>3.4 hrs</td>
</tr>
<tr>
<td><strong>Battery type</strong></td>
<td>Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA)</td>
<td>Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA)</td>
<td>Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA)</td>
<td>Maintenance free, leak-proof, sealed valve regulated lead acid (VRLA)</td>
</tr>
</tbody>
</table>
Controllers and Communications

Whether it’s a UPS being programmed for time of day operation at a traffic intersection or a rectifier plant being monitored remotely via SNMP at a Network Operations Center, Alpha offers a wide array of feature-rich controllers and communications options. The industry-leading Cordex™ Controller features software that offers an outstanding combination of advanced features and reliability. Developed with the end-user in mind, our local and remote controller interfaces present critical information clearly and consistently; whether it’s data logging, event monitoring or fault reporting.

The Cordex™ CXC is Alpha’s family of advanced digital controllers for power system monitoring and control. Cordex™ supervisory controllers come in a wide array of modular designs for integration into Alpha power systems. Alpha’s CXC family of controllers communicates to other power devices in the system via the robust Controller Area Network (CAN) protocol, ensuring the reliable operation of your power solutions. The common Cordex software platform lowers craft training costs by providing technicians with a familiar user interface, whether working on a 10,000 Amp rectifier plant, a shelf-based converter or an AMPS80 Inverter.

A graphic LCD display with touch-screen interface allows simple and convenient set up, control and monitoring of Cordex™ rectifiers. Simple Network Management Protocol (SNMP) based Internet communication and built-in web servers allow complete configuration and monitoring from any location via the Internet using a standard web browser. Events and alarms can be sent to portable devices such as pagers and smart phones.

Cordex™ CXC controllers lower energy and operational expenses, feature standard advanced management features such as innovative PowerSave™ that improves overall system efficiency. Additional features include user definable alarms with custom algorithms, digital and/or analog input monitoring and data logging. Software upgrades are easily downloaded from Alpha’s website for local or remote upload to the controller.
CORDEX™ CONTROLLER FEATURES

General
• **Web based GUI interface:** Web browser support for local or remote control and monitoring of power system

• **Single point setup and control**

• **Power save function:** Improves operational efficiency by running minimum number of rectifier modules required depending on system load

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

• **Email notifications:** Via TCP/IP

• **User programmable logic statements:** Create an event or alarm based on criteria you define

• **Multiple preset alarms:** Ability to configure up to 20 customized alarms

• **Configurable form C relay outputs**

• **Analog and digital inputs**

• **Legacy power system upgrade:** Controls legacy Pathfinder based systems and can be used as a site monitor for any Alpha or 3rd party DC power system

• **System start delay:** Allows delay for other AC powered equipment to start before rectifiers

• **Ramp test control:** Disables fail alarm on no-load conditions

• **Auto voltage adjustment and load sharing**

• **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 generated, and LVD’s (if equipped) remain energized

• **Cordex™ peripheral support:** Optional add-on’s for individual cell and temperature monitoring and for expanding controller I/O

• **Multi language support:** Including Chinese characters

Battery Management
• **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 estimate:** Based on current battery capacity and system load

• **Battery logging:** Retain up to 40 records of battery statistics and events

• **Dynamic charge current control:** Limits battery recharge current to a fixed value, helps to prevent thermal runaway

• **Temperature compensated float voltage:** Increases voltage with 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

Maintenance
• **Data logger:** Record any system input(s), and set sample rate or 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, outdoor cabinet thermal performance

• **Easy remote software upgrades:** Fail-safe protected upgrades for controllers, rectifiers and peripherals
Advanced Equation Editor
Access all internal controller signals and create custom alarms and signals using Boolean expressions and logical operators. Interface combines ease of use with advanced logic and control capabilities (e.g., Generator cycle charge control).

Custom Signals
Customize remotely via SNMP set commands or via the integrated equation editor. Custom unit of measures available for creating various signal types. Timers and Counters allow for advanced functionality (e.g., Generator cycle counter and runtime).

SNMP communication
For remote alarming and network/fleet management applications. Configure 3rd party network management systems for custom display and graphics using Cordex control alarms and signal values.
Compact controller option for 2RU rectifier and DC/DC converter shelves

Modular, hot swappable design for Cordex 1.8/2.0kW CXRF, 2kW CXDF and LPS shelves

Internet ready and remotely accessible for complete system monitoring and control

Advanced battery monitoring and power save features for OPEX savings

Highly configurable platform with user definable alarms and data logging

Consult your Alpha representative for P/N configurations

Performance / Features

User Interface

GUI: Embedded web based GUI accessed via ethernet using web browser
Display: 4 Segment LCD display for V & I display
Audio: Built in speaker for audible alarm
LED indicators: System OK – Green
Minor alarm: Yellow
Major alarm: Red

Key Features

• Power save (optimizes rectifier efficiency)
• Power on delay start
• Temperature compensation
• Manual, auto & periodic equalize
• Dynamic charge current control
• Battery runtime & capacity indication
• Auto or manual battery test mode
• User configurable alarms and signals
• Languages for english, chinese & 3rd language option
• Downloadable software & firmware upgrades
• Lithium battery backup for real time clock

Communication

Alarm relays: Potential free Form C contacts
SNMP: SNMP v2.5 via ethernet
Email: SMTP via ethernet or modem

Communication Ports

CAN: Interface to Cordex series rectifiers, DC/DC converters and optional smart peripherals
Ethernet: 10/100 Base T with half/full duplex

System I/O

Alarm relays: 4 (3 + 1 internal on some models)*
Voltage inputs: 1 + 1 internal
Temp inputs: 2
Current inputs: 1 (0 + 1 internal on some models)
Digital inputs: 2

Log Files

Daily statistics: Min., max. and average on analogue input channels with date and time stamp
Battery current, rectifier current and AC mains voltage for last 90 days

Event log: All events such as alarms, power on, change of state on digital inputs or other events

Battery log: Battery health history on last 20 discharges with time of discharge and battery capacity.

Data logging: Up to 16 user configurable logs of all system signals including Smart Peripherals

Electrical

Input voltage: 17 to 65Vdc
Current: <100mA @ 48Vdc, <200mA @ 24Vdc

Mechanical

Dimensions: 88H x 26W x 280D

Mounting: Modular option for Cordex™ 2RU series shelves

Environmental

Temperature: -40 to 65°C
Humidity: 0 to 95% RH non-condensing

Related Components

CXCI I/O terminal block extension with 25-pin
D-sub cable for 1.8/2.0kW rectifier shelves: 036-201-20-000

Agency Compliance

Safety: UL/CSA C22.2 No 60950-1
IEC/EN 60950-1
CE marked

EMC: ETSI 300 386

Emissions: CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-tick (Australia)

Immunity: EN 61000-4-2,-3,-4,-5,-6
Modular, hot swappable controller for use with Cordex HP 1.2kW rectifier platform
Internet ready and remotely accessible for complete system monitoring and control
Integrated SNMP functionality for cost effective multiple site monitoring
Advanced battery monitoring and power save features for OPEX savings
Highly configurable platform with user definable alarms and data logging

P/N: 0180030-004 (Horizontal mount)
P/N: 0180030-005 (Vertical mount)

<table>
<thead>
<tr>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input voltage:</strong></td>
</tr>
<tr>
<td><strong>Current:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance / Features</th>
</tr>
</thead>
</table>
| **Display:** | 4 segment LCD for V&I display
** “OK / Major / Minor” 3-color, LED display
Web based GUI via ethernet |

| Communication ports: | RJ45 ethernet port (front) |

<table>
<thead>
<tr>
<th>System I/O:</th>
</tr>
</thead>
</table>
| **Alarm relays:** | 7 (6+1 on some systems)
(3+1 on some systems) |
| **Voltage inputs:** | 1+1 internal |
| **Current inputs:** | 1 (0+1 internal on some systems) |
| **Temperature inputs:** | 2 |
| **Digital inputs:** | 2 |

<table>
<thead>
<tr>
<th>Mechanical</th>
</tr>
</thead>
</table>
| **Mounting:** Modular controller for 1.2kW shelves.
Horizontal and vertical mounting configurations available (consult factory) |

<table>
<thead>
<tr>
<th>Dimensions:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mm:</strong></td>
</tr>
<tr>
<td><strong>inches:</strong></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature:</strong></td>
</tr>
<tr>
<td><strong>Humidity:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agency Compliance</th>
</tr>
</thead>
</table>
| **Safety:** | CSA C22.2 No 60950-1-03
CE marked |
Flexible rack and panel mount controller for use with Cordex™ rectifier and DC/DC converter platforms
Internet ready and remotely accessible for complete system monitoring and control
Integrated SNMP functionality for cost effective multiple site monitoring
Advanced battery monitoring and power save features for OPEX savings
Highly configurable platform with user definable alarms and data logging

Consult your Alpha representative for P/N configurations

Electrical

**Input voltage:** ............... 17 to 65Vdc

Performance / Features

**Display:** .................. LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

**Communication ports:** ... RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
modem port (optional)

**Controller I/O:**
Voltage inputs: ............... 2
Current inputs: ............... 4
Temperature inputs: ........... 2
Digital inputs: ............... 8
BI voltage inputs: ............. 2
Relay outputs: ............... 8 (expandable to 16)

Mechanical

**Mounting:** ............... CXCR with 19" or 23" rack mounting
CXCP panel mount

**Dimensions (excludes mounting brackets):**
mm: .......................... 131H x 431W x 100D
inches: ...................... 5.1H x 16.9W x 3.9D
**Weight:** .................. 6.2kg (13.8lbs)

Environmental

**Temperature:** ............ Extended: ............... -40 to 65°C (-40 to 149°F)
Humidity: ...................... 0 to 95% RH non-condensing

Agency Compliance

**Safety:** ...................... CSA C22.2 No 60950-1-03
CE marked

**EMC:** ....................... ETSI 300 386

**Emissions:** ................. CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

**Immunity:** ................ EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
Flexible rack mount controller for use with 125/220Vdc Cordex™ rectifier platforms
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP and MODBUS TCP/IP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings
- Highly configurable platform with user definable alarms and data logging
- Integrated Ground Fault Detection (GFD) circuit to ensure system safety

Consult your Alpha representative for P/N configurations

**Electrical**

- **Input voltage:** 90 to 300Vdc

**Performance / Features**

- **Display:** LCD touchscreen display (160 x 160 pixels)
- "OK / Major / Minor" 3-color, LED display
- Web based GUI via ethernet

- **Communication ports:** RJ45 ethernet port (front accessible rear port)
- RS232 craft port (front)
- RS232 modem port (optional)

- **Ground Fault Detection:** Built in user adjustable 0-10mA

- **Controller I/O:**
  - Voltage inputs: 1
  - Current inputs: 1 shunt +1 DCCT
  - Temperature inputs: 2
  - Digital inputs: 4
  - Bi voltage inputs: 4
  - Relay outputs: 8

**Mechanical**

- **Mounting:** 19” or 23” rack mounting

- **Dimensions (excludes mounting brackets):**
  - mm: 131H x 431W x 100D
  - inches: 5.1H x 16.9W x 3.9D

- **Weight:** 6.2kg (13.8lbs)

**Environmental**

- **Temperature:**
  - Extended: -40 to 65°C (-40 to 149°F)
  - Humidity: 0 to 95% RH non-condensing

**Agency Compliance**

- **Safety:** CSA C22.2 No 60950-1-03
  - CE marked

- **EMC:** ETSI 300 386

- **Emissions:**
  - CFR47 (FCC) Part 15 Class B
  - ICES-03 Class B
  - EN55022 (CISPR 22) Class B
  - C-Tick (Australia)

- **Immunity:**
  - EN 61000-4-2
  - EN 61000-4-3
  - EN 61000-4-4
  - EN 61000-4-5
  - EN 61000-4-6
Advanced control and monitoring platform for Alpha’s next-generation Cordex product family
High resolution color touchscreen LCD display with advanced local UI
Integrated USB host for local firmware upgrades, configuration updates and system backup/restoration
Comprehensive graphical user interface for advanced system configuration
Seamless integration of multiple energy systems allowing comprehensive management, monitoring and control
External ADIO peripherals for customizing unique I/O configurations
Compact flexible mounting options reduce vertical space requirements

Consult your Alpha representative for P/N configurations

Input voltage: 10 to 60Vdc

User Interface
Local GUI: LCD touch screen display for local access
Display: Full graphic LCD, 480x272 pixels, with backlight and contrast adjustment
Web UI: Embedded web based UI accessed via Ethernet using internet browser (Firefox, Chrome, IE)
Audio: Built in multi-tone speaker
LED indicators: System OK – Green
               Minor – Amber
               Major/Critical - Red

Communication
SNMP: SNMP v3* via Ethernet, Compatible with subscription and discovery services
TCP/IP: IPv4 or IPv6
CAN: 2x Ports for communication to Cordex series power electronics peripherals
Ethernet: 2x Ports front and rear; 10/100 Base T with full/half duplex, Auto MDI/MDI-X
USB: 2x USB 2.0 Ports front and rear

Agency Compliance
Safety: CSA C22.2 No 60950-1
CE Marked
EMC: ETSI 300 386
EN55022 (CISPR 22) Class B
C-Tick
Immunity: EN 61000-4-2/3/4/5/6
NEBS: NEBS Level 3 Certified

Related Components
3U rack mount assembly: 0180046
DIN rail mount kit: 0370190/0370196
Redundant input power module: 0180045

System I/O Peripherals

<table>
<thead>
<tr>
<th>Model</th>
<th>L-ADIO</th>
<th>6i-ADIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>0180039</td>
<td>0180051</td>
</tr>
<tr>
<td>Mechanical</td>
<td>84H x 200W x 30D (mm)</td>
<td>84H x 131W x 30D (mm)</td>
</tr>
<tr>
<td></td>
<td>3.3H x 7.9W x 1.2D (in)</td>
<td>3.3H x 5.2W x 1.2D (in)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.27kg (0.6lb)</td>
<td>0.20kg (0.44lb)</td>
</tr>
<tr>
<td>Voltage inputs</td>
<td>4 BiV (-60 to +60Vdc)</td>
<td></td>
</tr>
<tr>
<td>Shunt inputs</td>
<td>4 (25 to 200mV)</td>
<td>6 (25 to 200mV)</td>
</tr>
<tr>
<td>Temp inputs</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>8</td>
<td></td>
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<tr>
<td>Relay outputs</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Consult your Alpha representative for P/N configurations

Electrical

Performance / Features

User Interface
Local GUI: LCD touch screen display for local access
Display: Full graphic LCD, 480x272 pixels, with backlight and contrast adjustment
Web UI: Embedded web based UI accessed via Ethernet using internet browser (Firefox, Chrome, IE)
Audio: Built in multi-tone speaker
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               Major/Critical - Red

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SNMP: SNMP v3* via Ethernet, Compatible with subscription and discovery services
TCP/IP: IPv4 or IPv6
CAN: 2x Ports for communication to Cordex series power electronics peripherals
Ethernet: 2x Ports front and rear; 10/100 Base T with full/half duplex, Auto MDI/MDI-X
USB: 2x USB 2.0 Ports front and rear

Mechanical
Dimensions:
mm: 83.5H x 153.8W x 46.2D
inches: 3.3H x 6.1W x 1.8D
Weight: 0.45kg (1.0lbs)

Environmental
Temperature: -40 to +65°C
Humidity: 0 to 95% RH non-condensing
## Controllers & Communications

### CORDEX™ CONTROLLER SERIES REFERENCE GUIDE

<table>
<thead>
<tr>
<th>Model</th>
<th>CXC HP</th>
<th>CXCM</th>
<th>CXCM1/CXCM1*</th>
<th>CXCM2</th>
<th>CXCM4</th>
<th>CXCI/CXCI*</th>
<th>CXCR/CXCP</th>
<th>CXCR HV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screen</td>
<td>Color LCD 480 x 272 pixels</td>
<td>Full graphic LCD 160 x 160 pixels</td>
<td>Basic current / Volts display only</td>
<td>Full graphic LCD 160 x 160 pixels</td>
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<tr>
<td><strong>Inputs</strong></td>
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<tr>
<td>Analog</td>
<td>Modular I/O</td>
<td>2V, 2T, 1C, 1BIV</td>
<td>1V, 1C, 2T</td>
<td>1V, 2T, 2C, 4BIV</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Digital</td>
<td>Reference Cordex CXC HP Datasheet</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm relay outputs</td>
<td>8 Form C</td>
<td>4 Form C / 7 Form C(+)</td>
<td>6 Form C</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>83.5H x 153.8W x 46.2D</td>
<td>177H x 74W x 255D</td>
<td>41.4H x 84.4W x 256.8D</td>
<td>86.4H x 128W x 247D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inches</td>
<td>3.3H x 6.1W x 1.8D</td>
<td>6.9H x 2.9W x 10D</td>
<td>1.63H x 33.4W x 10.11D</td>
<td>3.4H x 5W x 9.7D</td>
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</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>CXC M4</th>
<th>CXC1/CXCI*</th>
<th>CXCR/CXCP</th>
<th>CXCR HV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specifications</strong></td>
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<td></td>
<td></td>
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<tr>
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<tr>
<td><strong>Inputs</strong></td>
<td></td>
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</tr>
<tr>
<td>Analog</td>
<td>2V, 2T, 4C, 2BIV</td>
<td>2V, 2T, 4C, 2BIV</td>
<td>1V, 2T, 1C, 4BIV, 1GFI</td>
<td></td>
</tr>
<tr>
<td>Digital</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Alarm relay outputs</td>
<td>8 Form C</td>
<td>4 Form C</td>
<td>8 Form C</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm</td>
<td>177H x 87W x 257D</td>
<td>88H x 28W x 280D</td>
<td>131H x 431W x 100D</td>
<td></td>
</tr>
<tr>
<td>inches</td>
<td>7H x 3.4W x 10.1D</td>
<td>3.5H x 1W x 11D</td>
<td>5.1H x 16.9W x 3.9D</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectifier shelf option availability</th>
<th>CXC HP</th>
<th>CXCM</th>
<th>CXCM1/CXCM1*</th>
<th>CXCM2</th>
<th>CXCM4</th>
<th>CXCI/CXCI*</th>
<th>CXCR/CXCP</th>
<th>CXCR HV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>250W (12Vdc)</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400W (24Vdc)</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>650W (48Vdc)</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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</tr>
<tr>
<td>1kW (48Vdc)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1.2kW (48Vdc)</td>
<td>Yes</td>
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<td></td>
<td></td>
<td>Yes</td>
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<tr>
<td>2.0kW (48Vdc)</td>
<td>Yes</td>
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<td></td>
<td>Yes</td>
<td></td>
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<td></td>
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<tr>
<td>2.4kW (48Vdc)</td>
<td>Yes</td>
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<td>Yes</td>
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<td></td>
</tr>
<tr>
<td>3.1kW (24Vdc)</td>
<td>Yes</td>
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<td></td>
<td>Yes</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.0kW (48Vdc)</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1kW (125/220Vdc)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.4kW (125/220Vdc)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
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</tr>
</tbody>
</table>
Simple and cost effective battery status monitoring solution
24 or 48Vdc universal input
Flexible rack and wall mount installation options
Local and remote indication of pass/fail status

P/N: 747-109-20-040

Electrical

Input voltage: ............... ±20 to 60Vdc

Performance / Features

LEDs:
Green:.......................... Battery cond. OK
Red:.............................. Battery cond. fail

Front panel reset
Rear output Form C relay:.... Battery fail
Front panel switch:............. Adjust volt deviation to max 1.6V in 0.1V increments

Mechanical

Dimensions:
mm:............................ 38.1H x 114.3W x 25.4D
inches:......................... 1.5H x 4.5W x 1D
Mounting:...................... 19” rack mount (4 modules)
23” rack mount (5 modules)
Wall mount (1 modules)

Environmental

Temperature:.................. -40 to +50°C
Humidity:....................... 0 to 95% RH non-condensing
For greater effectiveness, control and communication with your UPS system
The card allows for communication with the Alpha UPS remotely through a web based interface
The card is powered by the UPS batteries eliminating the need for an external power source
Capable of providing notifications to different email addresses
Outgoing notifications can be customized with selectable severity levels and triggered by events, faults and/or alarms
Firmware updates for the UPS or the card itself can be downloaded from our website and uploaded to the device remotely**

The card provides a web based graphical user interface (GUI) designed to help Alpha FXM/Micro UPS users monitor, control and set various parameters. With a computer and a crossover RJ-45 cable, users are able to see UPS parameters, relay configurations, events and warnings through a web browser. It is an excellent maintenance and troubleshooting tool that updates information every 5 seconds and logs 200 events with time and date stamp. The UPS event log can be saved to a PC via RS232 using Alpha UPS Monitor Software.

Get real-time notification of every alarm and fault that occurs so you can respond proactively. Easy to customize, it allows you to set your own notification preferences and receive it on any PC, smartphone or a tablet that can receive email.

* FXM/Micro communication card is optional on some models, check with your Alpha representative for more details
** For units with green LCD one time local update maybe required
Power Modules

Alpha’s power modules are the engines of our power solutions. Our modules convert AC to DC (rectifiers), DC to DC (converters) and DC to AC (inverters). Featuring high power density, high efficiency, and high reliability, the power conversion modules come in various form factors and power ranges to match the unique needs of our customers. Many of the modules operate in high temperatures, making them ideal for harsh environments including outdoor enclosures.

Rectifiers, DC-DC converters and inverter modules are designed to operate seamlessly with the advanced Cordex™ CXC controllers, providing local and remote access to system control and monitoring.

>Rectifiers

Cordex rectifiers range from 250W to 12,000W per module, providing utmost flexibility in power system design. Multiple DC output and AC input options are available to provide the right solution for most telecommunications and utility applications. The hot-swappable, modular rectifiers are controlled and monitored by the Cordex family of controllers, ensuring customer access and management of the modules and the system.

A unique blend of advanced features enables Cordex rectifiers to offer significant operational and capital savings. High power density modules provide users with greater rack space for additional revenue generating equipment in space restricted environments. High efficiency rectifiers reduce power consumption. Fan cooled rectifier options are industry leading in terms of high temperature operation. And the inherent high reliability of the Alpha design ensures a long product life.
CORDEX™ HP 300W

Modular Switched Mode Rectifier

- High performance 300W rectifier provides unique combination of size, efficiency and performance
- Industry leading 95% efficiency for reduced OPEX and carbon footprint
- Compact size yields more space for revenue generating equipment
- Wide range AC input for worldwide installation requirements
- Dual front and back DC outputs allow maximum flexibility
- Wide temperature operating range (-40 to 70°C without power derating) for installation in harsh outdoor and indoor environments

| P/N: 0100010 |

**Electrical**

| Input voltage: | Standard: 90 to 265Vac | Maximum: 300Vac |
| Input frequency: | 47 to 63Hz |
| Power factor: | 99% |
| Input current: | 1.40A @ 230Vac |
| | | 3A @ 110Vac |
| Efficiency: | 95% |
| Output: | Voltage: 43 to 56Vdc |
| | Power: 300W |
| | Current: 5.6A @ -54Vdc |
| Load regulation: | ±0.5% |
| Line regulation: | ±0.2% |
| Wide band noise: | <10mVrms |
| Psophometric noise: | <2mVrms |
| Acoustic noise: | <49dBa |

**Performance / Features**

- LED off - no power available
- Green LED - no failure
- Orange LED - stand by (remote off)
- Red LED - Low DC voltage (<37Vdc)
- Blinking red LED - AC failure, thermal failure or short circuit

**Indicators:**

- Mains out of range (input fuse)
- Output overvoltage
- Output overload
- Short circuit current
- Smart power derating
- Thermal shutdown
- Hot swap

**Measurables:**

- Dimensions: mm: 41.5H (1U) x 86W x 166D |
- inches: 1.6H x 3.4W x 6.5D |
- Weight: 0.57kg (1.2lbs)

**Environmental**

- Temperature: Operating: -40 to 70°C (-4 to 158°F) |
- Storage: -40 to 85°C (-40 to 185°F) |
- Humidity: Operating: 20 to 80% RH non-condensing |
- Storage: 10 to 95% RH non-condensing |
- Elevation: Up to 3000m (9842ft) |
- Cooling: Fan cooled (front to rear)

**Related Components**

- Shelf: Power shelf with 3 rectifier slots, DC distribution and control unit: 0300072 |
- Supervisory: Comp@s communication card: 7400325 |
- Accessories: Blank plate for rectifier slot: 0100010-001

**Agency Compliance**

- Safety: EN60950 |
- CE marked |
- Environment: IEC 60068-2-27 |
- ETSI EN 300 019-1-3 class 3.4 |
- EMC: ETSI EN 300386
CORDEX™ 650W

48Vdc Modular Switched Mode Rectifier

- Available in 13.5A @ 48Vdc
- Universal 120V/208 to 240V single phase AC input
- Power limiting and wide range AC input
- 91% efficiency and power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

120V model P/N: 010-571-20
Universal 120/240 model P/N: 010-570-20

### Electrical

<table>
<thead>
<tr>
<th>Input voltage (120Vac model):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating: .................. 90 to 140Vac (output power 650W)</td>
</tr>
<tr>
<td>Extended: ................... 90 to 70Vac (de-rated output power)</td>
</tr>
<tr>
<td>Power output: ................ 650W at nominal 120Vac</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input voltage (universal 100 to 240Vac model):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating: .................. 176 to 320Vac (output power 650W)</td>
</tr>
<tr>
<td>Extended: ................... 176 to 90Vac (de-rated output power)</td>
</tr>
<tr>
<td>Operating: .................. 100 to 140Vac (output power 500W)</td>
</tr>
<tr>
<td>Power output: ................ 650W at nominal 208 to 240Vac &amp; 500W at nominal 120Vac</td>
</tr>
</tbody>
</table>

| Input frequency: ............ 45 to 70Hz |
| Power factor: ................ >99% |
| THD: ........................ <5% |
| Efficiency: .................. >90% |

| Output: |
| Voltage: ................. 42 to 58Vdc |
| Current: ............... 12A @ 54Vdc (13.5A max) |

| Load regulation:................. Static <±0.5% |
| Dynamic <±1% for 40 to 90% load step |
| 2ms recovery time |

| Line regulation: ............. Static <±0.1% |
| Dynamic <±1% for any change within rated limits |

| Wide band noise: .............. <10mVrms |
| Psophometric noise: ........... <1mV Rms |

### Protection:
- Current limit/short circuit
- Output high voltage shutdown
- Thermal foldback/shutdown
- AC line low voltage shutdown
- AC high voltage shutdown

### Mechanical

| Dimensions: |
| mm: ...................... 88.4H x 71.6W x 242D |
| inches: ................. 3.4H x 2.8W x 9.5D |
| Weight: .................. 1.4kg (3lbs) |

### Environmental

| Temperature: |
| Operation: .................. -40 to 50°C (-40 to 122°F) |
| Storage: .................... -40 to 85°C (-40 to 185°F) |
| Humidity: ................. 0 to 95% RH non-condensing |
| Elevation: .................. -500 to 3000m (-1640 to 9840ft) |
| Heat dissipation: ........... <94 BTU per hour |

### Agency Compliance

| 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
- EN55022 (CISPR 22) Class B
- EN 61000-3-2, 3-3
- ANSI/IEEE C62.41 Cat B3
- ICES-03 Class B
- C-Tick (Australia)
CORDEX™ 1KW

48Vdc Modular Switched Mode Rectifier

Available in 20.8A @ 48Vdc
Power limiting and wide range AC input
92% efficiency and power factor correction
Convection cooled
Hot swappable, 4RU ultra compact design

P/N: 010-566-20

Electrical

Input voltage:
Nominal: ......................208 to 277Vac
Operating: ....................150 to 420Vac
Extended: .....................15 to 90Vac (de-rated power)

