In this section...

Cyberex® Industrial Power Conditioning

UL®/NEMA Industrial UPS Systems............................. H-568–H-582
IEC Industrial UPS Systems ....................................... H-583–H-585
Float Battery Chargers ........................................... H-586–H-590
Standalone Inverter Systems ..................................... H-591–H-592
Standalone Digital Static Transfer Switches .............. H-593–H-594
Power Distribution Systems ...................................... H-595–H-596
UL®/NEMA Industrial UPS Systems

CyberWave UPS — 10kVA/8kW, 15kVA/12kW, 20kVA/16kW

CyberWave UPS, the world’s first digitally controlled UPS for custom industrial applications, combines Cyberex’s hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROMs to set a new standard in UPS performance and reliability. CyberWave UPS has standard features no other UPS manufacturer can match, including Modbus communications, advanced battery management capabilities and the world’s first VGA, full-color touch screen 8” x 11” control panel (PowerPad). In addition, every CyberWave UPS incorporates Cyberex’s Digital Static Transfer Switch design for increased system redundancy and reliability.

Features
• IGBT-based PWM inverter
• Digital Signal Processing (DSP)
• Fiber optic datapaths
• Full-color touch screen monitor panel
• Full isolation – input/output transformers
• Industrial-grade frame/cabinet
• Fully rated static switch
• Maintenance bypass switch
• Modbus communications
• RS-232 communications port
• Meets NEMA/UL® 1778 standard
UL®/NEMA Industrial UPS Systems

Mimic Display

UPS Module

Circuit Breakers/Fuse Sizes

<table>
<thead>
<tr>
<th></th>
<th>10kVA/8kW</th>
<th>15kVA/12kW</th>
<th>20kVA/16kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB 201 – AF/AT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>208V</td>
<td>125AF/80AT</td>
<td>125AF/125AT</td>
<td>150AF/250AT</td>
</tr>
<tr>
<td>480V</td>
<td>125AF/35AT</td>
<td>125AF/50AT</td>
<td>125AF/80AT</td>
</tr>
<tr>
<td>F 101, 201, 202 – Rating (A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>150A</td>
<td>250A</td>
<td>300A</td>
</tr>
<tr>
<td>240VDC</td>
<td>80A</td>
<td>125A</td>
<td>150A</td>
</tr>
<tr>
<td>CB 102, 154, 159 – Rating (AF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VAC</td>
<td>125A</td>
<td>250A</td>
<td>250A</td>
</tr>
<tr>
<td>CB 202, 203, 101 – Rating (AF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>125A</td>
<td>250A</td>
<td>250A</td>
</tr>
</tbody>
</table>

Hardware Configuration

Inverter

Isolation Transformer
### UL®/NEMA Industrial UPS Systems

#### Product Specifications

**AC Input**
- **Input Voltage**: 480VAC, 3W+G
  - Max. Input Current @ Rated Load (Nominal VAC)
    - (10kVA/8kW): 21A @ 480VAC–49A @ 208VAC
    - (15kVA/12kW): 32A @ 480VAC–74A @ 208VAC
    - (20kVA/16kW): 43A @ 480VAC–99A @ 208VAC
- **Input Voltage Range**: +10%–20% VAC from Nominal
- **Input Power Factor**: .75 @ Full Load and Nominal
- **Current Walk-In**: Up to Full Load in 15 Seconds
- **Surge Withstand**: Meets IEEE 587/ANSI C62.41
- **Input Current THD%**: 30% Typical, 10% with Optional Input Filter

**DC Bus/Battery**
- **DC Voltage (Nominal)**: 120VDC (60 Cells Nominal)
  - 240VDC (120 Cells Nominal)
- **DC Range**: 105–140VDC–210–280VDC
- **DC Regulation**: ±25% from 0 to 100% Load
- **DC Ripple**: < 2% RMS Ripple @ 100% Load with Battery Connected
- **DC-AC Efficiency**: 88% (Typical)
- **DC End Volts**: 1.75V/Cell End Volts