Input frequency: ..................45 to 66Hz
Power factor: ....................>0.99
Efficiency: ........................>92%

Power output: ....................1000W continuous/module

Output:
Voltage: ......................42 to 60Vdc
Current: ......................18.5A @ 54Vdc (20.8A max)

Load regulation: ......................<±0.5% (static)
Line regulation: ......................<±0.1% (static)
Transient response: ......................<±1% for 50 to 100% load step, 2ms recovery time

Noise:
Voice band: ......................<32dBrnC
Wide band: ......................<5mVrms
PSophometric: ......................<1mV

Performance / Features

Indicators: ....................AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: .................Natural convection

Adjustments (via CXC Controller):
- Float and equalize voltage
- Battery test voltage
- High and low voltage alarms
- High voltage shutdown
- Current limit
- Start delay timers
- Slope %

Protection:
- Current limit/short circuit
- Input/output fuses
- Output power limiting
- Output high voltage shutdown
- Input transient
- Thermal foldback/shutdown
- AC low line foldback/shutdown

Mechanical

Dimensions:
mm: .........................177H x 71W x 250D
inches: ......................6.9H x 2.8W x 9.8D
Weight: ........................2.9kg (6.4lbs)

Environmental

Temperature:
Operation: ......................-40 to 50°C (-40 to 122°F)
(with short periods up to 70°C/158°F)
Storage: ......................-40 to 85°C (-40 to 185°F)

Humidity: ........................0 to 95% RH non-condensing

Elevation: ......................-500 to 4000m (-1640 to 13120ft)

Heat dissipation: ......................<295 BTU per hour

Agency Compliance

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, 3-3
- ANSI/IEEE C62.41 Cat B3
*CORDEX™ HP 1.2KW*

48Vdc Modular Switched Mode Rectifier

- High performance compact 25A rectifier for 48 telecom application
- 94% efficiency for reduced OPEX and carbon footprint
- Extended temperature range (-40 to 80°C) enabling to deliver full rated output power up to 65°C for installation in harsh outdoor and indoor environments
- 1RU x 2RU footprint for flexible and multiple mounting options
- High power density (21.8W/in³) yields more space for revenue generating equipment

## Adjustments (via CXC Controller):
- Battery test voltage
- High and low voltage alarms
- High voltage shutdown
- Start delay timers

## Protection:
- Current limit/short circuit
- Input/output fuses
- Output power limiting
- Thermal foldback/shutdown
- AC low line foldback/shutdown

### Mechanical

- **Dimensions:**
  - mm: 414 x 84.8 x 256.8
  - inches: 1.63 x 3.34 x 10.1
  - Weight: 1.23kg (2.7lbs)

### Environmental

- **Temperature:**
  - Operating: -40 to 80°C (-40 to 176°F); full rated output up to 65°C (149°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- **Humidity:** 0 to 95% RH non-condensing
- **Elevation:** -500 to 3000m (-1640 to 9840ft)
- **Heat dissipation:** <308 BTU per hour

### Agency Compliance

- **Safety:** CSA C22.2 No 60950-1-03
- **EMC:** ETSI 300 386
- **CE marked**

### Electrical

- **Input voltage:**
  - Nominal: 176 to 276Vac
  - Extended (low): 90 to 175Vac (de-rated output power)
  - Extended (high): 277 to 300Vac (de-rated power factor)
- **Input current:**
  - Nominal: 7.4A max
  - 90 to 132Vac: 6A max
- **Input frequency:** 45 to 70Hz
- **Power factor:** >99%
- **THD:** <5% @ nominal input voltage
- **Efficiency:** 94%
- **Output voltage:** 42 to 58Vdc
- **Output power:**
  - Nominal AC input: 1200W
  - 110 to 132Vac: 600W (de-rated linearly to 491W @ 90Vac)
- **Load regulation:**
  - Static: <±0.5%
  - Dynamic: <±1% for 40 to 90 to 40% load step, 2ms recovery time
- **Line regulation:**
  - Static: <±0.1%
  - Dynamic: <±1% for any change within rated limits
- **Wide band noise:** <30mVrms
- **Psophometric noise:** <150mVp-p
- **Widest noise:** <2mV

### Performance / Features

- **Indicators:** AC mains OK — green LED
  - DC output OK — green LED
  - Module alarm — red LED
- **Cooling:** Fan cooled

- P/N: 010-619-20
CORDEX™ HP 2.0KW

48Vdc Modular Switched Mode Rectifier

- 94% efficiency for reduced operating expenses and carbon footprint
- Available in 41.7A @ 48Vdc
- Universal, wide range AC input
- Hot swappable, 2RU ultra compact design
- Backwards compatible with Cordex 1.8kW shelves and power solutions enabling cost effective system upgrade

P/N: 010-622-20

Electrical

- **Input voltage:**
  - Nominal: 187 to 277Vac
  - Operating: 187 to 312Vac
  - Extended: 187 to 90Vac (de-rated power)
- Power factor: >0.99 (50 to 100% load)
- THD: <5% (@ 208Vac)
- Efficiency: 94.2%
- Output voltage: 42 to 58Vdc
- Output current: 41.7A @ 48Vdc (nominal input)
- Output power: 2000W continuous @ nominal input
- Load regulation: <±0.5% (static)
- Line regulation: <±0.5% (static)
- Transient response: ±2% for 40 to 90% load step
- Noise:
  - Voice band: <38dBmC
  - Wide band: <30mV RMS (10kHz to 10MHz)
  - <150mV pk to pk (10kHz to 100MHz)
- Psophometric: <60dBa @ 1m (3ft), 30°C

Performance / Features

- Indicators:
  - AC mains OK — green LED
  - Module OK — green LED
  - Module fail — red LED
- Controls:
  - CAN interface to CXC
- Adjustments (via CXC Controller):
  - Float and equalize voltage
  - Battery test voltage
  - High and low voltage alarms
  - High voltage shutdown
  - Current limit
  - Start delay timers
  - Slope %

Mechanical

- Dimensions:
  - mm: 86H x 102W x 270D
  - inches: 3.4H x 4.0W x 10.6D
- Weight: 2.3kg (5.1lbs)

Environmental

- Temperature:
  - Standard: -40 to 55°C (-40 to 149°F)
  - Extended: -40 to 75°C (-40 to 167°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- Humidity: 0 to 95% RH non-condensing
- Elevation: -60 to 2000m (-198 to 6600ft)
- Heat dissipation: <549 BTU per hour

Shelves

- Model: 19/23” shelf (4 modules)  23” shelf (5 modules)
- P/N:
  - 030-749-20
  - 030-747-20
- Dimensions:
  - mm: 89H x 438W x 310D  89H x 541W x 310D
  - in: 3.5H x 17.2W x 12.2D  3.5H x 21.3W x 12.2D
- Weight:
  - 8.5kg (19lbs)
  - 10kg (22lbs)
- Mounting:
  - 19” flush or center mount
  - 23” flush or center mount
  - 23” center mount only
- Connections:
  - Input: Terminal blocks
  - Mini-fit connectors (23” only)
  - Output: Bus adapters with ¼” on 1” center holes
  - Chassis ground: ¼” studs on ¼” centers
  - CAN communication: RJ12 offset

Agency Compliance

- Safety:
  - CSA C22.2 No 60950-1-03
  - UL 60950-1 1st edition
  - CE marked
  - IEC/EN 60950-1

- EMC:
  - ETSI 300 386
  - CFR47 (FCC) Part 15 Class B
  - EN55022 (CISPR 22) Class B
  - EN 61000-3-2, 3-3
  - EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
  - ANSI/IEEE C62.41 Cat B3

- NEBS:
  - GR-1089-CORE, GR-63-CORE, GR-3108-CORE
**CORDEX™ HP 2.4KW**

Modular Switched Mode Rectifier

- High performance compact 50A rectifier for 48 telecom application
- High efficiency (96.2%) for reduced OPEX and carbon footprint
- High temperature operating range for installation in non-controlled environments
- Multiple configurations providing 250A or 12kW in a compact 1RU shelf system
- High power density (28W/in^3) yields more space for revenue generating equipment
- Wide AC input operating range for global installation requirements

**P/N: 0100003-001**

<table>
<thead>
<tr>
<th><strong>Input voltage:</strong></th>
<th>120 to 277Vac Nominal:</th>
<th>187 to 310Vac Operating:</th>
<th>90 to 187Vac (de-rated power) Extended:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input frequency:</strong></td>
<td>44 to 66Hz</td>
<td>2400W continuous</td>
<td>(1200W output @ 120Vac Input)</td>
</tr>
<tr>
<td><strong>Power factor:</strong></td>
<td>&gt;0.99 (50 to 100% load) Power factor:</td>
<td>96.2% Efficiency:</td>
<td></td>
</tr>
<tr>
<td><strong>ThD:</strong></td>
<td>&lt;5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output voltage:</strong></td>
<td>44.5A @ 54Vdc (50A max @ 48Vdc)</td>
<td>44 to 58Vdc Output voltage:</td>
<td>(~25A @ 48Vdc at 120Vac Input)</td>
</tr>
<tr>
<td><strong>Load regulation:</strong></td>
<td>&lt;±0.7% (static) Load regulation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Line regulation:</strong></td>
<td>&lt;±0.1% (static)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transmit response:</strong></td>
<td>&lt;3% for 40 to 90% load step</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Noise:</strong></td>
<td>&lt;38dBmC Voice band:</td>
<td>&lt;20mV RMS (10kHz to 10MHz) Wide band:</td>
<td>&lt;150mV pk to pk (10kHz to 100MHz)</td>
</tr>
<tr>
<td><strong>Psophometric noise:</strong></td>
<td>&lt;2mV RMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acoustic:</strong></td>
<td>&lt;60dBa @ 1m (3ft), 30°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mechanical**

<table>
<thead>
<tr>
<th><strong>Dimensions:</strong></th>
<th>41H x 104x 333D mm:</th>
<th>1.6H x 4.1W x 13.1D inches:</th>
<th>1.76kg (3.9lbs) Weight:</th>
</tr>
</thead>
</table>

**Environmental**

| **Temperature:** | -40 to 75°C (-40 to 176°F); full rated output up to 55°C (131°F); >2000W @ 65°C (149°F) Operating: | 40 to 75°C (-40 to 176°F); full rated output up to 55°C (131°F); >2000W @ 65°C (149°F) Storage: | 40 to 85°C (-40 to 185°F) |
| **Humidity:** | 0 to 95% RH non-condensing | |
| **Heat dissipation:** | <500 BTU per hour (worst case) | |

**Agency Compliance**

**Safety:** CSA/UL/IEC/EN 60950-1 CE Marked

**EMC:** ETSI 300 386

**Emissions:**
- CFR47 (FCC) Part 15 Class B
- EN 61000-3-2, 3-3

**Immunity:**
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI / IEEE C62.41 CatB3

**NEBS:** GR-1089-CORE, GR-63-CORE, GR-3108-CORE

**Cordex 48-2.4kW Rectifier Shelves**

- **23in 1RU universal mount 12,000W**
  - P/N: 0300057-001 Rectifiers: 5 x CXRF HP 48-2.4kW Distribution: Bulk power for external distribution
  - Dimensions: mm: 44H x 537W x 420D inches: 1.75H x 21.1W x 16.5D Weight: 5.7kg (12.6lbs)

- **19in 1RU universal mount 9,600W**
  - P/N: 0300040-001 Rectifiers: 4 x CXRF HP 48-2.4kW Distribution: Bulk power for external distribution
  - Dimensions: mm: 44H x 438W x 420D inches: 1.75H x 17.3W x 16.6D Weight: 4.5kg (9.9lbs)

**Communications ports:** CAN: interface to control rectifiers & smart peripherals

**Cordex 48-2.4kW Rectifier Shelves**

- **23in 1RU universal mount 12,000W**
  - P/N: 0300057-001 Rectifiers: 5 x CXRF HP 48-2.4kW Distribution: Bulk power for external distribution
  - Dimensions: mm: 44H x 537W x 420D inches: 1.75H x 21.1W x 16.5D Weight: 5.7kg (12.6lbs)

- **19in 1RU universal mount 9,600W**
  - P/N: 0300040-001 Rectifiers: 4 x CXRF HP 48-2.4kW Distribution: Bulk power for external distribution
  - Dimensions: mm: 44H x 438W x 420D inches: 1.75H x 17.3W x 16.6D Weight: 4.5kg (9.9lbs)
CORDEX™ HP 4.0kW

48Vdc Modular Switched Mode Rectifier

- High performance 83.3A rectifier for 48V telecom applications
- 95.3% efficiency for increased OPEX savings and reduced carbon footprint
- High power density delivering up to 24kW per 23” shelf
- Power limiting and wide range AC input for global installation requirements
- Extended operating temperature range up to 75°C for deployment in the harshest outdoor environments
- Backwards compatibility with Cordex 3.6kW rectifier shelves and power solutions providing cost effective upgrade path

P/N: 010-623-20

Electrical

Input voltage:
- Nominal: 208 to 277Vac
- Operating: 187 to 312Vac
- Extended: 187 to 90Vac (de-rated power)

Input frequency: 45 to 65Hz

Power factor: >0.99 (50 to 100% load)

Efficiency: 95.3%

Output voltage: 42 to 60Vdc

Output power: 4000W continuous

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, <±2% for 5% to 100% load step

Noise:
- Voice band: <38dBmC
- Wide band: <30mV RMS (10kHz to 10MHz)
- Psophometric: <2mV
- Acoustic: <60dBa @ 1m (3ft)

Performance / Features

Indicators: AC mains OK — green LED
Module OK — green LED
Module fail — red LED

Controls: CAN interface to Cordex controllers

Adjustments (via CXC controller):
- Float voltage
- High/low voltage alarm
- Current limit
- Equalize voltage
- Start delay
- Slope
- Protection:
- Current limit/short circuit
- Input/output fuses
- Power limiting
- Start delay
- Input transient
- Output high voltage shutdown
- Thermal foldback/shutdown
- AC low line foldback shutdown

Mechanical

Dimensions:
- mm: 160H x 87W x 300D
- inches: 6.3H x 3.4W x 11.8D

Weight: 3.9kg (8.6lbs)

Environmental

Temperature:
- Operating: -40 to 75°C (-40 to 176°F); full rated output up to 55°C (131°F); >3600W @ 65°C (149°F)
- Storage: -40 to 85°C (-40 to 185°F)

Humidity: 0 to 95% RH non-condensing

Elevation: -500 to 4000m (-1640 to 13120ft)

Heat dissipation: <1150 BTU per hour

Agency Compliance

Safety:
- CSA C22.2 No 60950-1-03
- UL 60950-1
- CE marked
- IEC/EN 60950-1

EMC:
- ETSI 300 386

Emissions:
- CFR47 (FCC) Part 15 Class B
- EN55022 (CISPR 22) Class B
- EN 61000-3-2, 3-3
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI/IEEE C62.41 Cat B3

NEBS:
- GR-1089 CORE, GR-63 CORE, GR-3108-CORE
-48V high capacity rectifier for CO, MSC, Data Center and Cable Headend facilities

Legacy power system upgrade ready, with Cordex controller

95% efficiency for decreased OPEX and reduced carbon footprint

Wide AC input operating range that satisfies a variety of global installation requirements

Environmental

Temperature:
- Standard: -40 to 55°C (-40 to 131°F)
- Extended: -40 to 75°C (-40 to 167°F) (derated power)
- Storage: -40 to 85°C (-40 to 185°F)

Humidity: 0 to 95% RH non-condensing

Elevation: -500 to 4000m (-1640 to 13120ft)

Heat dissipation: <3450 BTU per hour

Shelves

P/N: 030-716-20

> 23" shelf (2 modules)

Dimensions
- mm: 177H x 530W x 389D
- inches: 6.9H x 20.8W x 15.3D

Weight: 14.5kg (32lbs)

Mounting: Fits 23" racks only flush/center mount

Connections
- Input: Box type terminal block
- Output: Bus adapters with ⅜" studs on 1" centers
- Chassis ground: Compression lug
- CAN communication: RJ12 offset

Agency Compliance

Safety:
- CSA C22.2 No 60950-1
- UL 60950-1 1st Edition
- CE marked
- IEC/EN 60950-1

EMC:
- ETSI 300 386

Emissions:
- CFR47 (FCC) Part 15 Class B
- EN55022 (CISPR 22) Class B
- EN 61000-3-12, 3-3

Immunity:
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI/IEEE C62.41 Cat B3

NEBS: GR-1089 CORE, GR-63 CORE
CORDEX™ 400W

24Vdc Modular Switched Mode Rectifier

Available in 14A @ 24Vdc
Universal 120/208 to 240Vac input
High efficiency and power factor correction
Convection cooled
Hot swappable, 2RU ultra compact design

Electrical

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>90 to 320Vac</td>
</tr>
<tr>
<td>Input frequency</td>
<td>45 to 70Hz</td>
</tr>
<tr>
<td>Power factor</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>THD</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt;88%</td>
</tr>
<tr>
<td>Power output</td>
<td>400W (max)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>20 to 29Vdc</td>
</tr>
<tr>
<td>Output current</td>
<td>14A (current limited)</td>
</tr>
<tr>
<td>Load regulation</td>
<td>Static &lt;±0.5% Dynamic &lt;±2% for 40 to 90% load step 2ms recovery time</td>
</tr>
<tr>
<td>Line regulation</td>
<td>Static &lt;±0.1% Dynamic &lt;±1% for any change within rated limits</td>
</tr>
<tr>
<td>Wide band noise</td>
<td>&lt;10mVrms &lt;100mVp-p</td>
</tr>
<tr>
<td>Psophometric noise</td>
<td>&lt;1mV RMS</td>
</tr>
</tbody>
</table>

Performance / Features

Indicators: AC mains OK — green LED Module alarm — red LED

Cooling: Natural convection

Adjustments (via CXC controller):
- Float voltage
- High/low voltage alarm
- Current limit
- Start delay
- Equalize voltage
- High voltage shutdown
- Slope

Protection:
- Current limit/short circuit
- Input/output fuses
- Power limiting
- Input transient
- Start delay
- Output high voltage shutdown
- Thermal foldback/shutdown
- AC low line foldback shutdown

Mechanical

Dimensions:
- mm: 88.4H x 71.6W x 242D
- inches: 3.4H x 2.8W x 9.5D
- Weight: 1.4kg (3lbs)

Environmental

Temperature:
- Operation: -40 to 50°C (-40 to 122°F) (power de-rated up to 70°C/158°F)
- Storage: -40 to 85°C (-40 to 185°F)
- Humidity: 0 to 95% RH non-condensing
- Elevation: -500 to 3000m (-1640 to 9840ft)
- Heat dissipation: <94 BTU per hour

Agency Compliance

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
- EN55022 (CISPR 22) Class B
- EN 61000-3-2, 3-3

Immunity:
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI/IEEE C62.41 Cat B3
- ICES-03 Class B
- C-Tick (Australia)

Available in 14A @ 24Vdc
Universal 120/208 to 240Vac input
High efficiency and power factor correction
Convection cooled
Hot swappable, 2RU ultra compact design
**CORDEX™ 3.1KW**

24Vdc Modular Switched Mode Rectifier

- Available in 130A @ 24Vdc
- High power density, over 18kW per 23" shelf
- Power limiting and wide range AC input
- Compliant with the stringent EMI immunity requirements for power station and substation environments
- High efficiency and power factor correction
- Hot swappable, 4RU ultra compact design

**P/N: 010-572-20**

**Electrical**

**Input voltage:**
- Nominal: 208 to 277Vac
- Operating: 176 to 312Vac
- Extended: 176 to 90Vac (de-rated power)

**Input frequency:** 45 to 70Hz

**Power factor:** >0.99 (50 to 100% load)

**THD:** <5%

**Efficiency:** >90%

**Output voltage:** 21 to 29Vdc

**Output power:** 3100W continuous/module

**Output current:** 115A @ 27Vdc (130A max. 24V)

**Load regulation:** <±0.5% (static)

**Line regulation:** <±0.1% (static)

**Transient response:** ±2% for 50 to 100% load step, 2ms recovery time

**Noise:**
- Voice band: <32dBmC
- Wide band: <30mV RMS (10kHz to 10MHz)
- <150mV pk to pk (10kHz to 100MHz)
- Psophometric: <1.0mV
- Acoustic: <60dBa @ 1m (3ft)

**Performance / Features**

**Indicators:**
- AC mains OK — green LED
- Module OK — green LED
- Module fail — red LED

**Controls:**
- CAN interface to CXC

**Adjustments (via CXC controller):**
- Float voltage
- High/low voltage alarm
- Current limit
- Start delay
- Equalize voltage
- High voltage shutdown
- Slope

**Protection:**
- Current limit/short circuit
- Input/output fuses
- Power limiting
- Input transient
- Start delay
- Output high voltage shutdown
- Thermal foldback/shutdown
- AC low line foldback shutdown

**Mechanical**

**Dimensions:**
- mm: 160H x 87W x 300D
- inches: 6.3H x 3.4W x 11.8D

**Weight:** 4.6kg (10lbs)

**Environmental**

**Temperature:**
- Standard: -40 to 65°C (-40 to 149°F)
- Storage: -40 to 85°C (-40 to 185°F)
- Humidity: 0 to 95% RH non-condensing
- Elevation: -500 to 4000m (-1640 to 13120ft)
- Heat dissipation: <1176 per hour

**Shelves**
- 19" P/N: 030-737-20-040
- 23" P/N: 030-736-20-040

**Agency Compliance**

**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
- EN55022 (CISPR 22) Class B
- EN 61000-3-2, 3-3
- ANSI/IEEE C62.41 Cat B3
- IEC TS 61000-6-5:2001 Electromagnetic compatibility (EMC) Part 6-5_Generic Standards Immunity for power station and substation environments

**NEBS:** GR-1089 CORE, GR-63 CORE
CORDEX™ 250W

12Vdc Modular Switched Mode Rectifier

- Available in 20.8A @ 12Vdc
- Universal 120/208 to 240Vac input
- Power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

P/N: 010-587-20

Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>90 to 320Vac</td>
</tr>
<tr>
<td>Input frequency</td>
<td>45 to 70Hz</td>
</tr>
<tr>
<td>Power factor</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>THD</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Power output</td>
<td>250W</td>
</tr>
<tr>
<td>Output voltage</td>
<td>10.5 to 14.5Vdc</td>
</tr>
<tr>
<td>Output current</td>
<td>18.5A @ 13.5Vdc (20A max)</td>
</tr>
<tr>
<td>Load regulation</td>
<td>±0.5% (static)</td>
</tr>
<tr>
<td>Line regulation</td>
<td>±0.1% (static)</td>
</tr>
<tr>
<td>Transient response</td>
<td>±2% for 50 to 100% load step</td>
</tr>
<tr>
<td></td>
<td>2ms recovery time</td>
</tr>
<tr>
<td>Wide band noise</td>
<td>&lt;30mVrms</td>
</tr>
<tr>
<td>Psophometric noise</td>
<td>&lt;150mVp-p</td>
</tr>
</tbody>
</table>

Performance / Features

- Indicators: AC mains OK — green LED
- Module alarm — red LED
- Cooling: Natural convection

Adjustments (via CXC controller):

- Float voltage
- High/low voltage alarm
- Current limit
- Start delay
- Equalize voltage
- High voltage shutdown
- Slope

Protection:

- Current limit/short circuit
- Input/output fuses
- Power limiting
- Input transient
- Start delay
- Output high voltage shutdown
- Thermal foldback/shutdown
- AC low line foldback shutdown

Mechanical

- Dimensions:
  - mm: 88.4H x 71.6W x 242D
  - inches: 3.4H x 2.8W x 9.5D
- Weight: 1.4kg (3lbs)

Environmental

- Temperature:
  - Operation: -40 to 50°C (-40 to 122°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- Humidity: 0 to 95% RH non-condensing
- Elevation: -500 to 3000m (-1640 to 9840ft)
- Heat dissipation: <94 BTU per hour

Agency Compliance

- 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
  - EN55022 (CISPR 22) Class B
  - EN 61000-3-2, 3-3
- Immunity:
  - EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
  - ANSI/IEEE C62.41 Cat B3
  - ICES-03 Class B
  - C-Tick (Australia)
CORDEX™ 1.1KW
125Vdc Modular Switched Mode Rectifier

- 8.8A output @ 125Vdc
- Power limiting and wide range AC input
- 93% efficiency with power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

**P/N: 010-579-20**

**Electrical**

- **Input voltage:**
  - Nominal: 208 to 277Vac
  - Operating: 176 to 320Vac
  - Extended: 176 to 150Vac (de-rated to 75%)
- **Input frequency:** 45 to 66Hz
- **Power output:** 1100W continuous/module
- **Power factor:** >0.99 (input current)
- **THD:** <5%
- **Efficiency:** >93%
- **Output voltage:** 90 to 180Vdc
- **Output current:** 8.8A @ 125Vdc (11A max)
- **Load regulation:** Static <0.5%
- **Line regulation:** Static <0.1%
- **Transient response:** <0.2% for 50 to 100% load step, 10ms recovery time
- **Wide band noise:** <300mVrms, <150mVp-p
- **Insulation:** 2.5kVac input-earth
  - 3kVac input-output
  - 2kVac output-earth
  - 0.5kVac signals-earth

**Performance / Features**

- **Indicators:** AC mains OK — green LED
  - Module OK — green LED
  - Module alarm — red LED
- **Cooling:** Natural convection

**Mechanical**

- **Dimensions:**
  - mm: 177H x 71W x 250D
  - inches: 6.9H x 2.8W x 9.8D
  - Weight: 2.9kg (6.4lbs)

**Environmental**

- **Temperature:**
  - Operation: -40 to 50°C (-40 to 122°F)
  - Storage: -50 to 85°C (-58 to 185°F)
- **Humidity:** 0 to 95% RH non-condensing
- **Elevation:** -500 to 4000m (-1640 to 13120ft)
- **Heat dissipation:** <282 BTU per hour (max)

**Shelves**

- **P/N: 030-740-20**
  - 19” shelf (6 module)
  - **Dimensions:**
    - mm: 177H x 444W x 303D
    - Weight: 7.3kg (16lbs)
  - **Mounting:**
    - Fits 19” rack flush mount
    - Fits 19” or 23” center mount
  - **Connections:**
    - Input: Terminal blocks for 3 feeds
    - 4 – 6mm² (12 – 10AWG)
    - Output: ¼” studs on ⅝” centers
    - Chassis ground: ¼” stud
    - CAN communication: RJ12 offset

**Agency Compliance**

- **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 A
    - EN55022 (CISPR 22) Class A
    - EN 61000-3-2, 3-3
    - **Immunity:**
      - EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
      - ANSI/IEEE C62.41 Cat B3
Available 5A output @ 220Vdc
Power limiting and wide range AC input
93% efficiency with power factor correction
Compliant with the stringent EMI immunity requirements for power station and substation environments
Hot swappable, convection cooled

Electrical

Input voltage:
- Nominal: 208 to 277Vac
- Operating: 176 to 320Vac
- Extended: 176 to 150Vac (de-rated to 75%)
Input frequency: 45 to 66Hz
Power output: 1100W continuous/module
Power factor: >0.99 (input current)
Efficiency: >93%
THD: <5%

Output voltage: 180 to 320Vdc
Output current: 5A @ 220Vdc (5.5A max)
Load regulation: Static <±0.5%
Line regulation: Static <±0.1%
Transient response: <±2% for 50 to 100% load step, 10ms recovery time
Wide band noise: <30mVrms
Insulation: 2.5kVac input-earth, <150mVp-p, 3kVac input-output, 2kVac output-earth, 0.5kVac signals-earth

Performance / Features

Indicators: AC mains OK — green LED
Module OK — green LED
Module alarm — red LED

Cooling: Natural convection

Mechanical

Dimensions:
- mm: 177H x 71W x 250D
- inches: 6.9H x 2.8W x 9.8D
- Weight: 2.9kg (6.4lbs)

Environmental

Temperature:
- Operation: -40 to 50°C (-40 to 122°F)
- Storage: -50 to 85°C (-58 to 185°F)
- Humidity: 0 to 95% RH non-condensing
- Elevation: -500 to 4000m (-1640 to 13120ft)
- Heat dissipation: <282 BTU per hour (max)

Shelves

>19” shelf (6 module)
Dimensions:
- mm: 177H x 444W x 303D
- inches: 6.9H x 17.5W x 11.9D
- Weight: 7.3kg (16lbs)

Connections:
- Input: Terminal blocks for 3 feeds 4–6mm2 (12–10AWG)
- Output: ¼” studs on ½” centers
- Chassis ground: ¼” stud
- CAN communication: RJ12 offset

Agency Compliance

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 A
- EN55022 (CISPR 22) Class A
- EN 61000-3-2, 3-3
- Immunity:
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI/IEEE C62.41 Cat B3
- IEC TS 61000-6-5:2001 Electromagnetic compatibility (EMC) Part 6-5_Generic Standards Immunity for power station and substation environments
CORDEX™ 4.4KW
Modular Switched Mode Rectifier

- Available in 35A @ 125Vdc or 20A @ 220Vdc
- High power density, 22kW per 19" shelf
- Compliant with the stringent EMI immunity requirements for power station and substation environments
- 92% efficiency and power factor correction
- Hot swappable, power limiting and wide range AC input

**Electrical**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input voltage:</strong></td>
<td></td>
</tr>
<tr>
<td>Nominal</td>
<td>208 to 240Vac</td>
</tr>
<tr>
<td>Operating</td>
<td>187 to 312Vac</td>
</tr>
<tr>
<td>Extended</td>
<td>187 to 90Vac (de-rated)</td>
</tr>
<tr>
<td><strong>Input frequency:</strong></td>
<td>45 to 70Hz</td>
</tr>
<tr>
<td><strong>Power:</strong></td>
<td>4400W continuous/module</td>
</tr>
<tr>
<td><strong>Power factor:</strong></td>
<td>&gt;0.99 (50 to 100% load)</td>
</tr>
<tr>
<td><strong>THD:</strong></td>
<td>&lt;5%</td>
</tr>
<tr>
<td><strong>Efficiency:</strong></td>
<td>&gt;92%</td>
</tr>
</tbody>
</table>

**Output voltage:**

- 125V module: 90 to 160Vdc
- 220V module: 180 to 320Vdc

**Output current:**

- 125Vdc module: 35A @ 125Vdc (40A @ 110Vdc max)
- 220Vdc module: 20A @ 220Vdc

**Load regulation:**

- Static: <0.5%

**Line regulation:**

- Static: <0.1%

**Transient response:**

- <5% for 40 to 90% load step, 30ms recovery time

**Wide band noise:**

- 220Vdc module: <300mVrms
- <300mVp-p
- 125Vdc module: <90mVrms
- <700mVp-p

**Insulation:**

- 2.5kVac input-earth
- 3kVac input-output
- 2kVac output-earth
- 0.5kVac signals-earth

**Acoustic:**

- <60dBa @ 1m (3ft)

**Performance / Features**

**Indicators:**
- AC mains OK — green LED
- Module OK — green LED
- Module fail — red LED

**Controls:**
- CAN interface to CXC

**Mechanical**

**Dimensions:**

- 125V module: 160H x 87W x 300D
- 220V module: 177H x 442W x 389D
- Weight: 4.65kg (10.57lbs)

**Shelves**

- 125V 19” 5-module P/N: 030-769-20
- 220V 19” 5-module P/N: 030-768-20

**Dimensions:**

- 125V module: 6.3H x 3.4W x 11.8D
- Weight: 8.5kg (19lbs)

**Connections:**

- Input: Box type terminal block
- Output: Bus adapters with ⅜" studs on 1" centers
- Chassis ground: Compression lug
- CAN communication: RJ12 offset

**Agency Compliance**

**Safety:**
- CSA C22.2 No 60950-1-03
- UL 60950-1 1st edition
- CE marked

**EMC:**
- IEC/EN 60950-1

**Emissions:**
- CFR47 (FCC) Part 15 Class A
- EN55022 (CISPR 22) Class A
- EN 61000-3-2, 3-3

**Immunity:**
- EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-11
- ANSI/IEEE C62.41 Cat B3
- IEC 61000-6-5:2001 Electromagnetic compatibility (EMC) Part 6-5_Generic Standards Immunity for power station and substation environments
Converters

Alpha Cordex modular, hot swappable DC-DC converters are the ideal solution for providing dual voltage capability in new systems – or upgrades to existing DC plants for a variety of applications.

Modular 24V-48V and 48V-24V converters meet the needs of wireless carriers that are transitioning radio technologies. Alpha’s DC power solutions include the ability to incorporate Cordex converters into the same system. For existing sites with established DC power plants, the Alpha converters can be configured into a stand-alone shelf for powering the electronic equipment.

Whether supporting legacy cellular equipment or enhancing a network with advanced radio overlays, Alpha Cordex converters provide flexibility that allows you to maintain a single voltage battery system.
Cordex™ Series DC-DC Converters

> Support small to medium 48Vdc loads from legacy 24V power systems
> High power density modular design, up to 2kW output per module
> Advanced monitoring and control capability including remote accessibility
> Internal low voltage shutdown for cost effective integration into existing systems

### Electrical

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>CXDF 24-48/2kW</th>
<th>CXDF 48-24/2kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>21 to 30Vdc</td>
<td>-42 to -60Vdc</td>
<td></td>
</tr>
<tr>
<td>Input current</td>
<td>Up to 94A @ 24V</td>
<td>&lt;48A @ 48V (55A max)</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt;88%</td>
<td>&gt;88% (50 to 100% load)</td>
<td></td>
</tr>
<tr>
<td>Input noise</td>
<td>&lt;32dBmC</td>
<td>&lt;32dBmC</td>
<td></td>
</tr>
<tr>
<td>Voice band</td>
<td>&lt;10mVRMS to 10MHz</td>
<td>&lt;10mVRMS to 10MHz</td>
<td></td>
</tr>
<tr>
<td>Wide band</td>
<td>&lt;150mVp-p to 100MHz</td>
<td>&lt;150mVp-p to 100MHz</td>
<td></td>
</tr>
<tr>
<td>Output power</td>
<td>2000W max @ -54V</td>
<td>2000W max @ 27Vdc</td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>-54Vdc nominal</td>
<td>27Vdc nominal</td>
<td></td>
</tr>
<tr>
<td>Output current</td>
<td>37A max</td>
<td>74A max @ 27Vdc</td>
<td></td>
</tr>
<tr>
<td>Regulation</td>
<td>-1% ±0.1% load (static) ±0.1% line (static)</td>
<td>-1% ±0.1% load (static) ±0.1% line (static)</td>
<td></td>
</tr>
<tr>
<td>Output noise</td>
<td>&lt;38dBmC</td>
<td>&lt;38dBmC</td>
<td></td>
</tr>
<tr>
<td>Voice band</td>
<td>&lt;10mVRMS to 10MHz</td>
<td>&lt;20mVRMS to 10MHz</td>
<td></td>
</tr>
<tr>
<td>Wide band</td>
<td>&lt;150mVp-p to 100MHz</td>
<td>&lt;150mVp-p to 100MHz</td>
<td></td>
</tr>
<tr>
<td>Acoustic noise</td>
<td>&lt;60dBa @ 1m (3ft)</td>
<td>&lt;60dBa @ 1m (3ft)</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th>Dimensions:</th>
<th>mm: 84H x 100W x 235D</th>
<th>inches: 3.3H x 3.94W x 9.25D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight:</td>
<td>2.8kg (6.2lbs)</td>
<td></td>
</tr>
<tr>
<td>Temperature:</td>
<td>-40 to 55°C (de-rated power up to 75°C)</td>
<td></td>
</tr>
<tr>
<td>Humidity:</td>
<td>0 to 95% NC</td>
<td></td>
</tr>
</tbody>
</table>

### Shelves

<table>
<thead>
<tr>
<th>24-48V 5-Mod 23” shelf (single input) P/N: 030-900-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
</tr>
<tr>
<td>mm: 89H x 584W x 304D</td>
</tr>
<tr>
<td>inches: 3.5H x 23.0W x 12.0D</td>
</tr>
<tr>
<td>Weight:</td>
</tr>
<tr>
<td>10.4kg (23.0lbs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>24-48V 4-Mod 19” shelf (dual input) P/N: 030-839-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
</tr>
<tr>
<td>mm: 89H x 438W x 310D</td>
</tr>
<tr>
<td>inches: 3.5H x 17.2W x 12.2D</td>
</tr>
<tr>
<td>Weight:</td>
</tr>
<tr>
<td>8.5kg (19lbs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>48-24V 4-Mod 19/23” shelf P/N: 030-840-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions:</td>
</tr>
<tr>
<td>mm: 88.4H x 438W x 332D</td>
</tr>
<tr>
<td>inches: 3.48H x 17.2W x 13.1D</td>
</tr>
<tr>
<td>Weight:</td>
</tr>
<tr>
<td>8.6kg (18.9lbs)</td>
</tr>
</tbody>
</table>

### Agency Compliance

<table>
<thead>
<tr>
<th>Safety:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA/UL C22.2 60950 (NRTL)</td>
</tr>
<tr>
<td>CE IEC/EN 60950</td>
</tr>
<tr>
<td>CE marked</td>
</tr>
<tr>
<td>EMI:</td>
</tr>
<tr>
<td>Class A radiated</td>
</tr>
<tr>
<td>Class A conducted</td>
</tr>
<tr>
<td>EN 6100-4-2, -3, -4, -6</td>
</tr>
<tr>
<td>GR-1089 (where applicable)</td>
</tr>
<tr>
<td>GR-63</td>
</tr>
</tbody>
</table>

### Related Components

<table>
<thead>
<tr>
<th>External Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>747-599-20-000: Kydex cover kit, 23” CXDF shelf</td>
</tr>
<tr>
<td>747-587-20-000: Kydex cover kit, 19” CXDF shelf</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance / Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN bus communication to remote CXC controllers/periipherals</td>
</tr>
<tr>
<td>Optional integrated CXCI+ controller</td>
</tr>
</tbody>
</table>

### Environmental

| Temperature:       | -40 to 55°C (de-rated power up to 75°C) |
| Humidity:          | 0 to 95% NC                               |
CXDF 380-48/2KW

Cordex™ Series DC-DC Converters

- DC-DC converter supplying 48Vdc output flow from a 380Vdc source
- High power density modular design, up to 2kW output per module
- Advanced monitoring and control capability including remote accessibility
- Hot swappable, 2RU compact design

P/N: 0120034-001

Electrical

**Input voltage:** 380Vdc (nominal)
**Input voltage range:** <260 to 400Vdc (operating)
**Efficiency:** >94.3% (40 to 80% load)

**Input noise:**
- Voice band: <32dBmC
- Wide band: <10mV RMS to 10MHz
- <150mVp-p to 100MHz

**Output power:** 2000W max nominal I/P
**Output voltage:** 57Vdc (default)
**Output voltage range:** 48-59Vdc (set by software)
**Output current:** 41.7A @ 48Vdc (nominal I/P)
**Regulation:** -1% ±0.1% load (static)
- ±0.1% line (static)

**Output noise:**
- Voice band: <38dBmC
- Wide band: <20mV RMS to 10MHz
- <150mVp-p to 100MHz

**Acoustic noise:** <60dBa @ 1m (3ft)

**Indicators:**
- Input ok LED (green)
- Output ok LED (green)
- Module fail LED (red)

**Adjustments:** Via Cordex controller

Mechanical

**Dimensions:**
- mm: 86H x 102W x 270D
- inches: 3.4H x 40W x 10.6D
- Weight: 2.3kg (5.1lbs)

Environmental

**Temperature:** -40 to 55°C (de-rated power up to 75°C)
**Humidity:** 0 to 95% NC

Shelves

380-57V 4-Mod 19/23” shelf P/N: 0300168-001

**Dimensions:**
- mm: 88.4H x 438W x 332D
- inches: 3.48H x 17.2W x 13.1D
- Weight: 8.6kg (18.9lbs)

Performance / Features

CAN bus communication to remote Cordex controllers/peripherals
Optional integrated CXCI+ controller

Agency Compliance

**Safety:** CSA/UL C22.2 60950 (NRTL)
- CE IEC/EN 60950
**EMI:**
- Class A conducted
- Class A conducted
- EN 6100-4-2, -3, -4, -6
Inverters

Alpha’s -48Vdc inverter modules (AIM) and stand-alone inverters are ideal means of supplying AC power in a battery backup environment. The modules offer high reliability, high power efficiency and optimal power density. AIM2500, AIM1500 and INEX 1500 are hot swappable modules installed in AMPS80 HP, AMPS24 HP and INEX inverter systems, respectively. The INVERTER 2000 is a stand-alone inverter.
Offers 94% efficiency and Telecom-grade reliability
Hot swappable 2.5kVA/2kW AC power module allows optimal scalability and flexibility
No single point of failure due to system static switch, as each module has DSP controlled static switch functionality
Up to 4 high power density modules per inverter shelf
Up to 30 modules per 75kVA AMPS80 HP system

P/N: 014-201-20

Electrical

**AC Output:**
- Power rating: 2500VA/2000W
- Waveform: Pure sine wave
- Efficiency: 94% AC-to-AC mode
- Power factor: 0.8
- Transfer time: Zero transfer time
- Nominal voltage: 120Vac
- Voltage accuracy: ±2%
- Frequency: 60Hz (same as input frequency)
- Frequency accuracy: 0.03%
- THD (resistive load): <1.5%
- Transient load recovery time: 0.4 ms
- Soft start time: 20s
- Max crest factor at nominal power: 3.5
- Short circuit overload capacity: 10 x In for 20msec (AC-to-AC mode)
- Short term overload capacity: 150% for 5 seconds
- Permanent overload capacity: 110%
- MTBF: >230,000hrs

**AC Input:**
- Nominal AC voltage: 120Vac
- AC voltage range: 90 - 140Vac
- Input power factor: >99%
- Synchronization range: 57 - 63Hz

**DC Input:**
- Nominal DC voltage: 48Vdc
- Maximum DC voltage range (max): 40 - 60Vdc (user adjustable)
- Voltage ripple: <2mV/38 dBmrc

Mechanical

- Dimensions:
  - mm: 88.9H x 102W x 435D
  - inches: 3.5H x 4W x 17.13D
  - Weight: 5kg (11lbs)

Environmental

- Temperature:
  - Operating: -20 to 40°C (-4 to 104°F)
  - Storage: -40 to 70°C (-40 to 158°F)
- Relative humidity: Up to 95%, non-condensing
- Operating altitude: Up to 1500m (4900ft) above sea level
- Heat Dissipation: 437BTU per hour in AC-to-AC mode; 758BTU per hour in DC-to-AC mode

Agency Compliance

- Safety: UL 60950
- Immunity: EN 61000-4
- Emissions: EN 55022 (Class A)
- RoHS: Compliant
ALPHA INVERTER
MODULE 1500

For installation in AMPS24 HP Systems

> Offers 93% efficiency and Telecom-grade reliability
> Hot swappable 1.5kVA/1.2kW AC power module allows optimal scalability and flexibility
> No single point of failure due to system static switch, as each module has DSP controlled static switch functionality
> Up to 4 high power density modules per inverter shelf
> Up to 16 modules per 24kVA AMPS24 HP system

P/N: 0140004

Electrical

AC Output:
- Power rating: 1500VA/1200W
- Waveform: Pure sine wave
- Efficiency: 93% AC-to-AC mode
- Power factor: 0.8
- Transfer time: Zero transfer time
- Nominal voltage: 120Vac
- Voltage accuracy: ±2%
- Frequency: 60Hz (same as input frequency)
- Frequency accuracy: 0.03%
- THD (resistive load): <1.5%
- Transient load recovery time: 0.4 ms
- Soft start time: 20s
- Maxcrest factor at nominal power: 3.5
- Short circuit overload capacity: 10 x In for 20msec (AC-to-AC mode)
- Short term overload capacity: 150% for 5 seconds
- Permanent overload capacity: 110%
- MTBF: >230,000hrs

AC Input:
- Nominal AC voltage: 120Vac
- AC voltage range: 90 - 140Vac
- Input power factor: >99%
- Synchronization range: 57 - 63Hz

DC Input:
- Nominal DC voltage: 48Vdc
- Maximum DC voltage range (max): 40 - 60Vdc (user adjustable)
- Voltage ripple: <2mV/38 dbm

Mechanical

Dimensions:
- mm: 88.9H x 102W x 300D
- inches: 3.5H x 4W x 12.5D
- Weight: 2.4kg (5.3lbs)

Environmental

Temperature:
- Operating: -20 to 50°C (-4 to 122°F)
- Storage: -40 to 70°C (-40 to 158°F)
- Relative humidity: Up to 95%, non-condensing
- Operating altitude: Up to 1500m (4900ft) above sea level
- Heat Dissipation: 286BTU per hour in AC-to-AC mode; 410BTU per hour in DC-to-AC mode

Agency Compliance

Safety: UL 60950
Immunity: EN 61000-4
Emissions: EN 55022 (Class A)
RoHS: Compliant
INEX 1000 & 1500

For installation in INEX Systems

- Pure sine wave
- Hot swappable replacement in shelf
- Operating efficiency >88%
- DSP design for higher system reliability
- Smart fan speed control
- N+1 redundancy system, load sharing difference <5%
- High power density
- Wide operation temperature range, -20 to 70°C (-4 to 158°F)

120Vac, 1500VA P/N: 014-114-10 / 1000VA P/N: 014-114-10
230Vac, 1500VA P/N: 014-115-10 / 1000VA P/N: 014-115-10

Electrical

AC output:
- Power rating: 1500VA/1200W or 1000VA/800W
- Waveform: Pure sine wave
- Power factor: 0.8
- Nominal output voltage: 110/115/120Vac
- Voltage variation: Max ±2%
- Output frequency: 50/60Hz
- Crest factor: 3:1
- THD: <3%, linear load
- Efficiency: Min 88%
- Isolation AC-enclosure: Basic isolation (Pri-Gnd) 2121Vdc/1min
- Dynamic response: <±10%
- Over load protection: 1.5*Inom >20s
- 1.25*Inom temperature controlled

DC input:
- Nominal voltage: 48Vdc
- Operating range: 40.5Vdc – 58Vdc
- Input protection: Reverse polarity protection
- Psophometric noise voltage: ≤1.0mV ITU-T O.41 (16.66–6000Hz)

Mechanical

- Dimension: mm: 270D x 215W x 43.8H
  inches: 10.63D x 8.46W x 1.72H
- Weight: 3.0kg (6.61lbs)

Environmental

- Temperature:
  - Operating: -20 to 70°C (-4 to 158°F)
  - Storage: -40 to 85°C (-40 to 185°F)
- Humidity: 90% RH non-condensing
- Audible noise: 55dB

Agency Compliance

- Safety: EN 60950-1
  UL 60950-1
  IEC 60950-1
  CSA C22.2 No. 60950-1

- EMC: EN 55022:1998

- Certifications: UL, CE
- RoHS: Compliant
**Powerful 2000VA/2000W stand-alone module**

**High quality pure sine wave output**

**Remarkable overload capability:** 120% overload continuously, 200% overload for up to 5 seconds

**Operating efficiency** up to 91%

**Built-in auto transfer switch (ATS) for increased reliability**

**LCD display for real time status monitoring and setting module parameters**

---

**Mechanical**

**Dimensions:**
- mm: 43.8H x 440W x 360D
- inches: 1.72H x 17.3W x 14.2D
- Weight: 7.1kg (15.7lbs)

**Environmental**

**Temperature:**
- Operation: -20 to 50°C full performance, operating -20 to 60°C
- Storage: -30 to 80°C

**Humidity:**
- 95% relative humidity (non-condensing)

**Altitude:**
- 1500m (4920ft)

**Heat dissipation:**
- Forced cooling with smart control

**Audible noise:**
- 55dB ETS 300 753, class 3.1

---

**Communication Interface**

**Signals/Controls:**
- Control: Keypad to setting all output values and parameters
- Display: LCD and 3-LED’s display alarms and system parameters
- General alarm signal: Dry relay contact
- Remote On/Off: Remote On/Off switch
- PC communications: USB port

---

**Agency Compliance**

**EMC:** EN300 386:2001, Class B compliance

**Safety compliance:** Comply with EN 60950-1/UL 60950-1

**Certification:** CE/UL/C-Tick

**RoHS:** Compliant

**MTBF:** >200,000 hrs as per Telcordia SR-232
Distribution

Alpha offers a wide assortment of breaker and fuse panels for distributing power to critical loads. Panels are available in various sizes and output voltages, and use industry-standard breakers and fuses. The panels can be engineered into Alpha Technologies systems, or offered as standalone products.

Multiple loose panel options are available for either expanding existing site distribution requirements, or for developing custom power systems for your specific requirements. Panels are available with several options including front access, ground bars, integrated shunts and LVD's.

Alpha supplies a variety of universal distribution centers (UDC's) that accommodate system control, distribution and battery connections, all in a single rack mount unit. Further integration with a Cordex™ rectifier system creates a comprehensive power solution in a very compact package; easily configured to practically any power distribution requirement.
BDFB 8X800A

Secondary Distribution System

- Secondary distribution solution for Cell Site, CO, MSC, Data Center and Cable Headend facilities
- Total system capacity exceeding 5000A (continuous rating)
- Flexible dual, quad, 6 or 8 feed options with a maximum rating of 640A per feed
- Each panel consists of 20 secondary load positions
- Flexible circuit breaker and TPS fuse options
- Options for internal and external return

Consult your Alpha representative for P/N configurations

Environmental

Temperature: 0 to 40°C (32 to 122°F)
Humidity: 0 to 95% RH non-condensing
Elevation: -500 to 2800m (-1640 to 9186ft)

System Level Alarm & Control

- Local monitoring of voltage per panel
- Local monitoring of current for panels with shunts
- Bay level breaker/fuse trip lamp indicator
- Individual panel "Power" indicator
- Individual panel breaker trip indicator
- Alarm Relay (dry contacts)
  - Overcurrent alarm on any panel
  - Loss of input feed alarm
  - Fuse/breaker trip alarm
- Alarm connections: 1.5mm² (16 to 30AWG)

Options

- 2' and 4½' cabinet extension
- Cabinet top covers for bottom feed applications
- Seismic anchors and washers kit
- Isolation pad and bushing kit

Agency Compliance

Safety: CSA C22.2 No. 609050-1-03
NEBS: Level 3 certification (pending)
CXDS-M MICRO
CXDS-M MINI

Distribution Systems

- Modular distribution solution for Cell Site, CO, MSC, Data Center and Cable Headend facilities
- Flexible dual feed options with a maximum rating of 1200A per feed
- Compact front access design reduces floor and rack space footprint
- Flexible circuit breaker and TPS fuse options ensuring a solution for all requirements
- Remote access, monitoring and data logging via optional Cordex™ controller simplifies planning and maintenance

Consult your Alpha representative for P/N configurations

Electrical

System voltage: ..............-24V, +24V and -48V
Dual input: ..................1200A x2 max (common return)
Dual input: ..................600A x2 max (split return)

Distribution and Termination

The Micro distribution system consists of a single module; the mini distribution system consists of two modules.

Each module contains 2 banks of 12 plug-in bullet positions.

Module ratings (continuous):
Plug in bullet positions: ..600A per bank

Fuses:
GMT: ..........................10 positions, up to 10A (max.)
TLS/TPS plug-in bullet:
  • Mini: ......................48 positions, up to 100A (max.)
  • Micro: ......................24 positions, up to 100A (max.)

Breakers:
AM plug-in bullet:
  • Mini: ......................48 positions, up to 100A per pole (max.)
  • Micro: ......................24 positions, up to 100A per pole (max.)

Output termination:
GMT Fuse: ..............0.34 to 2.5mm² (14 to 22AWG)
TLS/TPS/AM breaker:....1 pole and 2 pole are ¼” dia. on ⅛” centers
                      3 pole are ⅜” dia. on ⅛” centers

Internal ground bar:.....¼” dia. on ⅛” centers
DC Input: .................3 sets ⅛” dia. on 1” centers per polarity per feed

Mechanical

Mounting: ......................Standard flush or center mount 19” or 23” relay rack mounting options

23” dimensions (1 module):
mm: ............................263H x 660W x 482D
inches: ........................10.5H x 26W x 19D

19” dimensions (1 module):
mm: ............................263H x 550W x 482D
inches: ........................10.5H x 22W x 19D

Weight (1 module): ........27.2kg (60lbs) approx

Environmental

Temperature: ..............0 to 50°C (32 to 122°F)
Humidity: .....................0 to 95% RH non-condensing
Elevation: .....................-500 to 2800m (-1640 to 9186ft)

System Level Alarms and Controls (optional)

Alarms/control parameters are user-programmable through built-in digital supervisory unit.