**Environmental**
- **Acoustical Noise Level**: < 60 dBA @ 3 Feet
- **Operating Temperature**: 0–40°C
- **Relative Humidity**: 0–95% Non-Condensing
- **Access**: No Rear or Side Access Required for Operations or Maintenance
- **AC Efficiency**: Typical 83% (kW out/kW in)
- **Cooling**: Forced Air (in front/out top)
- **Heat Rejection**: 4200 BTU/hr.
  - (10 kVA/8 kW): 4200 BTU/hr.
  - (15 kVA/16 kW): 5600 BTU/hr.
  - (20 kVA/16 kW): 7460 BTU/hr.
- **Operating Altitude**: Up to 1000m w/o Derating Load

**AC Output**
- **Output Voltage**: 120V (other voltages available; contact factory)
- **Output Current (Nominal)**
  - (10kVA/8kW): 83A @ 120VAC
  - (15kVA/16kW): 125A @ 120VAC
  - (20kVA/16kW): 167A @ 120VAC
- **Voltage Regulation**: ±.5% Steady State for 0 to 100% Load Change
- **Transient Response**:
  - <± 5% for a 100% Load Step
  - <± 1% for a Loss/Return AC Input Power
  - <± 5% for Manual Transfer to Bypass and Back, 100% Load
  - <± 5% for a 100% Load Step
- **Recovery**: Return to within ± 2.5% of Nominal within 16 mSec
- **Voltage Distortion**: Linear Loads: ± 3.5% @ 100% Load
- **Overload**:
  - Up to 150% for 15 Min.
  - >1000% for 1 Cycle
- **Frequency**: 60 Hz (50 Hz Optional)
- **Frequency Stability**: ±.1% Free Running
- **Frequency Slew Rate**: 1.0 Hz/Sec, Maximum

**Weight**
- M1, M2: 1,600 lb. (726 kg)
- M3: 2,100 lb. (953 kg)

**Metering**

<table>
<thead>
<tr>
<th>Metering Features</th>
<th>PowerPad 1</th>
<th>PowerPad 2</th>
<th>PowerPad 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rectifier</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Voltage (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Current (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Output Voltage (VDC)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Output Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voltage (VDC)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Runtime</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Time Remaining</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Power</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Total Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Test Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Inverter</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voltage (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Frequency</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Voltage (VDC)</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voltage (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Frequency</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Real Power (W)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Apparent Power (VA)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>% Loading</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Crest Factor</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Peak Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Power Factor</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Alternate Line</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

To order the CyberWave UPS, please contact your T&B sales representative.
**UL®/NEMA Industrial UPS Systems**

**CyberWave UPS — 25kVA/20kW, 30kVA/24kW**

CyberWave UPS, the world’s first digitally controlled UPS for custom industrial applications, combines Cyberex’s hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROMs to set a new standard in UPS performance and reliability. CyberWave UPS has standard features no other UPS manufacturer can match, including Modbus communications and advanced battery management capabilities and the world’s first VGA, full-color touch screen 6" x 11" control panel (PowerPad). In addition, every CyberWave UPS incorporates Cyberex’s Digital Static Transfer Switch design for increased system redundancy and reliability.

**Features**
- IGBT-based PWM inverter
- Digital Signal Processing (DSP)
- Fiber optic datapaths
- Full-color touch screen monitor panel
- Full isolation – input/output transformers
- Industrial-grade frame/cabinet
- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
- Meets NEMA/UL® 1778 specifications
UL®/NEMA Industrial UPS Systems