Indicators: ...............LCD with touch screen
             System OK (green LED)
             System minor alarm (yellow LED)
             System major alarm (red LED)

Alarm connections: .......0.34 to 2.5mm² (14 to 22AWG)

Related Components

Plug In Bullet TPS/TLS Fuse Holder 1-125A: ........520-059-10

Agency Compliance

Safety: ......................CSA C22.2 No. 609050-1-03
            NEBS level 3 certification
## Remote Distribution Panel

- High density remote distribution panel for Telecom CO's, MSC's, Data Center and Cable Headend facilities
- Industry leading system density
- High breaker density - 11x plug-in bullet breakers or TPS/TLS fuses per bus (22 position per 19” panel)
- High current density - Each bus is rated for a maximum amperage of 600A
- 'Split bus' design provides redundant input feeds to network equipment
- 2RU height recovers space in network bays for revenue generating equipment

### Nominal Specifications

<table>
<thead>
<tr>
<th>Panel Part Number</th>
<th>0917001-001</th>
<th>0917001-002</th>
<th>0917001-003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>±24V (or) ±48V</td>
<td>±24V (or) ±48V</td>
<td>±24V (or) ±48V</td>
</tr>
<tr>
<td>Bus Capacity</td>
<td>600A per Bus</td>
<td>600A per Bus</td>
<td>600A per Bus</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>3.5'H x 19&quot;W x 12&quot;D</td>
<td>3.5'H x 19&quot;W x 12&quot;D</td>
<td>3.5'H x 19&quot;W x 12&quot;D</td>
</tr>
<tr>
<td>Mounting</td>
<td>Flush/Center</td>
<td>Flush/Center</td>
<td>Flush/Center</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connections</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input (Hot and Return)</td>
<td>¼&quot; Holes on 1&quot; Center*</td>
<td>¼&quot; Holes on 1&quot; Center*</td>
<td>¼&quot; Holes on 1&quot; Center*</td>
</tr>
<tr>
<td>Positions</td>
<td>11x sets load breakers per bus (22 positions per panel)</td>
<td>11x sets load breakers per bus (22 positions per panel)</td>
<td>11x sets load breakers per bus (22 positions per panel)</td>
</tr>
<tr>
<td>Output (Hot and Return)</td>
<td>22x sets of ¼&quot; studs on ¾&quot; Centers</td>
<td>22x sets of ¼&quot; studs on ¾&quot; Centers</td>
<td>22x sets of ¼&quot; studs on ¾&quot; Centers</td>
</tr>
<tr>
<td>Double Pole: ¾&quot; Studs on 1&quot; Centers**</td>
<td>Double Pole: ¾&quot; Studs on 1&quot; Centers**</td>
<td>Double Pole: ¾&quot; Studs on 1&quot; Centers**</td>
<td></td>
</tr>
<tr>
<td>Triple Pole: ¾&quot; Studs on 1&quot; Centers***</td>
<td>Triple Pole: ¾&quot; Studs on 1&quot; Centers***</td>
<td>Triple Pole: ¾&quot; Studs on 1&quot; Centers***</td>
<td></td>
</tr>
<tr>
<td>Chassis ground</td>
<td>¼&quot; studs on ¾&quot; Center</td>
<td>¼&quot; studs on ¾&quot; Center</td>
<td>¼&quot; studs on ¾&quot; Center</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarms</td>
<td>Breaker/Fuse trip: Form C contacts</td>
<td>Breaker/Fuse trip: Form C contacts</td>
<td>Breaker/Fuse trip: Form C contacts</td>
</tr>
<tr>
<td>Monitor</td>
<td>Breaker/Fuse trip via Form C Contacts</td>
<td>Breaker/Fuse trip and bus voltages via CAN bus to CXC-HP controller</td>
<td>Breaker/Fuse trip and bus voltages on CXC-HP controller (IP/SNMP)</td>
</tr>
<tr>
<td>LED indicators</td>
<td>System Ok (Green)</td>
<td>System Ok (Green)</td>
<td>System Ok (Green)</td>
</tr>
<tr>
<td></td>
<td>Breaker/Fuse Trip (Red)</td>
<td>Breaker/Fuse Trip (Red)</td>
<td>Breaker/Fuse Trip (Red)</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0 to 40°C (0 to 104°F)</td>
<td>0 to 40°C (0 to 104°F)</td>
<td>0 to 40°C (0 to 104°F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0-95% non-condensing</td>
<td>0-95% non-condensing</td>
<td>0-95% non-condensing</td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>CSA C22.2 No. 609050-1-03</td>
<td>CSA C22.2 No. 609050-1-03</td>
<td>CSA C22.2 No. 609050-1-03</td>
</tr>
</tbody>
</table>

* Can accept upto 2x 750 MCM cables (back to back) on hot and return connections - For vertical input connections order kit # 038xxx-001
** For double pole breakers order adapter kit #
*** For triple pole breakers order adapter kit #
-48V, 400A distribution panel with front access distribution
- High breaker density - 26 breakers in 3RU
- High temperature rated design for harsh outdoor installations

### Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>19” CXDM-E3</th>
<th>23” CXDM-E3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel Voltage</td>
<td>±48V (OR) ±24V</td>
<td>±48V (OR) ±24V</td>
</tr>
<tr>
<td>System Capacity (Max)</td>
<td>400A</td>
<td>400A</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 to 65°C (-40 to 149°F)</td>
<td>-40 to 65°C (-40 to 149°F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 95% RH non-condensing</td>
<td>0 to 95% RH non-condensing</td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>Flush/Center</td>
<td>Flush/Center</td>
</tr>
<tr>
<td>Dimensions</td>
<td>5.25”H x 19”W x 11.3”D</td>
<td>5.25”H x 23”W x 11.3”D</td>
</tr>
<tr>
<td>Weight (System)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DC Connections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input connections</td>
<td>⅜” Holes on 1” Center*</td>
<td>⅜” Holes on 1” Center*</td>
</tr>
<tr>
<td>Hot Positions</td>
<td>21x Load Brkers</td>
<td>26x Load Brkers</td>
</tr>
<tr>
<td>Return Positions</td>
<td>21x sets of ¼” Studs on ⅝” Centers</td>
<td>26x sets of ¼” Studs on ⅝” Centers</td>
</tr>
<tr>
<td>System Access</td>
<td>Front Access</td>
<td>Front Access</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td>Monitor via discrete signals to externally mounted Alpha controller (0916020-001)</td>
<td>Monitor via discrete signals to externally mounted Alpha controller (0916021-001)</td>
</tr>
<tr>
<td></td>
<td>Monitor panel parameters via CAN bus to externally mounted CXC-HP controller (0916020-002)</td>
<td>Monitor panel parameters via CAN bus to externally mounted CXC-HP controller (0916021-002)</td>
</tr>
<tr>
<td><strong>LED Indicators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>System Ok (Green) Breaker/Fuse Trip (Red)</td>
<td>System Ok (Green) Breaker/Fuse Trip (Red)</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>CSA C22.2 No. 609050-1-03</td>
<td>CSA C22.2 No. 609050-1-03</td>
</tr>
</tbody>
</table>

### Ordering Information

<table>
<thead>
<tr>
<th>S.No</th>
<th>Part Number</th>
<th>Panel Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0918001-100</td>
<td>CXDM-E3, 19/23”, 3RU, -48V, 400A, 21 Load Breakers, Interface Board</td>
</tr>
<tr>
<td>2</td>
<td>0918002-100</td>
<td>CXDM-E3, 19/23”, 3RU, -48V, 400A, 21 Load Breakers, L-ADIO</td>
</tr>
<tr>
<td>3</td>
<td>0918101-300</td>
<td>CXDM-E3, 23”, 3RU, -48V, 400A, 26 Load Breakers, Interface Board</td>
</tr>
<tr>
<td>4</td>
<td>0918102-300</td>
<td>CXDM-E3, 23”, 3RU, -48V, 400A, 26 Load Breakers, L-ADIO</td>
</tr>
</tbody>
</table>
## CXDM-E1

### Distribution Center

- 225A capacity distribution center with 10 load breaker positions
- Ultra compact, high density, utilizing standard plug-in circuit breakers
- Integrated low voltage battery disconnect and 2 breakers for battery protection
- Universal 19/23” rack mounting
- Compact 1RU high, maximizing space for revenue generating equipment
- Integrated controller I/O for 1.2 and 2kW Cordex rectifiers, simplifying installation

### P/N 0200066-001

#### Electrical

- **Voltage:** .................-48Vdc  
- **Current:** ......................225A DC max (200A load max)

#### Mechanical

- **Dimensions (excludes mounting brackets):**
  - mm:.............................45H x 432W x 318D
  - inches:..........................1.75H x 17.25W x 12.5D
- **Mounting:**..............................19/23”, flush/center mount

#### Performance/Features

- **Distribution:** ..................10x load breakers (Plug-in bullet style)  
  - 2x battery breakers (Plug-in bullet style)  
  - Maximum capacity: 125A single pole  
  - 200A double pole
- **Access:**..........................Front and rear required
- **Alarm interface:**..................DB25
- **LVD:**..............................225A Low voltage battery disconnect
- **LVD override:**...................Front mounted switch with status indicators
- **Shunt:**.............................400A battery shunt
- **Alarms:**............................LVBD  
  - Circuit breaker trip

### Connections

- **Load breaker:** ..................¼”-20 studs on ⅝” centers
- **Battery breaker:** ..................¼”-20 studs on ⅝” centers
- **Ground bar:** .......................13x sets ¼” studs on ⅝” centers

- **Rectifier Input:**
  - Hot:..............................2x sets ¼” holes on 1” centers
  - Return: ............................2x sets ¼” holes on 1” centers
- **Alarm:**.............................1.31 to 0.128mm² (#16 to #26AWG)

### Environmental

- **Temperature:** ...................-40 to +65°C (-40 to +149°F)  
  - Requires air circulation for above 30°C ambient
- **Humidity:** .......................0 to 95% non-condensing
- **Elevation:** ......................-500 to +4000m (-1640 to 13124ft)

### Agency Compliance

- **Safety:** .........................CSA C22.2, N0.60950
## DC Distribution Options

### Circuit Breakers

#### Bullet, Mid-Trip (Load Breakers)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>470-300-10</td>
<td>CB, 1P, 1A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-301-10</td>
<td>CB, 1P, 3A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-302-10</td>
<td>CB, 1P, 5A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-303-10</td>
<td>CB, 1P, 10A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-304-10</td>
<td>CB, 1P, 15A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-305-10</td>
<td>CB, 1P, 20A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-306-10</td>
<td>CB, 1P, 25A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-307-10</td>
<td>CB, 1P, 30A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-308-10</td>
<td>CB, 1P, 35A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-309-10</td>
<td>CB, 1P, 40A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-310-10</td>
<td>CB, 1P, 45A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-311-10</td>
<td>CB, 1P, 50A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
<tr>
<td>470-312-10</td>
<td>CB, 1P, 60A, 80Vdc, ¥₂'Bullet, Mid-trip</td>
</tr>
</tbody>
</table>

#### Breakers for use with Alpha Panels

- E2 Series, E1 Series, E3 Series, W Series

#### Bullet, Series-Trip (Battery Breakers)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>470-346-10</td>
<td>CB, 1P, 60A, 80Vdc, ¥₂'Bullet, Series-trip</td>
</tr>
<tr>
<td>470-347-10</td>
<td>CB, 1P, 100A, 80Vdc, ¥₂'Bullet, Series-trip</td>
</tr>
<tr>
<td>4700187</td>
<td>CB, 1P, 125A, 80Vdc, ¥₂'Bullet, Series-trip</td>
</tr>
</tbody>
</table>

#### Breakers for use with Alpha Panels

- 020-702-20, 030-728-20, 030-728-20, 030-706-20, 030-773-20, 030-763-20, E1 Series, E3 Series

#### Bolt-In Breakers (216 Style)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>470-120-10</td>
<td>CB, 1P, 100A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-125-10</td>
<td>CB, 1P, 125A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-188-10</td>
<td>CB, 1P, 150A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-171-10</td>
<td>CB, 1P, 175A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-121-10</td>
<td>CB, 1P, 200A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-081-10</td>
<td>CB, 1P, 225A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
<tr>
<td>470-228-10</td>
<td>CB, 1P, 250A, 125Vdc, ¥₂'Bolt-In</td>
</tr>
</tbody>
</table>

#### Breakers for use with Alpha Panels

- 020-534-20, 020-564-20
### GMT Fuses

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>4600093</td>
<td>180mA, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>4600094</td>
<td>1/4A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-004-10</td>
<td>1/2A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>4600095</td>
<td>3/4A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-006-10</td>
<td>1A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-081-10</td>
<td>1.3A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-082-10</td>
<td>1.5A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-083-10</td>
<td>2A, 60Vdc, GMT Fuse</td>
</tr>
<tr>
<td>460-013-10</td>
<td>3A, 60Vdc, GMT Fuse</td>
</tr>
</tbody>
</table>

### TPS/TLS Fuses

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>460-217-10</td>
<td>TPS/TLS Fuse, 5A, 170Vdc</td>
</tr>
<tr>
<td>460-218-10</td>
<td>TPS/TLS Fuse, 6A, 170Vdc</td>
</tr>
<tr>
<td>460-219-10</td>
<td>TPS/TLS Fuse, 10A, 170Vdc</td>
</tr>
<tr>
<td>460-220-10</td>
<td>TPS/TLS Fuse, 15A, 170Vdc</td>
</tr>
<tr>
<td>460-221-10</td>
<td>TPS/TLS Fuse, 20A, 170Vdc</td>
</tr>
<tr>
<td>460-222-10</td>
<td>TPS/TLS Fuse, 25A, 170Vdc</td>
</tr>
<tr>
<td>460-223-10</td>
<td>TPS/TLS Fuse, 30A, 170Vdc</td>
</tr>
<tr>
<td>460-224-10</td>
<td>TPS/TLS Fuse, 40A, 170Vdc</td>
</tr>
</tbody>
</table>

### TPL Fuse

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>460-140-10</td>
<td>TPL Fuse, 100A, 170Vdc</td>
</tr>
<tr>
<td>460-141-10</td>
<td>TPL Fuse, 150A, 170Vdc</td>
</tr>
<tr>
<td>460-142-10</td>
<td>TPL Fuse, 200A, 170Vdc</td>
</tr>
<tr>
<td>460-139-10</td>
<td>TPL Fuse, 250A, 170Vdc</td>
</tr>
<tr>
<td>460-144-10</td>
<td>TPL Fuse, 300A, 170Vdc</td>
</tr>
</tbody>
</table>

### Fuses for use with Alpha Panels

020-005-20, 020-103-20, 020-597-20, GMT 10A/10B
Bypass & Transfer Switches

A transfer switch allows safe switching from utility power to emergency power while maintaining isolation of each source from the other. Alpha offers a range of transfer and bypass switches as part of our total power solutions package. These switches allow for power to be seamlessly migrated between utility/line to battery backup or generator.

Alone or combined with an optional rack mount kit, the Universal Automatic Transfer Switch (UATS) and Universal Generator Transfer Switch (UGTS) can also be configured with a variety of output options such as surge arrestors, EMI filters and custom plates. Optional wall mount kits are also available.

The Alpha 255A External Maintenance Bypass Switch is a manually operated wrap-around mechanical switch for use with a UPS System such as AMPS80 HP. It provides a simple and effective means for bypassing the UPS while maintaining continuity of power to critical AC loads.
255A EXTERNAL BYPASS SWITCH

Indoor External Maintenance Bypass Switch

- Simple, safe and reliable means for bypassing UPS while maintaining continuity of power to critical AC loads
- Phase detector with lock out prevents unauthorized operation
- Safe-to-switch (IN PHASE) lamp
- Electromechanical manual override feature for emergency situations
- Auxiliary contacts for remote monitoring
- UL 508 listed

**P/N: 0200018**

**Electrical**

Voltage rating: .................................. 120/208 and 120/240 Vac (nominal)
Current rating: .................................. 255 A
Short circuit current rating: ............ 5kA

**Current vs. Temperature Rating**

<table>
<thead>
<tr>
<th>Current</th>
<th>Ambient Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>255A</td>
<td>40°C (104°F)</td>
</tr>
<tr>
<td>210A</td>
<td>45°C (113°F)</td>
</tr>
<tr>
<td>170A</td>
<td>50°C (1220°F)</td>
</tr>
</tbody>
</table>

**Mechanical**

Dimensions:
mm: .................................. 910H x 610W x 280D
inches: .................................. 36H x 24W x 11D
Weight: .................................. 79.5kg (175lbs)

**Environmental**

Temperature:
Operating: ...................... -20 to 40°C (-4 to 104°F)
Storage: ...................... -40 to 75°C (-40 to 167°F)
Operating altitude: .... Up to 3858m (12,000ft)
Storage altitude: ........ Up to 4572m (15,000ft)

**Agency Compliance**

Safety: ......................... UL / cUL 508
**UATS**

>120V/30A  
>230V/16A  

Alpha’s Universal Automatic Transfer Switch is designed as a three stage bypass switch that allows for the UPS to be bypassed and still maintain the ability to keep batteries fully charged.

It acts as a fail-safe device by switching the critical load to the utility line should a fault occur in the UPS. The UATS ensures that clean power is always provided to the critical load, ensuring that your mission-critical equipment always remains running in the event of an outage. This transfer switch also includes a standard manual bypass switch which eliminates costly equipment downtime while servicing the UPS or replacing the batteries.

**Dimensions:** mm: 81H x 135W x 152D  
inches: 3.25H x 5.3W x 6.0D

**Mounting options:** Wall, shelf or single side rack mount

---

**UGTS**

>120V/30A  
>230V/16A  

Alpha’s Universal Automatic Generator Transfer Switch automatically transfers the input to the UPS from the utility line to a portable AC generator.

The UGTS allows the generator to recharge the batteries and ensure your mission-critical equipment remains in operation during extended power outages. For manually connecting or disconnecting a generator, a standard switch is included.

**Dimensions:** mm: 81H x 135W x 152D  
inches: 3.25H x 5.3W x 6.0D

**Mounting options:** Wall, shelf or single side rack mount

---

**Alpha Maintenance Bypass Switch**

>120V  
>230V option not available  

Alpha’s Maintenance Bypass Switch allows the user to manually bypass the UPS system to safely perform service or routine maintenance.

When working in conjunction with the Alpha U-ATS, the manual-only maintenance bypass switch can be installed into the traffic controller cabinet, allowing for the complete UPS system to be bypassed for safe emergency replacement.

**Dimensions:** mm: 117H x 120.6W x 165D  
inches: 4.6H x 4.75W x 6.5D

**Mounting options:** Wall, 4 point shelf mount or single side rack mount

---

**Other Mounting Options**

> Rack mount kit 2RU – 19 or 23”  

Can be configured with U-ATS, U-GTS, surge option and/or receptacle plate for heating mats.
Enclosures

The Alpha enclosure product line provides a full range of rugged cabinets for any application, including secure indoor and outdoor uses.

Designed, tested and compliant with the highest industry operating standards, Alpha outdoor enclosures are equipped with control systems that maintain temperatures within the specified operating ranges of internally mounted equipment. Each enclosure offers flexible thermal management solutions based on open and/or closed loop design to enable convenient matching to load and environmental factors.

Alpha enclosures provide application flexibility with a variety of adjustable components including moveable equipment mounting racks, different types of mounting hardware, swing racks, slide out equipment rails, different styles of cable entry ports and many other options and features.

Combine your Alpha Enclosure with Alpha power and you have an optionally integrated, reliable and efficient power plant.

Enclosure Naming Convention

Alpha outdoor enclosures are divided into 3 categories: Standard Enclosure (SE), Premium Enclosure (PE), and Tailored Enclosure (TE)

**SE** – Standard off-the-shelf product with high degree of configurability both in power & cooling options.

**PE** – Premium enclosure solutions share the same qualities as SE but with greater focus towards aesthetics and environmental protection as governed by the GR-487 standard.

**TE** – Tailored solutions are custom engineered to meet the requirements of specific customers.

example:

<table>
<thead>
<tr>
<th>Character</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tailored Enclosure</td>
</tr>
<tr>
<td>2</td>
<td>Height (in)</td>
</tr>
<tr>
<td>3</td>
<td>Width (in)</td>
</tr>
<tr>
<td>4</td>
<td>Depth (in)</td>
</tr>
</tbody>
</table>

**TE 27 - 22 18**
ENCRYPTION SELECTION CONSIDERATIONS

What are the requirements for the base enclosure?

<table>
<thead>
<tr>
<th>Dimensions (in/mm)</th>
<th>Mounting</th>
<th>Accessibility</th>
<th>Cable entry/exit</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height:</td>
<td>□ Pad</td>
<td>□ Rack</td>
<td>□ Front</td>
<td>□ Top</td>
</tr>
<tr>
<td>Width:</td>
<td>□ Pole</td>
<td>□ Pedestal</td>
<td>□ Rear</td>
<td>□ Bottom</td>
</tr>
<tr>
<td>Depth:</td>
<td>□ Wall</td>
<td></td>
<td>□ Top</td>
<td>□ Sides</td>
</tr>
</tbody>
</table>

What are the environmental conditions?

<table>
<thead>
<tr>
<th>Temperature (°C/°F)</th>
<th>Wind Driven</th>
<th>Seismic zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum:</td>
<td>□ Rain</td>
<td>□ Dust</td>
</tr>
<tr>
<td>Maximum:</td>
<td>□ Snow</td>
<td>Other</td>
</tr>
</tbody>
</table>

What is the electrical service available at the location?

<table>
<thead>
<tr>
<th>AC Voltage</th>
<th>Main breaker rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 120Vac</td>
<td>□ 15A</td>
</tr>
<tr>
<td>□ 120/208Vac</td>
<td>□ 20A</td>
</tr>
<tr>
<td>□ 120/240Vac</td>
<td>□ 30A</td>
</tr>
<tr>
<td>□ 277/480Vac</td>
<td>□ 50A</td>
</tr>
<tr>
<td>□ 347/600Vac</td>
<td>Other</td>
</tr>
</tbody>
</table>

What are the operating parameters of your equipment?

<table>
<thead>
<tr>
<th>AC Voltage</th>
<th>DC Voltage</th>
<th>Total load current (A)</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 24Vac</td>
<td>□ 208Vac</td>
<td>□ 12Vdc</td>
<td>□ 19&quot; rack</td>
</tr>
<tr>
<td>□ 120Vac</td>
<td>□ 240Vac</td>
<td>□ 48Vdc</td>
<td>Maximum:</td>
</tr>
<tr>
<td>□ 125Vdc</td>
<td>Other:</td>
<td>Other: Max:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equipment space (RU)</th>
<th>Operating temperature range</th>
<th>Equipment heat dissipation (Btu/hr or W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1:</td>
<td>Min:</td>
<td>Max:</td>
</tr>
<tr>
<td>Item 2:</td>
<td>Min:</td>
<td>Max:</td>
</tr>
<tr>
<td>Item 3:</td>
<td>Min:</td>
<td>Max:</td>
</tr>
</tbody>
</table>

Which climate control option is preferable with the enclosure?

<table>
<thead>
<tr>
<th>Cooling/Heating</th>
<th>Thermal Management Selection Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Fan(s)</td>
<td>• Fan(s) - open loop system utilizing filtered outside ambient air to cool the electronics</td>
</tr>
<tr>
<td>□ Air conditioner</td>
<td>• Air conditioner - closed loop system where electronics require an environment cooler than ambient</td>
</tr>
<tr>
<td>□ Heater</td>
<td>• Heat exchanger - closed loop system that keeps ambient air contaminants out of the enclosure but temperature inside is slightly above ambient</td>
</tr>
</tbody>
</table>

What are the battery requirements?

<table>
<thead>
<tr>
<th>Application</th>
<th>Battery chemistry</th>
<th>Discharge time</th>
<th>Recharge time</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Cycle</td>
<td>□ Lead-acid</td>
<td>Hour(s):</td>
<td>Hour(s):</td>
</tr>
<tr>
<td>□ Float</td>
<td>□ Ni-Cad</td>
<td>Minute:</td>
<td>Minute:</td>
</tr>
</tbody>
</table>

How is the power distributed to the critical loads?

□ Fuse (Specify size and quantity if known): 
□ Breaker (Specify size and quantity if known): 

Have you considered these system options?

□ Load center | □ Surge suppression | □ Fiber winding box |
□ Generator inlet | □ Meter base | □ Convenience outlet(s) |
□ Transfer switch | □ Battery heater mat | Specify other options required: |

Are there any requirements for agency compliance?

<table>
<thead>
<tr>
<th>GR standard</th>
<th>NEBS</th>
<th>Safety compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR487:</td>
<td></td>
<td>□ Level 1</td>
</tr>
<tr>
<td>GR1089:</td>
<td>□ Level 2</td>
<td>□ CE</td>
</tr>
<tr>
<td>GR13:</td>
<td>□ Level 3</td>
<td>Other:</td>
</tr>
<tr>
<td>GR63:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ALPHA ENCLOSURE APPLICATION

<table>
<thead>
<tr>
<th>Enclosure</th>
<th>DAS/Backhaul / other wireless applications</th>
<th>Cell Site Powering</th>
<th>Fiber Power</th>
<th>Line Power</th>
<th>Traffic &amp; ITS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE13-2128</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>128</td>
</tr>
<tr>
<td>TE20-2120</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
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<tr>
<td>TE22-2210</td>
<td>✔</td>
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<td>130</td>
</tr>
<tr>
<td>TE27-2218</td>
<td>✔</td>
<td>✔</td>
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<td>131</td>
</tr>
<tr>
<td>TE27-2218 Traffic</td>
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<td></td>
<td></td>
<td>✔</td>
<td>132</td>
</tr>
<tr>
<td>TE36-2120</td>
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<td>✔</td>
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</tr>
<tr>
<td>TE40-2425</td>
<td>✔</td>
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<td></td>
<td>✔</td>
<td></td>
<td>134</td>
</tr>
<tr>
<td>SE41-2722</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>135</td>
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<tr>
<td>SE48-1616</td>
<td>✔</td>
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<td>✔</td>
<td>136</td>
</tr>
<tr>
<td>TE60-3030</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
<td>137</td>
</tr>
<tr>
<td>TE72-3030 S</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>138</td>
</tr>
<tr>
<td>TE72-3030 D</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>TE72-6030</td>
<td>✔</td>
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<td>TE84-3030</td>
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<td></td>
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<td>141</td>
</tr>
<tr>
<td>CXPS-48-500-IWM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td>142</td>
</tr>
</tbody>
</table>
TE13-2128
13” Ceiling Mount Outdoor Enclosure

- IP66 rated ceiling mount power system enclosure
- 13” tall, 21” wide and 28” deep provides a compact overall footprint ideal for oDAS applications
- Powder coat finish provides excellent corrosion protection
- Front and rear doors provides greater access for equipment installation and wiring
- Designed for use with FXM series AC Outdoor UPS with AlphaCell GEL batteries

Consult your Alpha representative for P/N configurations

**Electrical**

Input voltage: 120VAC, 60Hz, single phase
Output voltage: 120VAC
Output power: 1700W (max)

**Mechanical**

Dimensions:
mm: 330H x 533W x 711D
inches: 13H x 21W x 28D
Weight (empty): 20kg (45lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powder coat
Equipment space: FXM UPS Power Module with 3RU of available equipment space
Battery shelf: Space for 4 x AlphaCell 85GXL (50Ah)

**Hardware**

Hinge type: Piano hinge on both front and rear door
Door latch: Vise action compression latch
Battery shelf: Space for 4 x AlphaCell 85GXL (50Ah)

**HVAC**

Cooling: Sealed cabinet with hydrogen vent cap

**Environmental**

Temperature:
Operating: -40 to 46°C (-40 to 115°F)
Storage: -40 to 85°C (-40 to 185°F)

**Installation**

Access: Front and rear access

**Enclosure options**

Mounting: Ceiling mount only
Consult factory for other options

**System Specifications (as shown)**

- FXM2000 Outdoor AC UPS
- 4 x AlphaCell 85GXL (50Ah) batteries
- Fiber management tray
- Customer equipment

**Agency Compliance**

NEMA rating: IP66
Enclosure Options

Mounting: Wall, pole, pedestal or rack

System Specifications (as shown)

- 48Vdc Cordex rectifier shelf comes with DC distribution
- 4 x 91Ah batteries
- External 8 position AC load centre with surge arrestor
- Dual filtered fan cooling
- Alarm terminal block
- Ground bar

Agency Compliance

CSA/UL: C22.2 No. 60950
NEMA rating: Type 3R (CSAC22.2 No 94-M91)
22” NEMA 4 Outdoor Enclosure

- NEMA 4 rated outdoor enclosure designed for use with 24V/400W or 48V/650W Cordex PSU module and batteries
- 22” tall, 22” wide and 10” deep provides a compact overall footprint ideal for space constrained applications
- Powder coat finish provides excellent corrosion protection

Consult your Alpha representative for P/N configurations

Electrical

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>120VAC/240VAC, 60Hz, single phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>24/48Vdc</td>
</tr>
<tr>
<td>Output power</td>
<td>24V/400W, 48/650W</td>
</tr>
</tbody>
</table>

Mechanical

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>559H x 559W x 254D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (empty)</td>
<td>25kg (55lbs)</td>
</tr>
<tr>
<td>Construction</td>
<td>High strength corrosion resistant aluminum</td>
</tr>
<tr>
<td>Finish</td>
<td>Powder coat</td>
</tr>
<tr>
<td>Equipment space</td>
<td>Back plate available for mounting customer equipment Cordex 24V/400W or 48V/650W module mounted on door</td>
</tr>
</tbody>
</table>

Hardware

<table>
<thead>
<tr>
<th>Hinge type</th>
<th>2 position lift-off hinge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door latch</td>
<td>3 point latch</td>
</tr>
<tr>
<td>Battery shelf</td>
<td>Space for 4 x 17Ah batteries or 2 x 33Ah batteries</td>
</tr>
</tbody>
</table>

HVAC

- Sealed cabinet with hydrogen vent cap

Environmental

<table>
<thead>
<tr>
<th>Temperature</th>
<th>-40 to 46°C (-40 to 115°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>-40 to 85°C (-40 to 185°F)</td>
</tr>
</tbody>
</table>

Installation

Access: Front access only

Enclosure options

Mounting: Pole or Wall

System Specifications (as shown)

- Cordex 48V/650W PSU module
- 4 x 17Ah batteries
- GFCI convenience outlet
- Back plate for customer equipment
- Battery heater mat
- AC mains disconnect
- Surge arrestor

Agency Compliance

CSA/UL: C22.2 No. 60950
NEMA rating: NEMA 4
Compact enclosure design provides ideal fit for locations where aesthetics and footprint are important
Light-weight powder coated aluminum construction offers superior corrosion resistant properties
Large sun shield reduces solar heat load inside cabinet
180° stainless steel piano-hinged door make installation and maintenance easy and convenient
Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
Various mounting options make this highly versatile in space constrained mobile broadband applications

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
mm: 687H x 559W x 457D
inches: 27H x 22W x 18D
Weight: 27.2kg (60lbs)
Construction: High strength corrosion resistant aluminum
Finish: Power coated white color
Equipment space: 5RU space with one battery shelf
Equipment rails: EIA standard 19"
Cable entrance:
   Bottom of enclosure: 1 x 3" diameter knock-out
   Rear of enclosure: 4 x 1.125" diameter knock-out

Hardware

Hinge type: Stainless steel piano hinge
Door prop: Aluminum rod, 2 locking open positions
Door latch: Bellcore 216 compression lock with pad lock collar

HVAC

Cooling: Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)
Ventilation: Door installed louvers

Environmental

Temperature:
   Operating: -40 to 46°C (-40 to 115°F)
   Storage: -40 to 85°C (-40 to 185°F)

Installation

Access: Front hinged door provides full front access

Maintenance

Door installed louvers: Equipped with splash baffle (optional filters available)

Enclosure Options

Mounting: Pole, wall, pedestal or stake mount

System Specifications (as shown)

- Battery shelf with 4x AlphaCell™ 195GXL-FT batteries
- FXM1100 UPS
- Pedestal mount kit

System Options

- Alpha universal automatic transfer switch
- Alpha universal generator transfer switch
- AlphaGuard battery balancer
- Battery heater mats
- Transient voltage surge suppression device

Agency Compliance

CSA/UL: C22.2 No.60950
Telcordia: GR-13-CORE
NEMA rating: 3R
TE27-2218
(FORMERLY MMOE)

27” General Purpose Outdoor Traffic Enclosure

- Traffic grade aluminum enclosure protects battery backup power systems from outdoor elements
- Various mounting options (including pole-mount) provide a flexible solution for space constrained traffic applications
- Large sun shield reduces solar heat load inside cabinet
- Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano-hinged door makes installation and maintenance easy and convenient
- Three-point latching mechanism with Corbin Type 2 lock for maximum security

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 687H x 559W x 457D
- inches: 27H x 22W x 18D

Weight: 27.2kg (60lbs)

Construction: High strength corrosion resistant 0.125” thick aluminum

Finish: Natural aluminum or painted gray

Equipment space: 7RU space with one battery shelf

Equipment rails: EIA standard 19”

Cable entrance:
- Bottom of enclosure: 1 x 3” diameter knock-out (2⅛” trade size)
- 4 x 1.125” diameter knock-out (¼” trade size)
- Rear of enclosure: 4 x 1.125” diameter knock-out (¼” trade size)

Hardware

Hinge type: Stainless steel piano hinge

Door prop: Aluminum rod, 2 locking open positions

Door latch: 3 point latch with integrated Corbin Type 2 lock

HVAC

Cooling: Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)

Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40 to 46°C (-40 to 115°F)
- Storage: -40 to 85°C (-40 to 185°F)

Installation

Access: Front hinged door provides full front access

Maintenance

Door installed louver: Equipped with washable filter

Enclosure Options

Mounting: Pole, host, wall, or pedestal

System Specifications (as shown)

System Options

- Battery shelf with 4x AlphaCell™ 85GXL batteries
- FXM2000 UPS
- Universal automatic transfer switch

Agency Compliance

NEMA rating: 3R
TE36-2120
(Formerly TE25XH)

36" General Purpose Outdoor Enclosure

- Multipurpose indoor/outdoor enclosure designed for medium power (AC or DC) applications requiring batteries, power equipment or both
- Various mounting options provide a flexible solution for space constrained or remote applications
- Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
- Durable aluminum construction provides excellent corrosion resistance
- AC and DC power connections pre-wired at factory reduce field installation time

Consult your Alpha representative for P/N configurations

**Mechanical**

<table>
<thead>
<tr>
<th>Dimensions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm: 914H x 544W x 518D</td>
</tr>
<tr>
<td>inches: 36H x 21.4W x 20.4D</td>
</tr>
<tr>
<td>Weight: 41kg (90lbs)</td>
</tr>
<tr>
<td>Construction: High strength corrosion resistant aluminum</td>
</tr>
<tr>
<td>Finish: Powdercoat</td>
</tr>
<tr>
<td>Equipment space: 19RU (without batteries)</td>
</tr>
<tr>
<td>Cable entrance: Knockouts located on the bottom and rear of enclosure</td>
</tr>
<tr>
<td>Equipment rails: 19”</td>
</tr>
</tbody>
</table>

**Hardware**

- Hinge type: 3 position lift off hinge
- Handle: Padlockable
- Door latch: 3 point latch
- Equipment shelves: Optional
- Battery trays (qty.): 2 (Note: Equipment space reduced to 5RU with 8 x 91Ah batteries)

**HVAC**

- Cooling: Air conditioner w/heater/heat exchanger/thermostat controlled filtered fan cooling
- Ventilation: Door installed louvers

**Environmental**

- Operating: -40 to 46°C (-40 to 115°F)
- Storage: -40 to 85°C (-40 to 185°F)

**Installation**

- Access: Full front access with removable rear louver panel for equipment installation

**Maintenance**

- Door installed louver: Equipped with washable/replaceable filter

**Enclosure Options**

- Mounting: Wall, pole, pedestal or rack

**System Specifications (as shown)**

- 48Vdc Cordex rectifier shelf c/w DC distribution
- External 8 position AC distribution with 30A generator connector
- 8 position GMT fuse panel
- Dual filtered fan cooling
- Alarm terminal block
- Ground bar

**System options**

- Combination meter base
- Main breaker disconnect
- Battery heater mat
- Heat exchanger 50W/°C
- Air Conditioner 2000 BTU/hr
- AC load centre
- AC surge protector

**Agency Compliance**

- CSA/UL: C22.2 No. 60950
- NEMA rating: Type 3R (CSAC22.2 No 94-M91)
TE40-2425
(Formerly TE49)

40" GR487 Dual Compartment Enclosure

- Dual compartment design provides operational cost savings using a heat exchanger to cool equipment in the sealed upper compartment and ambient cooling for batteries in the vented lower compartment
- 9RU of rack space in the top section provides room for rectifiers, distribution and customer equipment
- Pre-configured -48Vdc power system capable of delivering maximum power of 6kW (N+1)
- 40” tall, 24” wide and 25” deep provides a compact overall footprint ideal for oDAS applications
- Certified to GR-487 requirements, the enclosure is designed for high reliability and long operating life in extreme environments
- Battery Expansion Cabinet (BEC) allows for an additional string of -48Vdc batteries each rated at 180Ah or less

**Consult your Alpha representative for P/N configurations**

**Electrical**

- Input voltage: 120/240Vac, 60Hz single phase
- Output voltage: 48Vdc
- Output power: -48V 6kW (N+1)
- DC distribution: 18 breaker positions
- AC distribution: AC load center

**Mechanical**

- **Base enclosure dimensions:**
  - mm: 1016H x 610W x 635D
  - inches: 40H x 24W x 25D
- **Base enclosure w/ BEC dimensions:**
  - mm: 1422H x 610W x 635D
  - inches: 56H x 24W x 25D
- **Base enclosure Weight (no batteries):** 115kg (253lbs)
- **Mounting:** Plinth, Pole and Wall mount
- **Cooling:** Heat exchanger for power compartment
  - Forced air ambient for battery compartment
- **Enclosure:** Aluminum, 5052-H32
- **Rack units:** 19", 9RU (UC)

**Environmental**

- **Operating temperature:** -40 to +46°C (-40 to 115°F)
- **Storage temperature:** -40 to +85°C (-40 to +185°F)
- **Humidity:** 0 to 95% non-condensing
- **Elevation:** 3600 m, see operating temperature (12,000ft)
- **Weather tightness:** NEMA Type 3R

**Other Information**

- **Alarm:** Connection: Terminal block
  - Description: High/low temperature, intrusion, fan fail, AC fail
  - Chassis ground: Multiple connection Bus bar located in cabinet
  - Security: Pad-lockable doors with socket pin-head key

**Enclosure options**

- Wall Mount
- Pole Mount
- Plinth Mount
- Battery Expansion Cabinet
- AC surge protection
- DC surge protection
- AC generator
- Battery heater mat
- Meter socket
- AC load Centre

**Agency Compliance**

- **CSA:** C22.2 No 60950-01-03
- **UL:** Std. No 60950-01
- **CABINET:** NEMA Type 3R (CSA C22.2 No 94-M91)
- **SEISMIC:** Compliant to Zone 4 requirements
- **GR487:** Compliant to GR487
SE41-2722

41” General Purpose Outdoor Enclosure

- Configurable-to-order outdoor enclosure designed for mobile broadband applications
- 23” mounting rails with adjustable front to back rack angles (23” to 19” adapter plates available as an option)
- 20RU of available equipment space for power, batteries, accessory panel and customer equipment
- Rear access gland plate provides greater flexibility to access customer installed equipments
- Flexible thermal management solutions (including fan, heat exchanger and air conditioning variants) enable convenient matching to load and environmental parameters
- Various mounting options available: wall, pole, plinth and pad

Consult your Alpha representative for P/N configurations

**Mechanical**

- Dimensions:
  - mm: 1051H x 701W x 559D
  - inches: 41.4H x 27.6W x 22D
- Weight: 52kg (115lbs)
- Construction: High strength corrosion resistant aluminum
- Finish: Powdercoat
- Equipment rails: 23” (23” to 19” adapter plates available as an option)
- Equipment space: 20RU
- Cable entrance: Knockouts located on sides, bottom and rear of enclosure

**Hardware**

- Hinge type: 3-position lift-off hinge
- Door prop: Wind-stop with automatic lock
- Door latch: 3 point latch with padlockable L-handle

**HVAC**

- Cooling:
  - Thermostat controlled filtered fan cooling
  - Air Conditioner (120Vac, 2000 BTU/hr)
  - Heat Exchanger (48Vdc, 50W/C)
  - Integrated with Air Conditioner (500W)

**Environmental**

- Temperature:
  - Operating: -40 to 46°C (-40 to 115°F)
  - Storage: -40 to 85°C (-40 to 185°F)

**Installation**

- Access: Full front access as well as rear access with a removable gland plate

**Enclosure Options**

- Mounting:
  - SE41-2722: Wall, pole, plinth and pad

**Agency Compliance**

- NEMA rating: 3R
- CSA: C22.2 No. 60950
48" Outdoor Traffic BBS Enclosure

- Traffic grade aluminum enclosure protects battery backup power systems (BBS) from outdoor elements
- Various mounting options (including pole-mount) provide a flexible solution for traffic applications
- Large sun shield reduces solar heat load inside the cabinet
- Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano hinged door with two locking open positions makes internal component installation and maintenance easy and convenient
- Three-point latching mechanism with Corbin Type 2 lock (or optional Best lock) for maximum security

**Consult your Alpha representative for P/N configurations**

**Mechanical**

- **Dimensions:**
  - mm: 1220H x 419W x 419D
  - inches: 48H x 16.5W x 16.5D
- **Weight:** 34kg (75lbs)
- **Construction:** High strength corrosion resistant aluminum
- **Finish:** Natural aluminum
- **Equipment space:** 8RU space (without generator inlet) with two (2) battery shelves
- **Equipment rails:** EIA standard 19" (vertical)
- **Cable entrance:** Bottom of enclosure: 1 x 76mm (3") dia. knock-out

**Hardware**

- **Hinge type:** Stainless steel piano hinge
- **Door prop:** Aluminum rod, 2 locking open positions
- **Handle:** Stainless steel handle with padlock fitting for extended life and improved look
- **Door latch:** 3 point latch with integrated Corbin Type 2 lock (or optional Best lock) for maximum security

**HVAC**

- **Cooling:** Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)
- **Ventilation:** Door installed louver

**Environmental**

- **Temperature:**
  - Operating: -40 to 46°C (-40 to 115°F)
  - Storage: -40 to 85°C (-40 to 185°F)

**Installation**

- **Access:** Removable bottom shelf for easy wiring access

**Maintenance**

- **Door installed louver:** Equipped with washable filter
- **Other:** Bug screen protected top vent

**Enclosure Options**

- **Mounting:** Side mount (standard) - designed to mount to the side of most traffic enclosure cabinets
- **Ground mount kit (optional)**
- **Pole mount kit (optional)**

**System Specifications (as shown)**

- 2 Battery shelf with 4x AlphaCell 220GXL batteries
- FXM1100 UPS
- Universal automatic transfer switch
- Universal generator transfer switch

**System Options**

- Generator support: locking generator access door and L5-30 F1 plug
- Tamper switch
- Tilt switch
- AlphaGuard™ battery balancer
- Door activated interior light
- Battery heater mats
- "On Battery" indicator light

**Agency Compliance**

- CSA/UL, CE: UL50E/C22.2 No.94
- NEMA rating: 3R
TE60-3030
60" General Purpose Outdoor Enclosure

- 30RU available equipment space provides room for rectifiers, distribution, customer equipment and batteries
- Pad-lockable door and durable powder coated aluminum construction allow for secure outdoor or indoor applications
- Flexible thermal management solutions enable convenient matching to load and environmental parameters

Consult your Alpha representative for P/N configurations

### Electrical

**Voltage:** 120/240Vac, 60Hz single phase

### Mechanical

**Dimensions:**
- mm: 1524H x 762W x 762D
- inches: 60H x 30W x 30D

**Weight (empty):** 120kg (265lbs)

**Construction:** High strength corrosion resistant aluminum

**Finish:** Powder coat

**Equipment space:** 30RU (23" rack mount)

**Cable entrance:** Multiple KO locations

### Hardware

**Handle:** Padlockable

**Door latch:** 3 point latch

**Battery trays (qty):** Up to 4 if used as a battery only enclosure

### HVAC

**Cooling:** Fan cooled only

**Heating:** Battery heater mats

### Environmental

**Temperature:**
- Operating: -40 to 46°C (-40 to 115°F)
- Storage: -40 to 85°C (-40 to 185°F)

### Installation

**Access:** Front and rear access

### Enclosure options

**AC distribution:** AC load center

**TVSS:** 120/240Vac surge arrestor

**Mounting:** Pad or platform mount

Consult factory for other options

### Agency Compliance

**CSA/UL:** C22.2 No. 60954

**NEMA rating:** Type 3R (CSA C22.2 No. 94-M91)

Consult factory for other configurations of TE60-3030
### Consult your Alpha representative for P/N configurations

#### Electrical

**Voltage:**
- 120/240 Vac, 60 Hz single phase

#### Mechanical

**Dimensions:**
- mm: 1829H x 762W x 762D
- inches: 72H x 30W x 30D

**Weight (empty):**
- 250 kg (550 lbs)

**Construction:**
- High strength corrosion resistant aluminum

**Finish:**
- Powder coat

**Equipment space:**
- 39RU (23” rack mount) in power enclosure
- 5 battery trays in battery enclosure

**Cable entrance:**
- Knockouts on sides and bottom

#### Hardware

**Hinge type:**
- 4 position lift off hinges

**Handle:**
- Padlockable

**Door latch:**
- 3 point latch

**Battery trays (qty):**
- Configurable based on application requirements

#### HVAC

**Cooling:**
- 4K BTU air conditioner with EVS or fan cooled

**Heating:**
- 500W heater integrated with air conditioner
- Battery enclosure (battery heater mats)

**Audible noise:**
- <65 dBA

---

### Environmental

**Temperature:**
- Operating: -40 to 46°C (-40 to 115°F)
- Storage: -40 to 85°C (-40 to 185°F)

### Installation

**Access:**
- Removable rear panels and front hinged door provide full enclosure access

### Enclosure options

**AC distribution:**
- AC load center

**TVSS:**
- 120/240 Vac surge arrestor

**Mounting:**
- Pad or platform mount

Consult factory for other options

### System Specifications (as shown)

- **Power enclosure**
  - Cordex 2kW rectifiers
  - Air conditioner with EVS
  - AC load center
  - 2 battery trays

- **Battery enclosure**
  - 5 battery trays for GNB 155Ah or larger FT batteries

---

### Agency Compliance

- **CSA/UL:**
  - C22.2 No. 60954

- **Telcordia:**
  - GR-487 compliance – contact factory for specific compliances

- **NEMA rating:**
  - Type 3R (CSA C22.2 No. 94-M91)
Consult your Alpha representative for P/N configurations

**Electrical**

**Voltage:** 120/240VAC, 60Hz single phase  
**Output voltage:** 48Vdc  
**Output power:** 16kW (N+1) max  
**DC distribution:** 36 breaker positions

**Mechanical**

**Dimensions:**  
- mm: 1829H x 762W x 762D  
- inches: 72H x 30W x 30D  
**Weight (empty):** 295kg (650lbs)  
**Construction:** High strength corrosion resistant aluminum  
**Finish:** Powder coat  
**Equipment space:** 11RU (23" rack mount) in upper compartment  
- power enclosure  
- 3 battery trays in lower compartment (power enclosure)  
- 5 battery trays in battery enclosure  
**Cable entrance:** Knockouts on sides and bottom

**Hardware**

**Hinge type:** 4 position lift off hinges  
**Handle:** Padlockable  
**Door latch:** 3 point latch  
**Battery trays (qty):** Configurable based on application requirements

**HVAC**

**Cooling:** Power enclosure (heat exchanger for upper compartment and forced ambient air for battery compartment)  
**Heating:** Battery enclosure (fan cooled)  
**Audible noise:** <65 dBA

**Environmental**

**Temperature:**  
- Operating: -40 to 46°C (-40 to 115°F)  
- Storage: -40 to 85°C (-40 to 185°F)

**Installation**

**Access:** Removable rear panels and front hinged door provide full enclosure access

**Enclosure options**

**Mounting:** Pad or platform mount  
Consult factory for other options

**System Specifications (as shown)**

- Power enclosure  
  - Cordex 4kW rectifiers  
  - Heat exchanger  
  - 3 battery trays
- Battery enclosure  
  - 5 battery trays for GNB 155Ah or larger FT batteries

**Agency Compliance**

- **CSA:** C22.2 No. 60950-01-03  
- **UL:** Std. No 60950-01  
- **Telcordia:** GR-487 compliance – contact factory for specific compliances  
- **NEMA rating:** Type 3R (CSA C22.2 No. 94-M91)
# TE72-6030

## 72" Double Door Cell Site Enclosure

- Detachable enclosure design allows for easy separation and transport for roof-top installations eliminating the use of a crane
- 30RU of customer equipment space on one side with power, distribution and batteries located on the other side
- Maximum power supported is 10.8kW @ -48Vdc with 48 plug-in style breakers
- Flexible thermal management solutions enable convenient matching to load and environmental parameters
- Multiple access points from the outside provide greater flexibility in the installation and wiring of customer equipment
- Designed to meet seismic, salt fog and wind-driven rain requirements as per Telcordia GR487 standard

### Consult your Alpha representative for P/N configurations

<table>
<thead>
<tr>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage: 120/240Vac single phase or 208Vac three phase</td>
</tr>
<tr>
<td>Output voltage: 48Vdc nominal</td>
</tr>
<tr>
<td>Output power: 10.8kW max (CXRF 48-1.2 kW rectifier shelves)</td>
</tr>
<tr>
<td>DC distribution: 48 plug-in style breakers</td>
</tr>
</tbody>
</table>

### Mechanical

| Dimensions: mm: 1829H x 1524W x 762D |
| Weight: Cabinet less batteries & rain hood: 602kg (1325lbs) Rain hood: 48kg (105lbs) |
| Construction: High strength corrosion resistant aluminum |
| Finish: Powder coat |
| Cable entrance: Removable panels on plinth |
| Generator connection: Cam-Lok connectors (optional) |

### Hardware

| Hinge type: 3-position lift-off hinge |
| Handle: Stainless steel |
| Door latch: 3 point latch with L-handle for pad locking |
| Battery trays (qty): 3 included with integrated 100A breaker per string |

### HVAC

| Cooling: Thermostat-controlled filtered fan cooling (both enclosures) |
| Heating: 1500W heater integrated with air conditioner |
| Audible noise: <65 dBA |

### Environmental

- **Temperature:**
  - Operating: -40 to 46°C (-40 to 115°F)
  - Storage: -40 to 85°C (-40 to 185°F)

### Installation

| Access: Full front access as well as rear access with removable back panel |

### Enclosure Options

- **AC load center:** 200A load center
- **AC generator connection:** Cam-Lok connectivity with manual transfer switch
- **AC surge protection:** 50kA rated SPD with LED fail indicator and audible alarm

Consult factory for other options

### System Specifications (as shown)

- **Power enclosure**
  - Cordex 1.2HP rectifiers
  - 10,000 BTU/Hr air conditioner
  - 3 battery trays
  - 48 plug-in style breakers
  - Filtered fan cooling

### Agency Compliance

- **CSA:** C22.2 No. 60950-01-03
- **UL:** Std. No 60950-01
- **NEMA rating:** Type 3R (CSA C22.2 No. 94-M91)
Consult your Alpha representative for P/N configurations

**Electrical**

Voltage: ................. 120/240 Vac, 60Hz single phase

**Mechanical**

Dimensions: 
  - mm: 2134H x 762W x 762D
  - inches: 84H x 30W x 30D
Weight (empty): .... 300 kg (660 lbs)
Construction: ............... High strength corrosion resistant aluminum
Finish: ...................... Powder coat
Equipment space: .......... 44RU (23" rack mount)
Cable entrance: .............. Knockouts on sides and bottom

**Hardware**

Hinge type: .......... 5 position lift off hinges
Handle: ................. Padlockable
Door latch: ............... 3 point latch
Battery trays (qty) ........ Configurable as battery only enclosure for up to 5 battery trays

**HVAC**

Cooling: ................. 4K BTU air conditioner, heat exchanger or fan cooled
Heating: ................. 500W heater integrated with air conditioner and battery heater mats
Audible noise: .......... <65 dBA

**Environmental**

Temperature:
  - Operating: ............ -40 to 46°C (-40 to 115°F)
  - Storage: ............... -40 to 85°C (-40 to 185°F)

**Installation**

Access: ................. Removable rear panels and front hinged door provide full enclosure access

**Enclosure options**

AC distribution .......... AC load center
TVSS: ...................... 120/240 Vac surge arrester
Mounting: ................ Pad or platform mount
Consult factory for other options

**System Specifications (as shown)**

- Power enclosure
  - Cordex 2kW rectifiers
  - Heat exchanger
  - 3 battery trays

**Agency Compliance**

CSA/UL: .................... C22.2 No. 60954
Telcordia: ................. GR-487 compliance – contact factory for specific compliances
NEMA rating: .............. Type 3R (CSA C22.2 No. 94-M91)
Wall-mountable indoor enclosure provides a flexible solution for space constrained applications
Light weight powder coated aluminum enclosure is easy to install and offers superior corrosion properties
Cordex-based DC power system offers modularity and scalability in power up to 500W
Battery shelf can accommodate up to two 48Vdc strings of batteries
Low maintenance and high efficiency reduces overall cost of ownership for the user

Consult your Alpha representative for P/N configurations

**Mechanical**

**Dimensions:**
- mm: 356H x 615W x 381D
- inches: 14H x 24.2W x 15D

**Weight:** 18.2kg (40lbs)

**Construction:** High strength corrosion resistant aluminum

**Finish:** Powdercoat

**Equipment rails:** 19"

**Equipment space:** 2RU for Cordex 650W shelf

**Cable entrance:**
- Top of enclosure: 1 x 3” diameter knock-out; 4 x ¾” knock-out
- Bottom of enclosure: 1 x 3” diameter knock-out; 4 x ¾” knock-out
- Sides of enclosure: 2 x 3” diameter knock-out; 4 x ¾” knock-out

**Hardware**

**Door latch:** Removable front door

**Door lock:** Panel fastener

**HVAC**

**Cooling:** Passive

**Ventilation:** Louvers installed on side of enclosure

**Environmental**

**Temperature:** Operating: 0 to 40°C (0 to 104°F)

**Installation**

**Access:** Full front access

**Maintenance**

No filters used
Bug screen protected on vent openings

**Enclosure Options**

**Mounting:** Wall mount only

**System Specifications**

- 48Vdc Cordex rectifier shelf with DC distribution
- Maximum available power is 500W
- Customer interface to all alarms available on the front

**Agency compliance**

**NEMA rating:** 3R

**CSA:** C22.2 No. 60950-01-03
BATTERY HEATER MATS

Extend Battery Runtime in Cold Weather

- Durable polyester or silicone construction
- Sealed on-mat electronics for maximum protection
- On-mat thermal switch and thermal fuse for redundant safety
- Insulated design directs heat to the batteries not the enclosure for a 30% reduction in power consumption
- Piggyback plug standard on 120V models

All Mats

The main power connector (1) on the heater mat is plugged into an AC source. In low temperature conditions the main control thermistor (2) will allow power to flow to the heater mat coil (5). The thermistor is mounted on the power cord so that it reacts to the battery temperatures and not the mat surface temperature. A secondary thermistor (3) is mounted on the mat with significantly higher temperature settings than the main thermistor (2). This thermistor keeps the mat from overheating during extended run periods. A thermal fuse (4) is a final fail safe device. The power connector (1) has an AC receptacle so that additional mats can be plugged in. Its parallel wiring keeps the failure of the first mat from affecting the operation of others in the string.

Battery heater mats are an integral component in outdoor power solutions and need to be carefully integrated with the other system elements to ensure effective operation.

Please contact your Alpha representative to determine the proper battery heater mat required for your outdoor power system.

<table>
<thead>
<tr>
<th>Line Cord Thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn on Temperature: 5°C (41°F)</td>
</tr>
<tr>
<td>Turn off Temperature: 15°C (59°F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mat Mounted Thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over Temperature Off: 50°C (122°F)</td>
</tr>
<tr>
<td>Turn Back on: 40°C (104°F)</td>
</tr>
<tr>
<td>Thermal Fuse Rating: 85°C (185°F)</td>
</tr>
</tbody>
</table>
Shelters

With the escalating demands for greater coverage and bandwidth, today’s communication networks are placing equipment closer and closer to the end user, often involving remote installations.

Wireless network radios and the systems that keep them powered are often deployed into sites that feature little or no existing infrastructure to house and protect equipment, hence creating a need for a suitable, robust shelter.

“Technical Shelters” are structures designed for housing and protecting electronics and power equipment, commonly used in telecommunication base stations and remote switching centers. Typically designed to be discreet, shelters are built to withstand extreme weather conditions and protect the critical internal communication equipment from vandalism and theft.