Mimic Display

UPS Module

Circuit Breakers/Fuse Sizes

<table>
<thead>
<tr>
<th></th>
<th>25kVA/20kW</th>
<th>30kVA/24kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB 201 – AF/AT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>208V</td>
<td>250 AF/200 AT</td>
<td>225 AF/250 AT</td>
</tr>
<tr>
<td>480V</td>
<td>125 AF/80 AT</td>
<td>125 AF/90 AT</td>
</tr>
<tr>
<td>F 101, 201, 202 – Rating (A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>400A</td>
<td>500A</td>
</tr>
<tr>
<td>240VDC</td>
<td>200A</td>
<td>250A</td>
</tr>
<tr>
<td>CB 102, 154, 159 – Rating (AF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VAC</td>
<td>400A</td>
<td>400A</td>
</tr>
<tr>
<td>CB 202, 203, 101 – Rating (AF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>400A</td>
<td>400A</td>
</tr>
</tbody>
</table>

Hardware Configuration

Inverter

Isolation Transformer
# UL®/NEMA Industrial UPS Systems

## Product Specifications

### AC Input
- **Input Voltage**: 480VAC, 3W+G
- **Max. Input Current @ Rated Load (Nominal VAC)**:
  - 25kVA/20kW: 53A @ 480VAC–123A @ 208VAC
  - 30kVA/24kW: 43A @ 480VAC–148A @ 208VAC
- **Input Voltage Range**: +10% to -20% VAC from Nominal
- **Input Power Factor**: .75 @ Full Load and Nominal
- **Current Walk-In**: Up to Full Load in 15 Seconds
- **Surge Withstand**: Meets IEEE 587/ANSI C62.41
- **Input Current THD%**: 30% Typical, 10% with Optional Input Filter

### DC Bus/Battery
- **DC Voltage (Nominal)**:
  - 120VDC (60 Cells Nominal)
  - 240VDC (120 Cells Nominal)
- **DC Range**: 105–140VDC–210–280VDC
- **DC Regulation**: ±25% from 0 to 100% Load
- **DC Ripple**: < 2% RMS Ripple @ 100% Load with Battery Connected
- **DC-AC Efficiency**: 88% (Typical)
- **DC End Volts**: 1.75V/Cell End Volts

### Environmental
- **Acoustical Noise Level**: < 60 dBA @ 3 Feet
- **Operating Temperature**: 0–40°C
- **Relative Humidity**: 0–95% Non-Condensing
- **Access**: No Rear or Side Access Required for Operations or Maintenance
- **AC Efficiency**: Typical 83% (kW out/kW in)
- **Cooling**: Forced Air (in front/out top)
- **Heat Rejection**: 12,050 BTU/hr. (25kVA/20kW), 19,320 BTU/hr. (30kVA/24kW)
- **Operating Altitude**: Up to 1000m without Derating Load

### AC Output
- **Output Voltage**: 120V (other voltages available; contact factory)
- **Output Current (Nominal)**:
  - 25kVA/20kW: 208A @ 120VAC
  - 30kVA/24kW: 250A @ 120VAC
- **Voltage Regulation**: <±.5% Steady State for 0 to 100% Load Change
- **Transient Response**: <± 1% for a Loss/Return AC Input Power
- **Recovery**: Return to within ± 2.5% of Nominal within 16 msec
- **Voltage Distortion**: Linear Loads: <± 3.5% @ 100% Load
- **Overload**: Up to 150% for 15 Min.
- **Overload Static Bypass**: >100% for 1 Cycle
- **Frequency**: 60 Hz (50 Hz Optional)
- **Frequency Stability**: ±1% Free Running
- **Frequency Slew Rate**: 1.0 Hz/Sec. Maximum

### Weight
- **25kVA**
  - M1: 2,300 lb. (1,043kg)
  - M2: 2,560 lb. (1,161kg)
  - M3: 2,620 lb. (1,188kg)
- **30kVA**
  - M1: 2,590 lb. (1,175kg)
  - M2: 2,850 lb. (1,293kg)
  - M3: 2,910 lb. (1,320kg)

## Metering

### Three Options: PowerPad 1, PowerPad 2 and PowerPad 3

<table>
<thead>
<tr>
<th>Metering Value (1% Accurate)</th>
<th>PowerPad 1</th>
<th>PowerPad 2</th>
<th>PowerPad 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectifier Input Voltage (All Phase)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input Current (All Phase)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Output Voltage (VDC)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Output Current</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Battery Voltage (VDC)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Voltage (RMS)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Current (RMS)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Frequency</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Inverter
- **Input Voltage (VDC)**: Optional
- **Current (RMS)**: Optional
- **Frequency**: Optional

### Output
- **Voltage (RMS)**: ✓
- **Current (RMS)**: ✓
- **Frequency**: ✓
- **Real Power (W)**: ✓
- **Apparent Power (VA)**: ✓
- **% Loading**: ✓
- **Crest Factor**: ✓
- **Peak Current**: ✓
- **Power Factor**: ✓

### Alternate Line
- **Input Voltage**: ✓
- **Input Frequency**: ✓

To order the CyberWave UPS, please contact your T&B sales representative.
**UL®/NEMA Industrial UPS Systems**

**CyberWave UPS — 40kVA/32kW, 50kVA/40kW, 60kVA/48kW**

CyberWave UPS, the world’s first digitally controlled UPS for custom industrial applications, combines Cyberex’s hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROMs to set a new standard in UPS performance and reliability. CyberWave UPS has standard features no other UPS manufacturer can match, including Modbus communications, advanced battery management capabilities and the world’s first VGA, full-color touch screen 8” x 11” control panel (PowerPad). In addition, every CyberWave UPS incorporates Cyberex’s Digital Static Transfer Switch design for increased system redundancy and reliability.

**Features**

- IGBT-based PWM inverter
- Digital Signal Processing (DSP)
- Fiber optic datapaths
- Full-color touch screen monitor panel
- Full isolation – input/output transformers
- Industrial-grade frame/cabinet
- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
- Meets NEMA/UL® 1778 standard
UL®/NEMA Industrial UPS Systems

Mimic Display

UPS Module

Circuit Breakers/Fuse Sizes

<table>
<thead>
<tr>
<th>Circuit Breakers/Fuse Sizes</th>
<th>40KVA/32KW</th>
<th>50KVA/40KW</th>
<th>60KVA/48KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB 201 – AF/AT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>208V</td>
<td>400AF/300AT</td>
<td>400AF/350AT</td>
<td>600AF/450AT</td>
</tr>
<tr>
<td>480V</td>
<td>125AF/125AT</td>
<td>250AF/150AT</td>
<td>250AF/175AT</td>
</tr>
<tr>
<td><strong>F 101, 201, 202 – Rating (A)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>600A</td>
<td>800A</td>
<td>800A</td>
</tr>
<tr>
<td>240VDC</td>
<td>300A</td>
<td>400A</td>
<td>500A</td>
</tr>
<tr>
<td><strong>CB 102, 154, 159 – Rating (AF)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VAC</td>
<td>400A</td>
<td>600A</td>
<td>600A</td>
</tr>
<tr>
<td><strong>CB 202, 203, 101 – Rating (AF)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120VDC</td>
<td>600A</td>
<td>600A</td>
<td>600A</td>
</tr>
</tbody>
</table>