Alpha Technologies has the network knowledge, engineering experience and resources to satisfy all of your power and electronic shelter requirements. Whether your next project involves a complex deployment at a remote site, a site upgrade due to expansion or improving protection of the existing electronic equipment, Alpha can work with your requirements, and turn them into a fully working powering site, when and where it’s needed. We offer a broad selection of turnkey services for technical shelter projects:

- Full lifecycle project management
- Site survey and geological testing
- System design and engineering drawings
- Building permits, on-site construction, installation and commissioning
- Shipping and off-loading
- Site completion including landscaping, fencing and security
Choosing the most critical element - Power
Being a recognized leader in power conversion, protection and standby products, Alpha offers complete AC, DC and renewable energy powering solutions to reliably power your application, including complete power plants, distribution and system controllers, batteries, supporting systems/hardware and much more.
• DC Power Systems
• AC Power Systems
• Batteries
• Generators
• Cable Racks
• Climate Control Systems
• Safety and Security
• Solar Systems

Customization
All Alpha shelters feature the ability to be fully customized, providing your critical equipment the ultimate protection in almost all scenarios. Depending on the application, Alpha can provide shelters in a multitude of sizes and form factors (from small pole-mount outdoor enclosures to substantial multi-room shelters), all offering the same standard of technology, functionality, protection and robustness of a larger shelter. Modular designs permit future expansion; where envisaged.

Functionality and Features
Depending on the application and requirements, Alpha has the ability to provide custom shelters that feature:
• Centralized/remote management (multiple alarms for intrusion, fire, fuel leaks)
• Single or multiple rooms
• Rugged outdoor construction withstanding vandalism, break-ins, temperature extremes (sun, snow, ice)
• Fire and earth-quake resistance (fire-rated doors with heavy duty lockset and weather stripping)
• Impact resistance (including bullet proofing)
• Single or redundant climate control systems
• Fully insulated finished interiors—durable, low maintenance and light reflective
• Aesthetically attractive designs feature robust, exterior construction and a multitude of finishes and colors (powder coated, aggregate, wood/metal siding)
• Maintenance-free roof and truss system
• Available in either aluminum or steel construction (or other to suit purpose or budget)
• Optional all-welded assembly: no screws or pop-rivets
• Optional modular designs that allow your shelter to grow with future needs
• NEMA rating if required

At the heart of our technical shelters are Alpha’s industry renowned Cordex® controllers, acting as the central management brain that tightly integrates and monitors performance of power, batteries, alarms, HVAC and other critical elements. Every Alpha controller is designed to be easily accessed through a common website browser.
Our engineers and technicians are experts in power system installation and every customization project adheres to the highest levels of construction standards and safety. Our team has national coverage and a long history of successful turn-key installation projects in telecommunications, including outside plant and shelters.

**Environmental Controls**

Being an ISO 14001:2004 certified company, reducing environmental impact is a standard mindset when designing our shelter solutions. From fuel spill prevention mechanisms, to the use of convection cooling to reduce or even eliminate the need for HVAC, every shelter strives to reach an environmentally friendly balance.

- Alpha’s current portfolio of power solutions conform to RoHS standards and are designed to be highly efficient across a wide temperature range, while occupying less space
- Shelters can feature heavy insulation to minimize temperature fluctuations
- Heat exchangers/hydrionic heating systems reduce HVAC loads
- LED based lighting systems to minimize power consumption
- Specially designed fuel tanks ensure no fuel is wasted, with remote monitoring to alert fast fuel decreases or leaks
- Climate control mechanisms ensure internal temperatures are optimal during hot and cold weather extremes
- Solar power options available

**Accessories**

Should you require them, we have available an extensive set of accessories including:

- Access control
- Video cameras
- Fire suppression systems
- Diesel and propane generators and fuel tanks
- Cable chutes in floor
- Cable ladders
- HVAC systems
- Halo grounding systems
- Double doors

**What's the difference at Alpha?**

Over several decades, Alpha Technologies has established itself as a leader in powering critical devices in communication networks, notably becoming North Americas' most prolific supplier of outside plant cabinets. Our distinctive excellence is the ability to be nimble and respond rapidly to customer needs, delivering solutions that solve their unique powering challenges.

Alpha’s quality management system governs our products portfolio, procedures and processes. Combine this with our operational excellence and continuous improvement programs; we aim to deliver complete customer satisfaction by providing solutions of the highest standard and value.

If your network needs shelter solutions, why look any further than the experts in communications power to supply the right housing for your power and electronic equipment?

Contact us with your specific requirements at **1-800-667-8743** or email **shelters@alpha.ca**

Visit Alpha online at **www.alpha.ca/shelters** for more information.
Batteries

Alpha offers a comprehensive line of AlphaCell™ batteries in a number of formats specifically designed for demanding indoor and outdoor Telecom, Cable, Traffic, Security and Renewable Energy applications. In addition to the AlphaCell™ Gel battery line, Alpha also offers AGM and specialty batteries that support multiple applications while offering extended runtime and warranty options. Excellent heat displacement characteristics have shown Alpha’s Gel cell batteries to exhibit superior working life and reliability. AlphaCell™ GXL, HP and XTV batteries come with a full replacement, non-prorated warranty and provide years of expected life and trouble-free performance.

Choosing Alpha battery technology means 100% out-of-box capacity and reliable performance in harsh operating conditions, longer service life and reduced maintenance. In addition to our battery offerings, Alpha has a full range of accessories to complement your battery installation or testing needs.

Alpha is also able to source other battery solutions for unique applications - contact us with your needs.
Alpha offers batteries for virtually every backup power application. However, not all batteries are listed in the catalog. To help configure the optimal battery solution for your specific application, please review the following questions prior to contacting your Alpha representative.

What is the nature of the application?
• Cycle – batteries will be drained and recharged frequently.
• Float – batteries will only be drained and recharged when the primary power source fails.
• What is the battery backup time requirement?

What are the environmental conditions?
• Will the batteries be installed in a controlled, non-controlled, or partially controlled environment?
• Minimum/maximum ambient temperatures surrounding the batteries?
• Humidity/Precipitation: Will the batteries be exposed to snow, rain, etc?
• Is there adequate ventilation?

Where will the batteries be installed (i.e. what country, city/town)?
• Our battery warranties vary by country of installation; contact Alpha for details.
• What is the expected frequency of utility power failures, e.g. once a year, once a month, etc.?
• How long does the average utility power failure last?
• Is there any government legislation stipulating backup power requirements?

What is the DC voltage requirement?
• 12, 24, 36, 48, 125Vdc or other?

Are there any space restrictions?
• Depending on type of battery, how many, and where the batteries & backup equipment will be installed.
• How convenient is battery replacement?
• Consider total cost of ownership.

Is there an existing battery string?
• When replacing batteries on the same string, ensure date codes, voltage and conductance are matched. AlphaGuard™ is highly recommended to spread the charge voltage equally across all batteries in the string, which optimizes battery life and runtime.

Is fire retardant case a requirement?
• Non FR or UL94-VO.

Are any accessories required?
• E.g. AlphaGuard™ Battery Charge Management System, Battery Heater Mats, Battery Testing Equipment, Battery Spacers, etc.

What warranty/service needs are required?
• Is extended warranty required?
• Special servicing needs?

Note: Replaced batteries require environmentally safe disposal.

Advanced Battery Technologies

Alpha is continuously exploring new, innovative specialty energy storage technologies that help our customers lower their Total Cost of Ownership (TCO). Nickel Cadmium (NiCad) and Lithium Ion (Li-ion) batteries are designed for safety, high reliability, high power density and long design life. NiCad batteries offer a versatile and reliable power source in the most extreme conditions. Li-ion solutions offer optimum power density and low self-discharge rates and are available in a wide range of electrochemical technologies. Contact your Alpha sales representative for advice on which battery technology will best satisfy your requirements.

Comparison of Li-ion Battery Chemistries

<table>
<thead>
<tr>
<th>Li-ion Battery Chemistry</th>
<th>Lithium Cobalt Dioxide (LiCoO₂ or LCO)</th>
<th>Lithium Nickel Cobalt Aluminum Oxide (LiNiCoAlO₂)</th>
<th>Lithium Nickel Manganese Cobalt Oxide (LiNiMnCoO₂ or NMC)</th>
<th>Lithium Manganese Oxide (LiMn₂O₄ or LMO)</th>
<th>Lithium Iron Phosphate (LiFePO₄ or LFP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Wh/kg or L</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>Power</td>
<td>Good</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Low temperature</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Average</td>
</tr>
<tr>
<td>Calendar life</td>
<td>Average</td>
<td>Excellent</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Cycle life</td>
<td>Average</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Safety (cathode only)</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Average</td>
<td>Excellent</td>
</tr>
<tr>
<td>Safety (cathode &amp; anode)</td>
<td>Poorer</td>
<td>Poorer</td>
<td>Poorer</td>
<td>Average</td>
<td>Good</td>
</tr>
<tr>
<td>Cost/kWh</td>
<td>Higher</td>
<td>High</td>
<td>High</td>
<td>Lowest</td>
<td>High</td>
</tr>
</tbody>
</table>
ALPHACELL™ GXL

Gel Top-Terminal Batteries

- High-performance silver alloy for maximum life expectancy
- Longer runtime for demanding outdoor environments
- 100% runtime capacity out-of-box – No cycling required
- Maintenance-free threaded inserts – No periodic retorquing
- Available with 4 and 5 year full warranties*
- Wide operating temperature range

### Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>220 GXL</th>
<th>195GXL</th>
<th>165GXL</th>
<th>85GXL-HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>181-231-10</td>
<td>181-230-10</td>
<td>1810015</td>
<td>181-213-10</td>
</tr>
<tr>
<td>Warranty</td>
<td>4 to 5 years full replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service life</td>
<td>Extended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery type</td>
<td>True gel cell and silver alloy grid battery technologies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat resistant</td>
<td>Extreme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen emission</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity at 20hrs (to 1.75VPC)</td>
<td>109Ah</td>
<td>100Ah</td>
<td>86Ah</td>
<td>50Ah</td>
</tr>
<tr>
<td>Typical runtime**</td>
<td>221 mins</td>
<td>196 mins</td>
<td>165 mins</td>
<td>85 mins</td>
</tr>
<tr>
<td>BCI group size</td>
<td>31</td>
<td>31</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>Terminals</td>
<td>Threaded insert ¼ to 20 UNC</td>
<td>Threaded insert 10-32 UNF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cells per unit</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Voltage per unit</td>
<td>12.8V</td>
<td>12.8V</td>
<td>12.8V</td>
<td>12.8V</td>
</tr>
<tr>
<td>Conductance value</td>
<td>960-1400</td>
<td>880-1320</td>
<td>800-1200</td>
<td>480-720</td>
</tr>
<tr>
<td>Impedance @ 60Hz (Ohms)</td>
<td>0.005</td>
<td>0.005</td>
<td>0.0055</td>
<td>0.0065</td>
</tr>
<tr>
<td>Max. discharge current</td>
<td>900A</td>
<td>900A</td>
<td>800A</td>
<td>600A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>2800A</td>
<td>2600A</td>
<td>2500A</td>
<td>2200A</td>
</tr>
<tr>
<td>10 second volts @ 100A</td>
<td>11.4</td>
<td>11.3</td>
<td>11.2</td>
<td>10.8</td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th>Dimensions w/terminals</th>
<th>mm</th>
<th>inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlphaCell™ GXL</td>
<td>215.4H x 340.9W x 172.7D</td>
<td>8.48H x 13.42W x 6.80D</td>
</tr>
<tr>
<td>Weight</td>
<td>33.2kg (73lbs)</td>
<td>30.5kg (67lbs)</td>
</tr>
<tr>
<td></td>
<td>28.6kg (63lbs)</td>
<td>18kg (39.6lbs)</td>
</tr>
</tbody>
</table>

### Environmental

- Discharge | -40 to 71°C (-40 to 160°F) |
- Charge (with temperature compensation) | -23 to 60°C (-9.4 to 140°F) (Charger temp comp @ ±5mV/C per °C) |
- Float charging voltage | 13.5 to 13.8Vdc |
- AC ripple charger | 0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk |

### Current discharge ratings table in Amps (end voltage 1.75VPC @ 25°C/77°F)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
<th>24</th>
<th>48</th>
<th>72</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>220GXL</td>
<td>67.7</td>
<td>40.4</td>
<td>29.1</td>
<td>22.9</td>
<td>16.1</td>
<td>12.6</td>
<td>10.2</td>
<td>8.7</td>
<td>5.45</td>
<td>4.6</td>
<td>2.4</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>195GXL</td>
<td>65.1</td>
<td>37.4</td>
<td>26.8</td>
<td>21.0</td>
<td>14.8</td>
<td>11.5</td>
<td>9.5</td>
<td>8.0</td>
<td>5.0</td>
<td>4.3</td>
<td>2.2</td>
<td>1.5</td>
<td>1.1</td>
</tr>
<tr>
<td>165GXL</td>
<td>55.9</td>
<td>32.8</td>
<td>23.5</td>
<td>18.4</td>
<td>12.9</td>
<td>10.8</td>
<td>8.2</td>
<td>6.9</td>
<td>4.3</td>
<td>3.7</td>
<td>1.9</td>
<td>1.3</td>
<td>0.9</td>
</tr>
<tr>
<td>85GXL</td>
<td>33.2</td>
<td>18.8</td>
<td>13.3</td>
<td>10.4</td>
<td>7.34</td>
<td>5.70</td>
<td>4.68</td>
<td>3.97</td>
<td>2.50</td>
<td>2.12</td>
<td>1.11</td>
<td>0.76</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. 5 years warranty when purchased in conjunction with AlphaGuard. Consult your salesperson or manual for details. **Runtime calculated using a 25A DC constant current load.
ALPHACELL™ GOLD HP

GOLD-HP GelCell Batteries

› High-performance Silver Alloy for maximum life expectancy
› Longer runtime for demanding outdoor environments
› 100% runtime capacity out-of-box – No cycling required
› Maintenance-free threaded inserts — No periodic retorquing
› Available with 5 and 6 year full warranties
› Wide operating temperature range

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>220 GOLD-HP</th>
<th>195 GOLD-HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>181-233-10</td>
<td>181-232-10</td>
</tr>
<tr>
<td>Warranty</td>
<td>5 to 6 years full replacement</td>
<td></td>
</tr>
<tr>
<td>Service life</td>
<td>Extended</td>
<td></td>
</tr>
<tr>
<td>Battery type</td>
<td>True gel cell and silver alloy grid battery technologies</td>
<td></td>
</tr>
<tr>
<td>Heat resistant</td>
<td>Extreme</td>
<td></td>
</tr>
<tr>
<td>Hydrogen emission</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Capacity at 20hrs (to 1.75VPC)</td>
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<td>100Ah</td>
</tr>
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<td>31</td>
</tr>
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<td>Conductance value</td>
<td>960-1400 Ohms</td>
<td>880-1320 Ohms</td>
</tr>
<tr>
<td>Impedance @ 60Hz (Ohms)</td>
<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
<td>Max. discharge current</td>
<td>900A</td>
<td>900A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>2800A</td>
<td>2600A</td>
</tr>
<tr>
<td>10 second volts @ 100A</td>
<td>11.4</td>
<td>11.3</td>
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Mechanical

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Current discharge ratings table in Amps (end voltage 1.75VPC @ 25°C/77°F)

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<thead>
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<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
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<th>20</th>
<th>24</th>
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<th>72</th>
<th>100</th>
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</thead>
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<tr>
<td>220GXL</td>
<td>67.7</td>
<td>40.4</td>
<td>29.1</td>
<td>22.9</td>
<td>16.1</td>
<td>12.6</td>
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<td>8.7</td>
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<td>4.6</td>
<td>2.4</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>195GXL</td>
<td>65.1</td>
<td>37.4</td>
<td>26.8</td>
<td>21</td>
<td>14.8</td>
<td>11.5</td>
<td>9.5</td>
<td>8</td>
<td>5</td>
<td>4.3</td>
<td>2.2</td>
<td>1.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

1. Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. 6 years warranty when purchased in conjunction with AlphaGuard. Consult your salesperson or manual for details.

**Runtime calculated using a 25A DC constant current load.
ALPHACELL™ AGM

Top Terminal Batteries

- Designed for indoor and outdoor standby applications
- 100% out-of-box runtime capacity
- Maintenance-free threaded inserts
- 100% replacement warranty
- Convenient carrying handle standard on all models

<table>
<thead>
<tr>
<th>Nominal Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td><strong>P/N</strong></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
</tr>
<tr>
<td><strong>Service life</strong></td>
</tr>
<tr>
<td><strong>Sealed VRLA</strong></td>
</tr>
<tr>
<td><strong>Heat resistant</strong></td>
</tr>
<tr>
<td><strong>Hydrogen emission</strong></td>
</tr>
<tr>
<td><strong>Terminals</strong></td>
</tr>
<tr>
<td><strong>Typical runtime</strong></td>
</tr>
<tr>
<td><strong>Cells per unit</strong></td>
</tr>
<tr>
<td><strong>Voltage per unit</strong></td>
</tr>
<tr>
<td><strong>Conductance value</strong></td>
</tr>
<tr>
<td><strong>Max. discharge current</strong></td>
</tr>
<tr>
<td><strong>Short circuit current</strong></td>
</tr>
<tr>
<td><strong>10 Second volts @ 100A</strong></td>
</tr>
<tr>
<td><strong>Impedance @ 60Hz (Ohms)</strong></td>
</tr>
<tr>
<td><strong>Capacity at 20hrs (to 1.75VPC)</strong></td>
</tr>
</tbody>
</table>

**Mechanical**

<table>
<thead>
<tr>
<th>Dimensions w/terminals</th>
<th>mm</th>
<th>203.6H x 260.5W x 173.4D</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>8.02H x 10.26W x 68.3D</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>24.9kg (54.8lbs)</td>
<td></td>
</tr>
</tbody>
</table>

**Environmental**

| Discharge | -40 to 71°C (-40 to 160°F) |
| Charge (with temp compensation) | -23 to 60°C (-9.4 to 140°F) |
| Float charging voltage | 13.5 to 13.8Vdc |
| AC ripple charger | 0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P |

**Current Discharge Ratings Table in Amps (end Voltage 1.75VPC @ 25°C/77°F)**

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>8</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>135 AGM-P</td>
<td>49.0</td>
<td>28.0</td>
<td>15.5</td>
<td>8.63</td>
<td>3.75</td>
</tr>
</tbody>
</table>

1. Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures. Consult your salesperson for details.
2. Runtime calculated using a 25A DC constant current load.
### Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>100XTV</th>
<th>150XTV</th>
<th>195XTV</th>
<th>240XTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810226</td>
<td>1810227</td>
<td>1810228</td>
<td>1810229</td>
</tr>
<tr>
<td>Warranty</td>
<td>5-year full replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature Range (w/ Temperature Compensation)</td>
<td>-40 to 60°C (-40 to 140°F) (charger temperature compensation @ ±3.3mVpc per °C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-10 to 40°C (14 to 104°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Discharge</td>
<td>Battery can be stored up to 12 months at 25°C (77°F). Higher temperatures during storage will require more frequent recharge.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage Per Unit</td>
<td>12V</td>
<td>12V</td>
<td>12V</td>
<td>12V</td>
</tr>
<tr>
<td>Float Charge Voltage</td>
<td>13.5 to 13.8Vdc average per 12V unit at 25°C (77°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refresh/Boost Charging Voltage</td>
<td>14.4 to 15.0Vdc average 12V unit at 25°C (77°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum AC Ripple (Charger)</td>
<td>0.5% RMS or 1.5% of float recommended for best results. Maximum voltage allowed = 4% P/P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal Type</td>
<td>Threaded alloy insert terminal to accept M6 x 12mm bolt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal Hardware Torque</td>
<td>13.6NM / 120in-lbs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Sizes</td>
<td>22NF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Sizes</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Sizes</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Sizes</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Dimensions w/terminals</td>
<td>mm: 207H x 138W x 228D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Dimensions w/terminals</td>
<td>inches: 8.17H x 5.46W x 9.01D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>17.7kg (39lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>25.4kg (56lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>30.5kg (67lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>32kg (75lbs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Runtime Rating 25A (@ 25°C/77°F to 1.75Vpc)</td>
<td>100 minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Amp Hour Capacity 20Hr Rate (@ 25°C/77°F to 1.75Vpc)</td>
<td>56Ah</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Conductance Range Fully Charged New Battery (@ 25°C/77°F)</td>
<td>700 - 800</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Current Discharge Ratings Table in Amps (end Voltage 1.75VPC @ 25°C/77°F)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>100XTV</td>
<td>39.4</td>
<td>22.1</td>
<td>15.8</td>
<td>12.4</td>
<td>10.3</td>
<td>8.7</td>
<td>6.7</td>
<td>5.4</td>
<td>4.6</td>
<td>2.8</td>
</tr>
<tr>
<td>150XTV</td>
<td>53.0</td>
<td>30.6</td>
<td>21.6</td>
<td>16.8</td>
<td>13.9</td>
<td>11.9</td>
<td>9.3</td>
<td>7.7</td>
<td>6.5</td>
<td>4.0</td>
</tr>
<tr>
<td>195XTV</td>
<td>65.5</td>
<td>37.6</td>
<td>26.9</td>
<td>21.0</td>
<td>17.3</td>
<td>14.7</td>
<td>11.3</td>
<td>9.4</td>
<td>7.9</td>
<td>5.0</td>
</tr>
<tr>
<td>230XTV</td>
<td>75.6</td>
<td>42.5</td>
<td>30.3</td>
<td>23.9</td>
<td>19.5</td>
<td>16.5</td>
<td>12.8</td>
<td>10.4</td>
<td>8.8</td>
<td>5.5</td>
</tr>
</tbody>
</table>

1. Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. Consult your salesperson or manual for details.
Pure lead technology provides up to 20% increased life expectancy
3 to 5 times longer shelf life versus standard VRLA batteries
Up to 50% increased runtime in cold climates
Non-spillable UN2800 rating for ease of transportation
Higher runtime allows string count reduction
5-year full, hassle-free warranty

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>3.5HP</th>
<th>4.0HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810077</td>
<td>1810078</td>
</tr>
<tr>
<td>Warranty¹</td>
<td>5-year full replacement</td>
<td></td>
</tr>
<tr>
<td>Service life</td>
<td>Extended</td>
<td></td>
</tr>
<tr>
<td>Battery type</td>
<td>Pure lead AGM</td>
<td></td>
</tr>
<tr>
<td>Heat resistant</td>
<td>Extreme</td>
<td></td>
</tr>
<tr>
<td>Hydrogen emission</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Capacity at 20hrs (to 1.75VPC)</td>
<td>104Ah</td>
<td>114Ah</td>
</tr>
<tr>
<td>Typical runtime²</td>
<td>210 mins</td>
<td>240 mins</td>
</tr>
<tr>
<td>BCI group size</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Terminals</td>
<td>Threaded insert 1/4 - 20 UNC&quot;</td>
<td></td>
</tr>
<tr>
<td>Cells per unit</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Voltage per unit</td>
<td>12.8</td>
<td></td>
</tr>
<tr>
<td>Conductance value</td>
<td>1400-1850</td>
<td>1700-2500</td>
</tr>
<tr>
<td>Max. discharge current</td>
<td>800A</td>
<td>900A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>2800A</td>
<td>3200A</td>
</tr>
<tr>
<td>10 second volts @ 100A</td>
<td>11.7</td>
<td>11.8</td>
</tr>
<tr>
<td>Impedance @ 60Hz (Ohms)</td>
<td>2.7</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Mechanical

| Dimensions w/terminals | mm | 223.5H x 337.8W x 172.7D | 223.5H x 337.8W x 172.7D |
| inches | 8.5H x 13.4W x 6.8D | 8.5H x 13.4W x 6.8D |
| Weight | 30.8kg (68lbs) | 35.6kg (74lbs) |

Environmental

| Discharge | -40 to 60°C (-40 to 140°F) |
| Charge (with temperature compensation) | -40 to 60°C (-9.4 to 140°F) |
| Float charging voltage | 13.5 to 13.8Vdc (Charger temp comp @ ±4mV/C per °C) |
| AC ripple charger | 0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk |

Current Discharge Ratings Table in Amps (end Voltage 1.75VPC @ 25°C/77°F)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>8</th>
<th>10</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5HP</td>
<td>End voltage 1.75VPC:</td>
<td>70.2</td>
<td>40.3</td>
<td>28.6</td>
<td>22.3</td>
<td>12.1</td>
<td>9.9</td>
</tr>
<tr>
<td></td>
<td>End voltage 1.70VPC:</td>
<td>72.0</td>
<td>41.1</td>
<td>29.2</td>
<td>22.7</td>
<td>12.3</td>
<td>10.0</td>
</tr>
<tr>
<td>4.0HP</td>
<td>End voltage 1.75VPC:</td>
<td>81.9</td>
<td>45.8</td>
<td>32.2</td>
<td>25.0</td>
<td>13.1</td>
<td>10.6</td>
</tr>
<tr>
<td></td>
<td>End voltage 1.70VPC:</td>
<td>83.7</td>
<td>46.7</td>
<td>32.8</td>
<td>25.4</td>
<td>13.3</td>
<td>10.7</td>
</tr>
</tbody>
</table>

¹ Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. Consult your salesperson or manual for details.
² Runtime calculated using a 25A DC constant current load to 1.75Vdc @ 25°C
ALPHACELL™ FT

Gel Front-Terminal Batteries

- True gel technology and high performance separator for extended battery cycle life
- Front access design with protective covers for ease of installation and maintenance
- Ideal for demanding outdoor Telecom, Wi-Fi and Broadband applications

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>195 GXL-FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810029</td>
</tr>
<tr>
<td>Service life</td>
<td>Extended warranty - 3 year full replacement¹</td>
</tr>
<tr>
<td>Sealed VRLA</td>
<td>Valve regulated lead acid</td>
</tr>
<tr>
<td>Heat resistant</td>
<td>Extreme</td>
</tr>
<tr>
<td>Hydrogen emission</td>
<td>Low</td>
</tr>
<tr>
<td>Terminals</td>
<td>16mm insert M6 thread</td>
</tr>
<tr>
<td>Typical runtime</td>
<td>195 mins</td>
</tr>
<tr>
<td>Cells per unit</td>
<td>6</td>
</tr>
<tr>
<td>Voltage per unit</td>
<td>12.8V</td>
</tr>
<tr>
<td>Conductance value</td>
<td>800-1200</td>
</tr>
<tr>
<td>Max. discharge current</td>
<td>400A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>3000A</td>
</tr>
<tr>
<td>10 Second volts @ 100A</td>
<td>10.8</td>
</tr>
<tr>
<td>Impedance @ 60Hz (Ohms)</td>
<td>0.0041</td>
</tr>
<tr>
<td>Capacity at 20hrs (to 1.75VPC)</td>
<td>110Ah</td>
</tr>
</tbody>
</table>

Mechanical

- Dimensions w/terminals: mm 285H x 110W x 395D, inches 11.2H x 4.3W x 15.5D
- Weight: 34.5kg (76.3lbs)

Environmental

- Discharge: -40 to 71°C (-40 to 160°F)
- Charge (with temp compensation): -20 to 50°C (-4 to 122°F) (Charger temp comp @ ±4mV/C per °C)
- Float charging voltage (Vdc): Float 2.27 to 2.30VPC @ 25°C cycling 2.35VPC @ 25°C
- AC ripple charger: 0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P

Current Discharge Ratings Table in Amps (End Voltage 1.75VPC @ 25°C/77°)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
<th>24</th>
<th>48</th>
<th>72</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>195 GXL-FT</td>
<td>69.2</td>
<td>38.0</td>
<td>26.8</td>
<td>21.1</td>
<td>15.2</td>
<td>12.0</td>
<td>9.92</td>
<td>8.48</td>
<td>5.50</td>
<td>4.60</td>
<td>2.31</td>
<td>1.56</td>
<td>1.13</td>
</tr>
</tbody>
</table>

1. Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. Consult your salesperson or manual for details.
ALPHACELL™ BT

Broadband/Telecom VLRA Battery Series

- Front access terminal battery for Broadband/Telecom applications
- Long life alloy design
- Reduced headspace requirement provides higher energy density in cabinet or rack applications
- Removable handles for ease of installation
- Thermally welded case-to-cover bond ensures a leak-proof seal

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AlphaCell 160 BT</th>
<th>AlphaCell 180 BT</th>
<th>AlphaCell 210 BT</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810119</td>
<td>1810120</td>
<td>1810154</td>
</tr>
<tr>
<td>Warranty</td>
<td>4 years full replacement then 6 years prorated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>12V</td>
<td>12V</td>
<td>12V</td>
</tr>
<tr>
<td>Ampere hour capacity 8hr rate @ 25°C (77°F) to 1.75 Vc</td>
<td>157Ah</td>
<td>181Ah</td>
<td>202Ah</td>
</tr>
<tr>
<td>Ampere hour capacity 10hr rate @ 25°C (77°F) to 1.75 Vc</td>
<td>161Ah</td>
<td>186Ah</td>
<td>209Ah</td>
</tr>
<tr>
<td>Maximum discharge current</td>
<td>800A</td>
<td>800A</td>
<td>800A</td>
</tr>
<tr>
<td>Short circuit current</td>
<td>4,700A</td>
<td>4,500A</td>
<td>4,500A</td>
</tr>
<tr>
<td>Ohms impedance 60Hz (Ω)</td>
<td>0.0031 Ohms</td>
<td>0.0037 Ohms</td>
<td>0.0040 Ohms</td>
</tr>
</tbody>
</table>

Self discharge: Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.