Hardware Configuration

Inverter

Isolation Transformer
### UL/NEMA Industrial UPS Systems

#### Product Specifications

<table>
<thead>
<tr>
<th>AC Input</th>
<th>Input Voltage</th>
<th>480VAC, 3W+G</th>
<th>208VAC, 3W+G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Input Current @ Rated Load (Nominal VAC)</td>
<td>80A @ 480VAC–197A @ 208VAC</td>
<td>107A @ 480VAC–247A @ 208VAC</td>
<td>128A @ 480VAC–296A @ 208VAC</td>
</tr>
<tr>
<td>Input Voltage Range</td>
<td>+10%–20% VAC from Nominal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Power Factor</td>
<td>75% @ Full Load and Nominal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Walk-In</td>
<td>Up to Full Load in 15 Seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Current THD%</td>
<td>30% Typical, 10% with Optional Input Filter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DC Bus/Battery</th>
<th>DC Voltage (Nominal)</th>
<th>120VDC (60 Cells Nominal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Range</td>
<td>100–140VDC–210–260VDC</td>
<td></td>
</tr>
<tr>
<td>DC Regulation</td>
<td>±25% from 0 to 100% Load</td>
<td></td>
</tr>
<tr>
<td>DC Ripple</td>
<td>&lt;2% RMS Ripples @ 100% Load</td>
<td></td>
</tr>
<tr>
<td>DC Efficiency</td>
<td>86% (Typical)</td>
<td></td>
</tr>
<tr>
<td>DC End Volts</td>
<td>17.5V/Cell End Volts</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Acoustical Noise Level</th>
<th>&lt;60 dBA @ 3 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>0–40°C</td>
<td></td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>0–95% Non-Condensing</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>No Rear or Side Access Required for Operations or Maintenance</td>
<td></td>
</tr>
<tr>
<td>AC Efficiency</td>
<td>Typical 83% kW out/kW in</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AC Output</th>
<th>Output Voltages</th>
<th>120V (other voltages available; contact factory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Current (Nominal)</td>
<td>250A @ 120VAC</td>
<td>417A @ 120VAC</td>
</tr>
<tr>
<td>Voltage Regulation</td>
<td>&lt;=5% Steady State for 0 to 100% Load Change</td>
<td></td>
</tr>
<tr>
<td>Transient Response</td>
<td>&lt;=5% for a 100% Load Step</td>
<td></td>
</tr>
<tr>
<td>Recovery</td>
<td>Return to within ±2.5% of Nominal within 16 msec</td>
<td></td>
</tr>
<tr>
<td>Voltage Distortion</td>
<td>Linear Loads: &lt;=3.5% @ 100% Load</td>
<td></td>
</tr>
<tr>
<td>Overload</td>
<td>Up to 150% for 15 Min.</td>
<td></td>
</tr>
<tr>
<td>Overload Static Bypass</td>
<td>&gt;=1000% for 1 Cycle</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>Linear 60 Hz (Optional)</td>
<td></td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>±1% Free Running</td>
<td></td>
</tr>
<tr>
<td>Frequency slew Rate</td>
<td>0.1 Hz/Sec. Maximum</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>40kVA M1</th>
<th>240V = 2,700 lbs. (1,225kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2</td>
<td>240V = 2,700 lbs. (1,225kg)</td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>240V = 3,500 lbs. (1,588kg)</td>
<td></td>
</tr>
<tr>
<td>50kVA M1</td>
<td>240V = 3,200 lbs. (1,451kg)</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>240V = 3,200 lbs. (1,451kg)</td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>240V = 3,800 lbs. (1,723kg)</td>
<td></td>
</tr>
<tr>
<td>60kVA M1</td>
<td>240V = 3,500 lbs. (1,588kg)</td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>240V = 3,500 lbs. (1,588kg)</td>
<td></td>
</tr>
<tr>
<td>M3</td>
<td>240V = 4,200 lbs. (1,905kg)</td>
<td></td>
</tr>
</tbody>
</table>

### Metering

#### THREE OPTIONS: POWERPAD 1, POWERPAD 2 AND POWERPAD 3

<table>
<thead>
<tr>
<th>Metering Features</th>
<th>POWERPAD 1</th>
<th>POWERPAD 2</th>
<th>POWERPAD 3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Metering Value (1% accurate)</th>
<th>Rectifier</th>
<th>Battery</th>
<th>Inverter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Current (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Output Voltage (VDC)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Output Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Voltage (VDC)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Time Remaining</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Power</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Total Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Test Cycles</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

| Output Voltage (RMS)         | ✔         | ✔      | ✔       |
| Current (RMS)                | ✔         | ✔      | ✔       |
| Frequency                    | ✔         | ✔      | ✔       |
| Input Voltage (VDC)          | Optional  | Optional | Optional |

<table>
<thead>
<tr>
<th>Alt. Line</th>
<th>Input Voltage</th>
<th>✔</th>
<th>✔</th>
</tr>
</thead>
</table>

#### Input Frequency

To order the CyberWave UPS, please contact your T&B sales representative.
**UL®/NEMA Industrial UPS Systems**

**CyberWave UPS — 75kVA/60kW, 112.5kVA/90kW**

CyberWave UPS, the world’s first digitally controlled UPS for custom industrial applications, combines Cyberex’s hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROMs to set a new standard in UPS performance and reliability. CyberWave UPS has standard features no other UPS manufacturer can match, including Modbus communications, advanced battery management capabilities and the world’s first VGA, full-color touch screen 8” x 11” control panel (PowerPad). In addition, every CyberWave UPS incorporates Cyberex’s Digital Static Transfer Switch design for increased system redundancy and reliability.

**Features**
- IGBT-based PWM inverter
- Digital Signal Processing (DSP)
- Fiber optic datapaths
- Full-color touch screen monitor panel
- Full isolation – input/output transformers
- Industrial-grade frame/cabinet
- Fully rated static switch
- Maintenance bypass switch
- Modbus communications
- RS-232 communications port
- Meets NEMA/UL® 1778 standard
**UL®/NEMA Industrial UPS Systems**

**UPS Module**

- M1: 55" W (1397mm), 34.4" D (873mm)
- M2: 80" W (2032mm), 34.4" D (873mm)
- M3: 129" W (3277mm), 34.4" D (873mm)

**Mimic Display**

**Hardware Configuration**

- M1
- M2
- M3

**Circuit Breakers/Fuse Sizes**

<table>
<thead>
<tr>
<th>Circuit Breakers/Fuse Sizes</th>
<th>75kVA/60kW</th>
<th>112.5kVA/90kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB 201 – AF/AT</td>
<td>208V 600AF/600AT 1200 AF/900 AT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>480V 250AF/250AT 400 AF/400 AT</td>
<td></td>
</tr>
<tr>
<td>F 101, 201, 202 – Rating (A)</td>
<td>240VDC 500A 800A</td>
<td></td>
</tr>
<tr>
<td>CB 102, 154, 159 – Rating (AF)</td>
<td>120VAC 800A 1200A</td>
<td></td>
</tr>
<tr>
<td>CB 202, 203, 101 – Rating (AF)</td>
<td>240VDC 400A 600A</td>
<td></td>
</tr>
</tbody>
</table>
UL®/NEMA Industrial UPS Systems

Product Specifications

AC Input
Input Voltage 480VAC, 3W+G
208VAC, 3W+G
Max Input Current @ Rated Load (Nominal VAC)
(75kVA/60kW) 160A @ 480VAC–370A @ 208VAC
(112.5kVA/90kW) 233A @ 480VAC–353A @ 208VAC
Input Voltage Range +10, -20% VAC from Nominal
Input Power Factor .75 @ Full Load and Nominal
Current Walk-In Up to Full Load in 15 Seconds
Surge Withstand Meets IEEE 587/ANSI C62.41
Input Current THD% 30% Typical, 10% with Optional Input Filter

DC Bus/Battery
DC Voltage (Nominal) 240VDC (120 Cells Nominal)
DC Range 105–140VDC–210–280VDC
DC Regulation ±25% from 0 to 100% Load
DC Ripple < 2% RMS Ripple @ 100% Load with Battery Connected
DC-AC Efficiency 88% (Typical)
DC End Volts 1.75V/Cell End Volts

Environmental
Acoustical Noise Level < 60 dBA @ 3 Feet
Operating Temperature 0–40° C
Relative Humidity 0–95% Non-Condensing
Access No Rear or Side Access Required
for Operations or Maintenance
AC Efficiency Typical 83% (kW out/kW in)
Cooling Forced Air (in front/out top)
Heat Rejection (75kVA/60kW) 12,050 BTU/hr.
(112.5kVA/90kW) 19,320 BTU/hr.
Operating Altitude Up to 1000m without Derating Load