Equalize charge and cycle service voltage: 14.40 to 14.80Vdc average per 12V unit @ 25°C (77°F)

Terminal: Inserted interunit connector provided

Terminal hardware initial torque: 110 in. lbs. (12.4 Nm)

Mechanical

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm</th>
<th>inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>283H x 559D x 126W</td>
<td>11H x 22D x 5W</td>
</tr>
<tr>
<td></td>
<td>320H x 559D x 126W</td>
<td>13H x 22D x 5W</td>
</tr>
<tr>
<td></td>
<td>320H x 559D x 126W</td>
<td>13H x 22D x 5W</td>
</tr>
<tr>
<td>Weight</td>
<td>52.2kg (115lbs)</td>
<td>59.4kg (131lbs)</td>
</tr>
<tr>
<td></td>
<td>63.51kg (142lbs)</td>
<td></td>
</tr>
</tbody>
</table>

Environmental

Operating temperature range (with temperature compensation): Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)

Nominal operating temperature range: 23 to 27°C (74 to 80°F)

Recommended maximum charging current limit: C/5 amperes (20hr rate)

Float charging voltage: 13.5 to 13.8Vdc average per 12V unit (Charger temp comp @ ±5mV/C per °C)

Maximum AC ripple (charger): 0.5% RMS or 1.5% of float charge voltage recommended for best results. Max voltage allowed = 4% P-P

Current Discharge Ratings Table in Amps (End Voltage 1.75VPC @ 25°C/77°)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlphaCell 160 BT</td>
<td>107.1</td>
<td>62.2</td>
<td>44.9</td>
<td>35.4</td>
<td>29.3</td>
<td>25.1</td>
<td>22.0</td>
<td>19.7</td>
<td>16.1</td>
<td>13.7</td>
<td>8.6</td>
<td>7.3</td>
</tr>
<tr>
<td>AlphaCell 180 BT</td>
<td>123.1</td>
<td>71.1</td>
<td>51.7</td>
<td>40.8</td>
<td>33.8</td>
<td>29.0</td>
<td>25.4</td>
<td>22.6</td>
<td>18.6</td>
<td>15.9</td>
<td>10.0</td>
<td>8.5</td>
</tr>
<tr>
<td>AlphaCell 210 BT</td>
<td>138.0</td>
<td>82.7</td>
<td>58.4</td>
<td>45.8</td>
<td>37.9</td>
<td>32.3</td>
<td>28.4</td>
<td>25.3</td>
<td>20.9</td>
<td>17.8</td>
<td>11.5</td>
<td>9.8</td>
</tr>
</tbody>
</table>

1. Warranty in US/Canada only for other regions consult your salesperson for details.
ALPHACELL HR

High Rate UPS Standby Power Applications

- Front access threaded copper alloy inserts for reduced maintenance and increased safety
- Front terminal design maximizes energy density with direct connect extrusion fusion weld technology
- Reduced headspace promotes higher energy density in cabinet or rack applications
- Removable handles for easy installation
- Thermally welded case-to-cover bond to ensure a leak-proof seal

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AlphaCell 700 HR</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810118</td>
</tr>
<tr>
<td>Warranty</td>
<td>3 years</td>
</tr>
<tr>
<td>Voltage per unit</td>
<td>12Vdc</td>
</tr>
<tr>
<td>Maximum terminal discharge current rating (Amps)</td>
<td>800</td>
</tr>
</tbody>
</table>

Self discharge

Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.

Equalize charge and cycle service voltage

14.40 to 14.80 Vdc average per 12V unit @ 25°C (77°F)

Terminal: Inserted - Inter-unit connector provided

Threaded copper alloy insert terminal to accept ¼”-20 UNC bolt

Terminal hardware initial torque

110 in.-lbs. (12.4 N-m)

Mechanical

Dimensions

mm: 320.04H x 559.05D x 125.73W
Inches: 12.60H x 22.01D x 4.95W

Weight

60kg (131lbs)

Environmental

Operating temp range with temp compensation

Discharge: -40 to 71°C (-40 to +160°F)
Charge: 60 to -23°C (-10 to +140°F)

Nominal operating temp range

23 to 27°C (+74 to +80°F)

Recommended maximum charging current limit

C/5 amperes @ 20 Hr rate

Float charging voltage

13.5 to 13.8 Vdc average per 12V unit @ 25°C (77°F)

Maximum AC ripple (charger)

0.5% RMS or 1.5% P-P of float charge voltage recommended for best results. Max voltage allowed = 1.4% RMS (4% P-P) Max current allowed = C/20

Current Discharge Ratings Table in Amps (End Voltage 1.75VPC @ 25°C/77°)

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
<th>24</th>
<th>72</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.85</td>
<td>105</td>
<td>66.1</td>
<td>48.8</td>
<td>32.5</td>
<td>21.9</td>
<td>18.1</td>
<td>15.4</td>
<td>9.67</td>
<td>8.16</td>
<td>2.60</td>
</tr>
<tr>
<td>1.80</td>
<td>116</td>
<td>70.4</td>
<td>51.7</td>
<td>34.4</td>
<td>23.1</td>
<td>19.0</td>
<td>16.2</td>
<td>10.1</td>
<td>8.54</td>
<td>2.70</td>
</tr>
<tr>
<td>1.75</td>
<td>124</td>
<td>74.0</td>
<td>53.8</td>
<td>35.5</td>
<td>23.7</td>
<td>19.5</td>
<td>16.5</td>
<td>10.3</td>
<td>8.70</td>
<td>2.80</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice

Constant Power Discharge Ratings - Watts Per Cell @ 77°F (25°C)

<table>
<thead>
<tr>
<th>Operating Time to End Point Voltage (in minutes)</th>
<th>End Point Volts/Cell</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td>1.75</td>
<td>821.1</td>
</tr>
<tr>
<td>1.70</td>
<td>961.5</td>
</tr>
<tr>
<td>1.67</td>
<td>1058.8</td>
</tr>
<tr>
<td>1.65</td>
<td>1075.6</td>
</tr>
<tr>
<td>1.60</td>
<td>1097.4</td>
</tr>
</tbody>
</table>

1. Warranty in US/Canada only for other regions consult your salesperson for details.
Top Terminal Renewable Energy Applications

- Deep cycle battery designed for renewable energy applications
- Robust lead alloy plates for extended cycle life and low calcium grid alloy for reduced gas emissions and ease of recycling
- Flame-arresting, one-way pressure-relief vent for safety and long life
- UL-recognized component

### Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AlphaCell 34 RE</th>
<th>AlphaCell 52 RE</th>
<th>AlphaCell 78 RE</th>
<th>AlphaCell 95 RE</th>
<th>AlphaCell 106 RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810252</td>
<td>1810248</td>
<td>1810253</td>
<td>1810254</td>
<td>1810164</td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage per unit</td>
<td>12.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrolyte</td>
<td>Absorbed H2SO4' SG=1.300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Self discharge**

Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require a recharge sooner than batteries stored at lower temperatures.

**Terminal**

- Inserted Terminal (Copper Alloy)
- 10-32 UNF bolt (AlphaCell 34 RE, 52 RE)
- ¼-20 UNC bolt (AlphaCell 78 RE, 95 RE, 106 RE)

**Terminal hardware initial torque**

- 30 in.-lbs (3.4 N-m) (AlphaCell 34 RE, 52 RE)
- 110 in.-lbs (12.4 N-m) (AlphaCell 78 RE, 95 RE, 106 RE)

**Mechanical**

<table>
<thead>
<tr>
<th>Dimensions (H x W x D)</th>
<th>mm</th>
<th>inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlphaCell 34 RE</td>
<td>172.7 x 131.9 x 197.1</td>
<td>6.80 x 5.19 x 7.76</td>
</tr>
<tr>
<td>AlphaCell 52 RE</td>
<td>205.1 x 139.2 x 228.6</td>
<td>8.07 x 5.48 x 9.0</td>
</tr>
<tr>
<td>AlphaCell 78 RE</td>
<td>203.5 x 173.4 x 273.2</td>
<td>8.01 x 6.83 x 10.76</td>
</tr>
<tr>
<td>AlphaCell 95 RE</td>
<td>204.8 x 173.4 x 317.8</td>
<td>8.06 x 6.83 x 12.51</td>
</tr>
<tr>
<td>AlphaCell 106 RE</td>
<td>216.4 x 172.7 x 340.9</td>
<td>8.52 x 6.80 x 13.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>12kg (27lbs)</td>
</tr>
</tbody>
</table>

**Environmental**

- Operating temperature range (with temperature compensation)
  - Discharge: -40 to +71°C (-40 to +160°F)
  - Charge: -23 to +60°C (-10 to +140°F)

- Normal operating temperature range +20 to +27°C (+68 to +80°F)

- Recommended maximum charge current limit C/5 amperes @ 20hr rate

- Float charge voltage 13.5 to 13.8 Vdc/unit Average at 25°C (77°F)

**Equalization and cycle service charging and current limits**

- 14.4 to 14.8 Vdc/unit Average at 25°C (77°F)

**Current Discharge Ratings Table in Amps (End Voltage 1.75VPC @ 25°C/77°)**

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>20</th>
<th>24</th>
<th>72</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>AlphaCell 34 RE</td>
<td>19.70</td>
<td>11.80</td>
<td>8.70</td>
<td>7.00</td>
<td>5.80</td>
<td>4.93</td>
<td>4.30</td>
<td>3.80</td>
<td>3.11</td>
<td>2.64</td>
<td>1.65</td>
<td>1.38</td>
<td>0.47</td>
<td>0.34</td>
</tr>
<tr>
<td>AlphaCell 52 RE</td>
<td>29.60</td>
<td>17.55</td>
<td>12.97</td>
<td>10.35</td>
<td>8.66</td>
<td>7.43</td>
<td>6.49</td>
<td>5.75</td>
<td>4.72</td>
<td>4.00</td>
<td>2.50</td>
<td>2.10</td>
<td>0.72</td>
<td>0.52</td>
</tr>
<tr>
<td>AlphaCell 78 RE</td>
<td>43.50</td>
<td>26.60</td>
<td>19.50</td>
<td>15.50</td>
<td>12.90</td>
<td>11.10</td>
<td>9.80</td>
<td>8.70</td>
<td>7.10</td>
<td>6.00</td>
<td>3.75</td>
<td>3.15</td>
<td>1.08</td>
<td>0.78</td>
</tr>
<tr>
<td>AlphaCell 95 RE</td>
<td>47.00</td>
<td>29.00</td>
<td>22.00</td>
<td>17.70</td>
<td>14.80</td>
<td>12.70</td>
<td>11.14</td>
<td>9.90</td>
<td>8.17</td>
<td>6.97</td>
<td>4.40</td>
<td>3.70</td>
<td>1.29</td>
<td>0.95</td>
</tr>
<tr>
<td>AlphaCell 106 RE</td>
<td>49.20</td>
<td>30.75</td>
<td>23.33</td>
<td>19.00</td>
<td>16.12</td>
<td>14.00</td>
<td>12.40</td>
<td>11.13</td>
<td>9.20</td>
<td>7.85</td>
<td>5.00</td>
<td>4.21</td>
<td>1.44</td>
<td>1.06</td>
</tr>
</tbody>
</table>

1. Warranty in US/Canada only for other regions consult your salesperson for details.
ENERGYCELL RE FRONT TERMINAL

Front Terminal Renewable Energy Applications

- Front Terminal Access Design for ease of maintenance and installation
- High-density pasted plates for high cycle life
- Lead-calcium-tin alloy plates for long life in both cycling and float applications
- High recharge efficiency
- Compact footprint for higher energy density requirements
- Thermally welded case-to-cover bond to eliminate leakage
- UL-recognized component

Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>EnergyCell 170RE</th>
<th>EnergyCell 200RE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>1810255</td>
<td>1810137</td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
<td>2 years</td>
</tr>
<tr>
<td>Voltage Per Unit</td>
<td>12 Vdc</td>
<td>12 Vdc</td>
</tr>
<tr>
<td>Self Discharge</td>
<td>Battery can be stored up to 18 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.</td>
<td></td>
</tr>
<tr>
<td>Temp Compensation Factor (Charging)</td>
<td>±5mV per °C per cell (2V)</td>
<td></td>
</tr>
<tr>
<td>Terminal Hardware Initial Torque</td>
<td>110 in-lbs (12.4 Nm)</td>
<td></td>
</tr>
<tr>
<td>Terminal</td>
<td>Threaded copper alloy insert terminal to accept ¼&quot;-20 UNC bolt</td>
<td></td>
</tr>
<tr>
<td>Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions*</td>
<td>mm</td>
<td>inches</td>
</tr>
<tr>
<td></td>
<td>283H x 559D x 126W</td>
<td>11.14H x 22.01D x 4.95W</td>
</tr>
<tr>
<td></td>
<td>320 x 5509 x 126</td>
<td>12.60 x 22.01 x 4.95</td>
</tr>
<tr>
<td>Weight</td>
<td>52kg (115lbs)</td>
<td>60kg (131lbs)</td>
</tr>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>Discharge: -40 to 71°C (-40 to 160°F)</td>
<td></td>
</tr>
<tr>
<td>(with temperature compensation)</td>
<td>Charge: -23 to 60°C (-10 to 140°F)</td>
<td></td>
</tr>
<tr>
<td>Optimal Operating Temp Range</td>
<td>23 to 27°C (74 to 80°F)</td>
<td></td>
</tr>
<tr>
<td>Recommended Maximum Charging Current Limit Per String</td>
<td>25 Amps DC</td>
<td></td>
</tr>
<tr>
<td>Empty Charge Voltage</td>
<td>13.62 Vdc/unit average at 25°C (77°F)</td>
<td></td>
</tr>
<tr>
<td>Equalization and Cycle Service Charging Limits</td>
<td>14.4 Vdc/unit average at 25°C (77°F)</td>
<td></td>
</tr>
<tr>
<td>Current Discharge Ratings Table in Amps (End Voltage 1.75VPC @ 25°C/77°F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>EnergyCell 170RE</td>
<td>89.1</td>
<td>38</td>
</tr>
<tr>
<td>EnergyCell 200RE</td>
<td>103</td>
<td>44</td>
</tr>
</tbody>
</table>

1. Warranty in US/Canada only for other regions consult your salesperson for details.
## UPS BATTERIES

### 7 to 34AH

- High rate and general purpose VRLA Batteries
- 12V batteries with capacities from 7Ah to 34Ah at 20 hrs
- Optimized grid for high power density
- Upright, side or end mounting
- Thermally welded case to cover bond eliminates leakage
- Optional flame retardant ABS casing to UL94-VO

### Nominal Specifications

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Valve regulated lead acid</td>
</tr>
<tr>
<td>Range of capacity</td>
<td>7 to 34Ah</td>
</tr>
<tr>
<td>Recommended float voltage</td>
<td>13.5Vdc @ 20°C (68°F)</td>
</tr>
<tr>
<td>Terminal type</td>
<td>Threaded copper insert or fast on (vary by battery Ah)</td>
</tr>
<tr>
<td>Optional</td>
<td>UL 94 VO flame retardants casing</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
</tr>
<tr>
<td>Operating temperature nominal</td>
<td>25°C (77°F) note: can operate at higher temperature up to 74°C (165°F) but degrades life of battery</td>
</tr>
<tr>
<td>Operating temperature range (Extended temperature batteries)</td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td>-20 to 50°C (-4 to 122°F)</td>
</tr>
<tr>
<td>Charge</td>
<td>-20 to 50°C (-4 to 122°F)</td>
</tr>
<tr>
<td>Storage</td>
<td>-20 to 50°C (-4 to 122°F)</td>
</tr>
</tbody>
</table>

*For information on warranties please contact your sales rep.*
Intelligent site controller monitors up to 6 strings of 40 batteries (2V or 12V cells)
Monitors string and cell voltage, admittance, cell temperature, ripple current and float current
Expand site monitoring capabilities via external analog and digital inputs and alarm relay outputs
Predictive measurements and sophisticated data logging for comprehensive battery health indication
Advanced local and remote monitoring options including SNMP over TCP/IP

**Electrical**

**Site controller unit:**
Sensors: 20-60Vdc
Power consumption: 5W @ 20-60Vdc plus 5W
  (If 12V source used at max load)

**Sensors:**
Voltage:
- 2V: 1.65-3.0Vdc
- 12V: 8.0-16Vdc

Power consumption:
- 2V: <15ma nominal, 2/5A during admittance test
- 12V: <15ma nominal, 5/7A during admittance test

**Rim modules:**
AC line measurement: 90 to 140Vac, RMS, Sine, 50/60Hz

**Environmental**

**Site controller unit:**
Operation: -45 to 65°C

**Sensors:**
Operating range:
- 2V: -40 to 80°C
- 12V: -40 to 80°C

Heat dissipation: <94 BTU per hour

**Communications**

**Site controller unit:**
SNMP via TCP/IP
USB (X4)

**Sensors:**
Communications Interface:
- 2V: Optically isolated RJ-45 (1200V)
- 12V: Optically isolated RJ-45 (1200V)

**Mechanical**

**Sensors (2V)**
Battery Interface
Battery positive: Ring terminal with 12" wire
Battery negative: Bracket or ring terminal with 12" wire

**Rim Modules**
Dimensions:
mm: 68.6H x 81.3W x 25D
inches: 2.7H x 3.2W x 1D
Weight: 0.11kg (0.25lbs)
What pieces make up the system

1. Intelligent Site Controller
The site controller communicates with each of the sensors and collects the most recent measurement data. It checks each measurement against locally stored alarm thresholds and alerts the user’s monitoring software if an abnormality occurs. The site controller is fully Ethernet TCP/IP compatible, and has a built-in web server and SNMP interface.

2. Battery Sensors
Battery sensors are connected to the terminal posts of each battery cell or block in the system. The sensors measure the battery’s admittance (internal resistance), voltage, and post temperature.

3. Current Sensors
Float current sensors are available for monitoring charging currents as low as 20mA and also provide ripple current measurements. A discharge monitoring sensor is also available for DC currents up to 500A with a 1A resolution.

4. RIM/ROM Modules
RIM/ROM modules expand the system capabilities beyond just battery monitoring to integrate complete facilities, HVAC, and security monitoring. RIM modules provide up to six analog or digital inputs. ROM modules provide four remotely controllable output relay contacts.

Key System Features

- Enterprise Class system designed to manage thousands of batteries from a single console using open standard interfaces
- Automated, consistent, continuous measurement data thereby dramatically increasing the reliability of measurements and making historic trending simple
- Intelligent equalization which balances float charging across battery cells reducing or eliminating gassing or sulphation caused by unequal charge on batteries
- Holistic approach to monitoring including voltages, ohmic measurements, individual cell temperatures, ripple current, float current, etc.
- Facilities and environmental monitoring options
- Data logging of parameter data and discharge events (number, depth, duration, and cell performance)

Software and Monitoring Options

1. Integrated Site Controller Access
The site controller’s internal web interface provides information for all components connected to the Site Controller.

2. Lookout™ Software
Lookout™ Software provides a global view of multiple installations with the ability to “drill in” to details. Lookout™ is provided at no charge.

3. Continuity SBL
Continuity SBL enterprise-class battery system monitoring and analysis package provides predictive trending information and can manage thousands of battery sites.

4. 3rd Party NMS/EMS Systems
Any software that supports an SNMP interface.
**AlphaGuard™ Battery Charge Management System**

AG-CMT-3 AlphaGuard™ Charge Management SC, 36V String – including Battery interface cable
AG-CMT-4 AlphaGuard™ Charge Management SC, 48V String – including Battery interface cable

The AlphaGuard is a battery charge management system that monitors and protects your batteries for runtime optimization and longer battery life. CSA and UL approved, AlphaGuard allows you to replace single batteries rather than the whole string. It spreads charge voltage equally across batteries to maximize battery life and compensates for battery differences as they age.

Also available: AlphaGuard Potted Version for Below Grade Applications.

The potted version is ideal for applications where batteries are installed underground or subject to damp conditions or possible immersion.

*Note: For some applications, Alpha offers an extended battery warranty when AlphaGuard is used.*

Contact your Alpha representative for complete details.

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**Battery Testing Equipment**

Alpha’s battery testing equipment provides accurate information about the status of installed standby batteries allowing you to budget for early detection of failed or degraded batteries and for replacements with confidence.

A fast, reliable and affordable testing process.

Conductance testing, coupled with a simple utility load test, arms the operator with the quality of data necessary to know the status of installed standby batteries, allowing for detection and replacement before failure occurs and puts backup during an outage at risk.

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**Battery Spacer Clip**

- Designed for use with most group 27 (165GXL) or 31 (3.5HP, 4.0HP, 195GXL, 220GXL) VRLA batteries
- Easy to install - 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
Generators

Alpha’s line of generators provide extended runtime for critical loads, while minimizing the amount of battery backup required at the site. Every generator system incorporates efficient, effective and reliable power technology, including: natural gas or propane powered generators, exclusive audible noise baffling, remote status monitoring features and multiple built-in safeguards to protect the system, operators and the public.

AlphaGen™ DC generator systems are specifically designed for outside plant communication networks requiring -48Vdc power. They offer quiet operation and low profile for a discreet presence in populated areas.
ALPHAGEN™ PORTABLE

3.0kW Portable 36/48Vdc Generator System

- DC technology requires no UATS (Universal Automatic Transfer Switch)
- No need to disconnect or reconnect power supply to utility power
- Selectable output for 36 or 48Vdc operation up to 3000W
- Quiet operation only 58dBA @ 7m (22ft)
- Completely enclosed, water resistant for safe operation in the field
- Oversized metal gas tank with level gauge for extended runtimes of up to 20 hrs

**P/N: 041-028-10**

Performance / Features

**Engine:**
- Honda GX 200 6.5hp, air-cooled, OHV, single cylinder, manual recoil starting, manual choke
- **Rated power:** 2800W continuous, 3000W max

**Alternator:**
- Permanent magnet, brushless, bearingless

**Dual range selector:**
- 36V: 39.5Vdc nominal at generator output connector
- 48V: 52.5Vdc nominal at generator output connector

**Output regulation:** 1Vdc

**Control features:**
- Automatic voltage regulation
- Electronic governor
- Over current protection
- Analog voltmeter with back light

**Cable interface:**
- Anderson type SBE-80 connector

**Fuel tank:**
- 3.4 gallon metal tank with level gauge

**Runtime:**
- @ 25% load: 20hrs
- @ 80% load: 10hrs
- @ 100% load: 7.2hrs

**Audible noise:** Approx. 58dBA @ 7m under full load

**Frame:** Fully enclosed

**Mechanical**

**Dimensions:**
- mm: 569H x 480W x 655D
- inches: 22.4H x 18.9W x 25.8D
- **Dry weight:** Less than 53.5kg (118lbs)

**3.0kW Portable Generator Sound Levels**

Ambient background noise level at 45dBA
All readings are 8 point averages

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**Required Accessories**

- Output interface cable: Available in 10', 30' or 50' lengths
- Battery interface cable: Choose ring lung, heavy-duty alligator clamp, or Y-adapter*

  *Connects the power supply’s battery input directly to the generator

**Optional accessories:**

- **DCX-PG-WK:** Portable generator wheel kit
- **AG-PG-TOOL:** Punch tool kit for enclosures
- **AG-PG-UK:** Enclosure upgrade kit
- **DCX-PG-HANDLE:** Locking handle
- **AG-CAB-KIT:** Cable bag with cable and key lanyard

**Agency Compliance**

CSA C22.2 No. 100-95, 107.1-01,107.2-M89, 0.4 FCC part 15B Class A
## Nominal Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AlphaGen DCX 2000</th>
<th>AlphaGen ACX 2000i</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lightweight portable DC generator for powering 36Vdc loads</td>
<td>Lightweight portable AC generator for powering 120Vac loads</td>
</tr>
<tr>
<td></td>
<td>Large 1.7 gallon (6.4L) fuel tank for longer runtime</td>
<td>1.4 gallon (5.3L) fuel tank</td>
</tr>
<tr>
<td></td>
<td>Requires no Automatic Transfer Switch(ATS)</td>
<td>Inverter equipped for clean AC power</td>
</tr>
<tr>
<td></td>
<td>No need to disconnect or reconnect power supply to utility power</td>
<td>Limited 12Vdc output</td>
</tr>
<tr>
<td></td>
<td>Quiet operation, less than 71 dBA at 7m (22ft)</td>
<td>Fuel economy switch</td>
</tr>
<tr>
<td></td>
<td>Capable of parallel operation with other DCX2000 units</td>
<td>Quiet operation, less than 67 dBA at 7m (22ft)</td>
</tr>
<tr>
<td><strong>Engine Type</strong></td>
<td>4 stroke, OHV, single cylinder, air cooled, manual choke</td>
<td>4 stroke, OHV, single cylinder, air cooled, manual choke</td>
</tr>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>36Vdc</td>
<td>120Vac</td>
</tr>
<tr>
<td><strong>12VDC Output</strong></td>
<td>No</td>
<td>12Vdc to 8.3A</td>
</tr>
<tr>
<td><strong>Rated Power</strong></td>
<td>2,000W continuous, 2,200W maximum</td>
<td>1,900W continuous, 2,000W maximum</td>
</tr>
<tr>
<td><strong>Rated Current</strong></td>
<td>50A</td>
<td>15.8</td>
</tr>
<tr>
<td><strong>Rated Frequency</strong></td>
<td>-</td>
<td>60Hz</td>
</tr>
<tr>
<td><strong>Output Connector</strong></td>
<td>Anderson type SBE-80 connector</td>
<td>1 x 120Vac, 20A 5020R Duplex</td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td>Unlead Gasoline</td>
<td>Unlead Gasoline</td>
</tr>
<tr>
<td><strong>Tank Capacity</strong></td>
<td>1.7gal (6.5L)</td>
<td>1.4gal (5.3L)</td>
</tr>
<tr>
<td><strong>Dry Weight</strong></td>
<td>28kg (62lbs)</td>
<td>28kg (62lbs)</td>
</tr>
<tr>
<td><strong>Weight w/Fuel</strong></td>
<td>36.2kg (80lbs)</td>
<td>36.2kg (80lbs)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>545L x 290W x 500H</td>
<td>559L x 279.4W x 482.6H</td>
</tr>
<tr>
<td><strong>Audible Noise db</strong></td>
<td>60 to 70dBA @7m</td>
<td>56 to 66dBA @7m</td>
</tr>
<tr>
<td><strong>Certification</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Runtime @ 50% Load</strong></td>
<td>6.3hrs</td>
<td>3.0hrs</td>
</tr>
<tr>
<td><strong>Runtime @ 100% Load</strong></td>
<td>5.0hrs</td>
<td>7.50hrs</td>
</tr>
<tr>
<td><strong>Required Accessories</strong></td>
<td></td>
<td><strong>Included Accessories</strong></td>
</tr>
<tr>
<td>Output Interface Cable:</td>
<td>10’, 30’, 50’</td>
<td>Oil Jug</td>
</tr>
<tr>
<td>Battery Interface Cable (choose one):</td>
<td>Ring Lug Battery Interface</td>
<td>Spare Spark Plug</td>
</tr>
<tr>
<td></td>
<td>Alligator Clamp Battery Interface</td>
<td>Manual</td>
</tr>
<tr>
<td></td>
<td>Y-Adaptor*</td>
<td>12V Charge Cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spark Plug Wrench &amp; Handle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oil Drain Extension</td>
</tr>
</tbody>
</table>

* Connects the power supply’s battery input directly to the generator
7.5kW options in either 36Vdc or 48Vdc configurations
Cost effective extended runtime solution for Telecom powering applications
Quiet operation, small size and low profile allow for easier installation in populated areas
Eliminates large quantities of batteries otherwise required for extended runtime
Designed for stand-alone or collocated powernode applications
Built-in safeguards to protect the system, operators and the public
Safe unattended operation designed to UL2200, NFPA 37, 54, 58 and 70 standards

Consult your Alpha representative for P/N configurations

Nominal Specifications

Model: .................. 7.5kW
DC output voltage: ........... 52.0V ±0.5V @ no load 48V configuration
104.0V ±0.5V @ no load 96V configuration
DC output load regulation: .0.5V
Output current: .............. 52.0V @ 144A max
104V @ 72A max
Engine: ................... 624CC, Air cooled, Twin OHV 15hp
(using natural gas fuel)
RPM: (variable speed): ....... 2800 to 3600RPM

Acoustical noise
dba 10' @ 100% rated load: ... 70.3Ave
dba 20' @ 100% rated load: ... 64.3Ave
dba 10' @ 70% rated load: ...... 66.4Ave
dba 20' @ 70% rated load: ..... 60.4Ave

Performance / Features

Gas inlet pressure: ..........0.5 to 2 PSI inlet pressure (see note 1)
Ign charger
Voltage: ...................... 13.5Vdc
Current: ..................... 6A max
Remote interface length:
• 75ft max
• Distance depends upon proper installation, de-rating and wire gauge
  (see note 2)
Fuel system, controls & monitoring:
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.
Sensors:
• Gas hazard
• Pad shear
• Water intrusion
• Tamper

Safety shutdowns
All models:
• Low oil pressure
• Low fuel pressure
• Gas hazard
  shutdown (propane only)
• Over temp
• Water intrusion
• Pad shear
• Gas hazard
  (propane or natural gas)
• Over speed
• Over crank

Optional feature:
Cold start kit: Provides additional starting capability at temperatures below
17.7˚C (0˚F).

Mechanical

PN-6x Dimensions:
  cm: .......................... 99H x 100W x 61D
  inches: ........................ 39H x 39.25W x 24D
  with optional pedestal ........ 144H cm (57H in)
Weight: ...................... 174kg (338lbs)
  with optional pedestal ......... 168kg (370lbs)
APU fuel consumption:
Natural gas: 1000 BTU/ft.3 .......... 156ft3/hr
Propane gas: 2520 BTU/ft.3 ...... 1.48gal/hr
  54hr/hr
  6.24lbs/hr
Exterior surface temperature .... 65°C max (149˚F)
  (meets requirements of UL/CSA)

Agency Compliance

UL1778
UL2200
NFPA 37/54/58/70
CSA C22.2 No.107.1
EMC/FCC Part 15 Class A

Note: Contact Alpha Technologies for the following:
1. Low pressure
2. Remote interface length distance
Renewable Energy Solutions

The Alpha Group member companies represent global powering expertise in the Renewable, Industrial, Cable TV/Broadband and Telecommunications industries. Through partnership between OutBack Power, Alpha Energy and NavSemi Technologies Pvt. Ltd., Alpha Group companies are able to leverage collective experience and resources that come with many years as a global powering solutions pioneer.

• **Focus on Engineered Off-Grid and Hybrid Power Systems (HPS)** Alpha Group has built its reputation by providing customized powering solutions designed to meet the unique powering requirements of each individual installation throughout the world.

• **Unparalleled Design Expertise** As a member of The Alpha Group of companies, we draw on more than three decades of powering expertise to ensure that projects are completed on time and on budget.

• **Optimized Reliability** High-profile, mission-critical projects in the military and security markets underscore our capability and commitment to innovative designs that uphold maximum reliability.

• **OEM Supplier Advantage** Leveraging key supplier relationships and volume purchasing contracts allows us to maximize customer value and provide simplified single-point accountability.

• **System Superiority at All Stages** From proposal, design and manufacturing to testing, delivery and support, Alpha offers complete, single-source solutions to meet today’s powering challenges.
**Alpha Energy**, member of The Alpha Group and a division of Alpha Technologies Services, is a full-service engineering and project development company for the distributed generation power industry. Alpha is recognized as a market innovator in packaging renewable energy technologies and is one of the leading developers of turn-key photovoltaic systems for commercial, residential, institutional and remote applications. Utilizing solar, wind and alternative resources, Alpha Energy provides innovative power conversion solutions for the most demanding applications. www.alpha.com

**Outback Power Technologies**, a member of The Alpha Group, is the leading designer and manufacturer of advanced power electronics for renewable energy, backup power and mobile applications. With an emphasis on product performance, OutBack has established itself as the product of choice in harsh environmental conditions where product reliability is paramount. For grid-tied, grid-interactive, and off-grid applications, OutBack has advanced power conversion electronics to make your renewable energy system efficient and dependable. www.outbackpower.com

**NavSemi Technologies**, a member of The Alpha Group, is committed to making solar energy affordable through technological innovation in power electronics, software algorithms, and balance-of-system component engineering. Its application-oriented designs provide feature-rich, competitive and reliable products to end-users for longer, worry-free renewable energy system operation. www.navsemi.com

**Components**

<table>
<thead>
<tr>
<th><strong>Radian Series Inverter/Charger</strong></th>
<th><strong>FX Inverter/Charger</strong></th>
<th><strong>FLEXmax Charge Controllers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 8000W of continuous power</td>
<td>• Sinewave output</td>
<td>• Increased PV array output by up to 30%</td>
</tr>
<tr>
<td>• Unsurpassed surge capability</td>
<td>• Intelligent battery charging</td>
<td>• Advanced continuous maximum power point tracking</td>
</tr>
<tr>
<td>• Simplified parallel design allows</td>
<td>• Field serviceable</td>
<td>• Full power output in ambient temperature up to 40°C (104°F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Battery voltages from 12 to 60Vdc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Built-in 128 days of data logging</td>
</tr>
</tbody>
</table>

The Radian Series GS8048 provides a comprehensive answer for grid-interactive and stand-alone power systems.

The FX Series offers an industry leading sealed inverter that has been proven to serve in the most extreme environments, while the VFX is suitable for more protected installations. And unlike typical grid-tied inverters, the GFX continues to function during a grid outage.

OutBack charge controllers allow you to maximize your systems potential and can increase your renewable energy yield by up to 30%.
Solar Power Systems (SPS)
Alpha’s Solar Power Systems (SPS) are solar powered DC power systems that support loads of up to 200 Watts. All system designs include the most recent advances in PV manufacturing, electronic controls and power management.
- Battery-based, off-grid applications
- For smaller loads up to 200 watts
- Multiple design choices including economy, standard or premium grade
- Pole-mount arrays and enclosed electronics
- Larger, ground-mount battery banks also available

Hybrid Power Systems (HPS)
Alpha’s Hybrid Power Systems (HPS) are ideal for a wide variety of mission critical applications, including telecom, security, military and pipeline operations. These highly versatile power plants are fully-configurable with AC or DC input and output options, and include inverters, DC rectifiers, converters, breakers, alarms, batteries and solar controllers.
- Multiple power generation sources
- Fully integrated system design
- For larger, off-grid applications
- Application specific, custom systems available

Security Solar Power Systems (sSPS)
Security Solar Power Systems (sSPS) are specifically designed, engineered and built to meet the unique powering requirements of wireless high-end security cameras in locations where grid power is either non-existent or impractical to access. Each sSPS model is a complete solution featuring:
- Integrated pole-mounted PV/solar panel
- Back-up battery storage
- Compact NEMA 3-R corrosion resistant enclosure with conformal coating
- Integrated on-board electronics support Class III 802.3 compliant cameras
- Operating temperature range from -20 to 55°C**
- Integrated Power over Ethernet (PoE) switch, 1-4 port pre-configured on selected models

** Temperature range applies to component functionality and not the potential effects of extreme temperatures on system or battery operations.

Photovoltaic Power System (PVPS)
Alpha’s Photovoltaic Power Systems (PVPS) are ideal for customers seeking to incorporate solar electricity into DC-based powering applications. These scalable systems provide direct DC to DC input and output, maximizing available power. This fully configurable power plant also offers diverse options including programmable remote monitoring.
- Battery-based, on-grid or off-grid applications
- Provides power to battery bank or DC bus
- Fully scalable to meet power requirements
- Optional remote status monitoring
Services & Support

Alpha has the knowledge, experience and resources to provide you with the service and support solutions that keep your power infrastructure optimized and providing continuous, reliable power. We offer a full range of services designed to optimize investments by protecting assets and maximizing uptime, while ensuring reliability and performance of your equipment when it’s needed most.

Alpha’s service goal is to enable you to confidently focus on your core business, knowing there is a single point of contact for all of your power system servicing needs such as training, troubleshooting, project management, warranties, EF&I and more. Alpha’s services including:

- Complete EF&I services
- Both on-site repair and depot repair
- Critical facility upgrades and design build services
- Turnkey installation and startup
- Project management, site evaluations and facility audits
- Monitoring and emergency service planning
- Bundled or single element service contracts
- Preventative maintenance including proactive diagnosis
- Fiber/coax/power supply installation and activation
- Battery renewal or replacement
- HVAC/CRAC install and engineering
- Turn up and test
- Extended warranty
- Training: Standard, in-class sessions; or customized for you and available on-site.
- Custom and on-demand services
- 24/7 emergency technical support

We service telecom customers of all sizes, from small independents to the largest national carriers in the following domains:
- Central Offices
- Co-location facilities
- Broadband headends
- Cell sites
- Outside plant
- Customer premise
- Line power
- DAS
- Small cells
WHAT’S THE DIFFERENCE AT ALPHA?

Our distinctive service excellence at Alpha is not just having expertise or the latest high-tech equipment…but simply being as “easy to do business with” as possible, and understanding your powering challenges better than anyone else. Combining this with our innate understanding of Alpha product uniquely positions us as the most qualified supplier of services for power infrastructure in the marketplace.

Alpha’s quality management system governs not only our products but our broad services portfolio, procedures and processes. Pooling this with our operational excellence and continuous improvement programs, we aim to achieve complete customer satisfaction by providing service of the highest standard and value.

If you have a pressing powering challenge, contact us with your specific requirements at 1.800.667.8743 (toll free North America) or email sales@alpha.ca. Visit Alpha online at www.alpha.ca/service for more information.

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SERVICES & SUPPORT

Alpha Service Plans

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**SERVICES**

<table>
<thead>
<tr>
<th>Service</th>
<th>Delayed Startup Warranty</th>
<th>Factory Warranty</th>
<th>Extended Warranty</th>
<th>Reliability</th>
<th>Reliability Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Technical Support</td>
<td>Postpones Factory Warranty / Extended Warranty for 6 months - 2 years</td>
<td>6:00 am - 5:00 pm PST Mon - Fri</td>
<td>6:00 am - 5:00 pm PST Mon - Fri</td>
<td>24x7</td>
<td>24x7</td>
</tr>
<tr>
<td>Advanced Replacement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depot Repair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freight to Customer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install &amp; Commissioning</td>
<td>Purchaseable via Quote</td>
<td>Purchaseable via Quote</td>
<td>Purchaseable via Quote</td>
<td>Discount Eligible</td>
<td>Discount Eligible</td>
</tr>
<tr>
<td>Parts</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>OOW Discount Eligible</td>
<td>OOW Discount Eligible</td>
</tr>
<tr>
<td>Preventative Maintenance</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Annual PM Included</td>
<td>Annual PM Included</td>
</tr>
<tr>
<td>Onsite 5 Day Response</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Time &amp; Materials</td>
<td>Included *Priority</td>
</tr>
</tbody>
</table>

---

**SERVICE UPLIFTS - A LA CARTE**

<table>
<thead>
<tr>
<th>Service</th>
<th>Delayed Startup Warranty</th>
<th>Factory Warranty</th>
<th>Extended Warranty</th>
<th>Reliability</th>
<th>Reliability Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Discount Eligible</td>
<td>Discount Eligible</td>
</tr>
<tr>
<td>PM - more than annual</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Discount Eligible &gt;1 year term</td>
<td>Discount Eligible &gt;1 year term</td>
</tr>
<tr>
<td>Onsite Next Business Day Response</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Location Dependent</td>
</tr>
<tr>
<td>Onsite 2 Business Day Response</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Location Dependent</td>
</tr>
<tr>
<td>Emergency Response</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Location Dependent</td>
</tr>
</tbody>
</table>

---

We offer a full range of services designed to optimize investments by protecting assets and maximizing uptime, while ensuring reliability and performance of your equipment throughout its working life.
FIELD SERVICES – INSTALLATION, TEST & COMMISSION
Alpha offers a broad array of field and engineering services for your AC and DC power system and battery requirements, including turnkey installation to commissioning, testing and reporting according to strict quality standards. We can safely handle system reconfigurations, upgrades, relocations and decommissionings up to, and beyond 10,000 Amps, and we offer reduced commissioning pricing if purchased in conjunction with an Alpha Service Plan.

If your business is new to Alpha, our service technicians have the experience and qualifications to work with power equipment of other makes and models.

TECHNICAL SUPPORT
The goal of our technical support team is to delight our customers with exceptional support, and we achieve this by employing a response system featuring traceability and an escalation path that leads right up to our CEO.

In addition to the Technical Response Centers hours of 6am-5pm PST Alpha provides Emergency Technical Support 24 hours 7 days a week, 365 days a year.

WARRANTIES & CONTRACTS
Predictive and preventative maintenance is a critical part of ensuring your power equipment continues to operate as it did the day it was installed. An annual preventative maintenance visit performed by Alpha’s certified technicians will ensure that your batteries and system are up to the job. They will tune up your equipment with precision and speed, using genuine parts and documenting all findings/actions with a comprehensive site report.

Alpha service plans and warranties are designed to help you plan for, and minimize costs. Our Reliability Plan provides regularly scheduled preventative maintenance visits that keep your equipment running smoothly and mitigate costly faults or failures before they happen. Should one of our standard services not be exactly what you are looking for, we would be happy to work with you to define a custom service plan to address the key challenges in your business.

Visit www.alpha.ca/warranty or www.alpha.ca/serviceplans for more details.

For assistance, contact the Alpha Technical Response Team
Toll free North America: 1.888.462.7487
Outside Canada and USA: +1.604.415.7444
6:00 AM - 5:00 PM North American Pacific Standard Time for regular inquiries
24/7 Emergency Support: 1.888.462.7487
To report a problem, visit: www.alpha.ca/report-a-problem
To request depot repair, visit: www.alpha.ca/rma
Today’s advanced power electronics require skilled, experienced technicians to not only maintain a networks’ safety and performance; but to ensure its efficiency, reliability and cost effectiveness. Alpha Technologies offers a range of industry renowned Power Training Courses that are both interactive and technical. Delivered by qualified and experienced industry professionals, these courses offer a mix of theory, group activities and hands on training. Attendees will be in an active learning environment that focuses on understanding every nuance of the technology. Field ready information will be presented that can be applied directly to your team’s benefit. Safety and best practices will always be in the foreground to complement and enhance the skills of your team.

Alpha also provides custom training courses, including generic DC Power training, as well as courses on Uninterruptible Power Systems (UPS), AMPS inverter systems and more. Custom courses are tailored to our clients’ specific requirements, and can be delivered onsite or online.

Visit www.alpha.ca/training for more details.

COURSE 1 - TELECOM DC POWER AND CORDEX ADVANCED POWER SYSTEM TRAINING
(P/N: 0700016-001)

This intensive course covers concepts, design, application, maintenance and operation of DC power systems/components, and includes classroom instruction as well as hands-on training. Courses are taught by industry experts in a classroom and lab environment.

The classes are focused on the advanced Alpha Cordex series of power system controllers and rectifiers. Many of the engineering, installation and maintenance practices can be applied to all types of DC power systems.

Course is available to be conducted on site at your location.

Who should attend
Developed specifically for Alpha customers, the course is intended to complement the basic electrical knowledge of Telecommunications technicians/engineers with specialized training in modern DC power systems and components.

Students will receive certificates upon successful completion of the course.

Key Features
- DC Power system theory
- DC System sizing
- Site engineering
- Installation and commissioning
- Safety
- Cordex controller programming
- Remote access, Ethernet, POTS and SNMP
- 40% hands-on training
- Basic maintenance and troubleshooting techniques
- Checking alarm set-points
- Certification
- SNMP and MODBUS

Benefits
On completion of the course students will be proficient in the design, installation, maintenance and operation of Alpha Cordex DC power systems and will be prepared to work safely and efficiently in this environment.
**Course 2 - Power Systems for Cable Applications**

*(P/N: 0700017-001)*

**Headend DC Power Training**

The DC power headend course covers concepts, maintenance and operation of DC power systems/components, and includes classroom instruction as well as hands-on training. The classes are focused on the advanced Alpha Cordex series of power system controllers and rectifiers with an overview of the AMPS inverter systems.

**Outside Plant Course**

The outside plant course will cover the XM3 cable UPS operating and configuration parameters. The communication module along with battery maintenance and Midtronics Celltron conductance testing will be included in the classroom instruction as well as hands-on training.

*Courses are available to be conducted on site at your location.*

**Who should attend**

Developed specifically for Alpha customers, the course is intended to complement the basic electrical knowledge of Cable Telecommunications technicians/engineers with specialized training in modern DC power systems and or outside plant components.

**Key Features**

**Headend**
- DC Power system theory
- Cordex controller; setting parameters
- Remote access; Ethernet, and SNMP
- Programming and checking alarm set-points
- 25% Hands-on training
- AMPS Inverter System

**Outside Plant**
- XM3; setting parameter
- Understanding parameters
- Battery theory and safe practices
- Celltron battery conductance testing
- Hands on for both the XM and batteries

**Benefits**

Having two separate course focused on the cable telecommunication field you will have the opportunity to train your team on the equipment they are working with and to be prepared to work safely and efficiently in this environment.

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**Course 3 - Cordex Power Systems - Basic**

*(P/N: 0700019-001)*

This introductory course covers concepts and operation of DC power systems/components, and includes classroom instruction as well as hands-on training. Courses are taught by industry experts in a classroom and lab environment.

The classes are focused on the advanced Alpha Cordex series of power system controllers and rectifiers.

*Course is available to be conducted on site at your location.*

**Who should attend**

Developed specifically for Alpha customers, the course is intended to complement the basic electrical knowledge of Telecommunications technicians/engineers with specialized training in modern DC power systems and components.

**Key Features**

- Cordex controller; setting parameters
- Remote access; Ethernet, and SNMP
- 50% hands-on training
- Checking alarm set-points
- Programming

**Benefits**

On completion of the course students will be proficient in navigating the Alpha Cordex Controller in DC power systems and will be prepared to work safely and efficiently in this environment.
**Course 4 - Cordex Power Systems - Advanced**
(P/N: 0700018-001)

This intensive course covers concepts and operation of DC power systems/components, and includes classroom instruction as well as hands-on training. Courses are taught by industry experts in a classroom and lab environment.

The classes are focused on the advanced Alpha Cordex series of power system controllers and rectifiers.

*Course is available to be conducted on site at your location.*

**Who should attend**

Developed specifically for Alpha customers, the course is intended to complement the basic electrical knowledge of Telecommunications technicians/engineers with specialized training in modern DC power systems and components.

**Key Features**
- DC Power systems
- Installation and commissioning
- Safety
- Cordex controller programming
- Remote access, Ethernet, POTS and SNMP
- 60% hands-on training
- Basic maintenance and troubleshooting techniques
- Checking alarm set-points
- SNMP and MODBUSS

**Benefits**

On completion of the course students will be proficient in the installation and operation of Alpha Cordex DC power systems and will be prepared to work safely and efficiently in this environment.

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**Course 5 - Telecom DC Power**
(P/N: 0700020-001)

This intensive, course covers concepts, design, application, maintenance and operation of DC power systems/components, and includes classroom instruction as well as hands-on training. Courses are taught by industry experts in a classroom and lab environment.

The classes are focused on the advanced Alpha Cordex series of power system controllers and rectifiers. Many of the engineering, installation and maintenance practices can be applied to all types of DC power systems.

*Course is available to be conducted on site at your location.*

**Who should attend**

Developed specifically for Alpha customers, the course is intended to complement the basic electrical knowledge of Telecommunications technicians/engineers with specialized training in modern DC power systems and components.

**Key Features**
- DC Power system theory
- DC System sizing
- Site engineering
- Installation and commissioning
- Safety
- 25% hands-on training
- Basic maintenance and troubleshooting techniques
- Checking alarm set-points
- SNMP and MODBUSS

**Benefits**

On completion of the course students will understand the fundamental design, installation, maintenance and operation of Alpha Cordex DC power systems and will be prepared to work safely and in this environment.
ATL CONTACT US

REQUEST FOR INFORMATION
• Visit www.alpha.ca/request-information
• Call Canada/USA (Toll Free): 1.800.667.8743 / International: 1.604.436.5900

REQUEST FOR A QUOTE
• Visit www.alpha.ca/request-quotation
• Call Canada/USA (Toll Free): 1.800.667.8743 / International: 1.604.436.5900

TRACK YOUR ORDER
• Visit https://www.alpha.ca/ordertracking
• Email: csr@alpha.ca

REQUEST FOR SERVICE & SUPPORT
• Regular Business Hours: Monday-Friday, 6am-5pm Pacific Standard Time
  Canada/USA (Toll Free): 1.888.462.7487 / International: 1.604.436.5547
• Outside Normal Business Hours
  24/7 Emergency Technical Support Service: 1.888.462.7487
• Visit www.alpha.ca/rma
• Email: support@alpha.ca

REPORT A PROBLEM
• Regular Business Hours: Monday-Friday, 6am-5pm Pacific Standard Time
  Canada/USA (Toll Free): 1.888.462.7487 / International: 1.604.436.5547
• Outside Normal Business Hours
  24/7 Emergency Technical Support Service: 1.888.462.7487
• Visit http://www.alpha.ca/report-a-problem
## Corporate Headquarters

| **Address** | Alpha Technologies Ltd.  
| 7700 Riverfront Gate  
| Burnaby, BC  
| Canada V5J 5M4 |
| **Phone** | **Canada/USA (Toll-Free)**  
| 1.800.667.8743  
| **International**  
| 1.604.436.5900 |
| **Fax** | 604.436.1233 |
| **Email** | sales@alpha.ca |
| **Website** | www.alpha.ca |

## General Inquiries

- **Phone**
  - **Canada/USA (Toll-Free)**: 1.800.667.8743
  - **International**: 1.604.436.5900
- **Fax**: 604.436.1233
- **Email**: sales@alpha.ca
- **Website**: www.alpha.ca

### Provides quotes and bid proposals for customer configured power systems and enclosures

### All purchase orders must be sent via fax or email to:

- Please fax orders to: 604.638.8698
- Email to: order@alpha.ca

## Sales / Account Management

| **Phone** | **Canada/USA (Toll-Free)**  
| 1.800.667.8743  
| **International**  
| 1.604.436.5900 |
| **Email** | sales@alpha.ca |

### Provides quotes and bid proposals for customer configured power systems and enclosures

### All purchase orders must be sent via fax or email to:

- Please fax orders to: 604.638.8698
- Email to: order@alpha.ca

## Inside Sales

| **Phone** | **Canada/USA (Toll-Free)**  
| 1.800.667.8743  
| **International**  
| 1.604.415.7477 |
| **Email** | insidesales@alpha.ca |

### Provides pricing and availability for configured systems and spare parts (including breakers, fuses, cables, rectifier accessories, rack accessories, etc.)

### All sales inquiries – including pricing and availability – from channel partners (VARs and distributors)

### All purchase orders must be sent via fax or email to:

- Please fax orders to: 604.638.8698
- Email to: expressorders@alpha.ca
# Contact Us

## Customer Service

<table>
<thead>
<tr>
<th>Phone</th>
<th>1.800.667.8743</th>
<th>Purchase orders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canada/USA (Toll-Free)</strong></td>
<td>1.800.667.8743</td>
<td>Order Status</td>
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<tr>
<td><strong>International</strong></td>
<td>1.604.415.7474</td>
<td>Order Tracking</td>
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<tr>
<td><strong>Phone</strong></td>
<td>1.800.667.8743</td>
<td>Order Expedites</td>
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<tr>
<td><strong>International</strong></td>
<td>1.604.415.7474</td>
<td>Freight inquiries</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:csr@alpha.ca">csr@alpha.ca</a></td>
<td>Any questions or concerns related to an order</td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td>To track your orders online: <a href="http://www.alpha.ca/ordertracking">www.alpha.ca/ordertracking</a></td>
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## Service & Support

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<th>1.888.462.7487</th>
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<tbody>
<tr>
<td><strong>North America (Toll-Free)</strong></td>
<td>1.888.462.7487</td>
<td>Mon-Fri, 6AM - 5PM PST for regular inquiries</td>
</tr>
<tr>
<td><strong>International</strong></td>
<td>+1.604.436.5547</td>
<td>24/7 for emergency support</td>
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</tr>
<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:training@alpha.ca">training@alpha.ca</a></td>
<td>Requests for returns</td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td><a href="http://www.alpha.ca/training">www.alpha.ca/training</a></td>
<td>Return status</td>
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<td></td>
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<td>Warranty enquiries</td>
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## Returns and Repairs

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<th>Online RMA Form: <a href="http://www.alpha.ca/rma">www.alpha.ca/rma</a></th>
<th>Requests for returns</th>
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## Training Courses

<table>
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<tr>
<th>Phone</th>
<th>1.888.462.7487</th>
<th>DC Power Training Courses</th>
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<tbody>
<tr>
<td><strong>North America (Toll-Free)</strong></td>
<td>1.888.462.7487</td>
<td>Custom courses available</td>
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<tr>
<td><strong>International</strong></td>
<td>+1.604.436.5547</td>
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</tr>
<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:training@alpha.ca">training@alpha.ca</a></td>
<td></td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td><a href="http://www.alpha.ca/training">www.alpha.ca/training</a></td>
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## Accounts Receivable

<table>
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<tr>
<th>Phone</th>
<th>1.800.667.8743</th>
<th>Customer invoices and payments</th>
</tr>
</thead>
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<tr>
<td><strong>Canada/USA (Toll-Free)</strong></td>
<td>1.800.667.8743</td>
<td>Customer invoices and payments</td>
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<tr>
<td><strong>International</strong></td>
<td>1.604.436.5900</td>
<td>Customer invoices and payments</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:accounts.receivable@alpha.ca">accounts.receivable@alpha.ca</a></td>
<td>Customer invoices and payments</td>
</tr>
</tbody>
</table>

## Freight inquiries

Any questions or concerns related to an order