AC Output
Output Voltages 120V (other voltages available; contact factory)
Output Current (Nominal)
(75kVA/60kW) 625A @ 120VAC
(112.5kVA/90kW) 933A @ 120VAC
Voltage Regulation ±5% Steady State for 0 to 100% Load Change
Transient Response < ± 5% for a 100% Load Step
< ± 1% for a Loss/Return AC Input Power
< ± 5% for Manual Transfer to Bypass and Back, 100% Load
< ± 5% for a 100% Load Step Response
Recovery Return to within ± 2.5% of Nominal within 16 msec
Voltage Distortion Linear Loads: < ± 3.5% @ 100% Load
Overload Up to 150% for 15 Min.
Overload Static Bypass >1000% for 1 Cycle
Frequency 60 Hz (50 Hz Optional)
Frequency Stability ±1% Free Running
Frequency Slew Rate 1.0 Hz/Sec. Maximum

Weight 75kVA 112.5kVA
M1 4,600 lb. (2,087kg) 2,850 lb. (1,239kg)
M2 5,100 lb. (2,313kg) 7,710 lb. (3,497kg)
M3 5,400 lb. (2,449kg) 8,000 lb. (3,629kg)

Metering
THREE OPTIONS: POWERPAD 1, POWERPAD 2 AND POWERPAD 3 METERING VALUE (1% ACCURATE)

<table>
<thead>
<tr>
<th>METERING FEATURES</th>
<th>POWERPAD 1</th>
<th>POWERPAD 2</th>
<th>POWERPAD 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectifier Input Voltage (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Current (All Phase)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Input Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Voltage (VDC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery Voltage (VDC)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Runtime</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Remaining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Cycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Cycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inverter Voltage (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Voltage (VDC)</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Output Voltage (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Current (RMS)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Power (W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apparent Power (VA)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Loading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternate Input Voltage</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Line Input Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To order the CyberWave UPS, please contact your T&B sales representative.
CyberWave Three-Phase UPS

Cyberex® offers a true online, double conversion three-phase output UPS system. It is developed to UL® standards as the optimal solution for applications in oil and gas, power generation and heavy manufacturing processes. Ranging from 10–150kVA, the CyberWave Three-Phase Series incorporates state-of-the-art system topology for higher online system efficiency and longer battery life. In addition, the CyberWave three-phase incorporates Cyberex’s Digital Static Transfer Switch design for increased redundancy and reliability and an optimized battery charging technology. Designed for a 20-year life, the CyberWave Three-Phase Series features PWM inverter technology, DSP digital controls, parallel redundancy and rugged overload and fault clearing capabilities. Moreover, the CyberWave three-phase includes features no other UPS manufacturer can match, including superior diagnostics via user interface, fiber optic data paths for enhanced and accurate controls communication and full-color 8” x 6” touch screen user interface panel. For critical industrial applications, the CyberWave Three-Phase Series ensures increased system reliability and security that only can be attained by a true industrial uninterruptible power supply.

Features
- High online efficiency
- Lowest input THD reflected back to source
- IGBT-based PWM inverter
- Advanced Cyberex® Static Transfer Switch design
- Higher online efficiency
- Optimized battery-charging topology
- Flexible battery string configuration
- Input power factor near unity
- Superior diagnostics
- Digital Signal Processing (DSP)
- Full-color touch screen user interface
- Fiber optic data paths
- Full isolation – input/output transformer
- Event log downloadable via USB
- Standard harmonic mitigating output transformer
- Ambient temperature max. 50° C with 10% derating
UL®/NEMA Industrial UPS Systems

Optional Features
- Isolated, parallel and cascade redundancy
- Blown fuse sensing
- Alternate input and output voltages
- 12-pulse rectifier with isolation transformer
- Double rated charger
- Waveform capture feature
- Bottom cable entry
- Protection up to NEMA Type 12
- Remote battery temperature sensing
- Custom colors

Mimic/LED Indications
- Mains input
- Bypass input
- Load on bypass
- Charger status
- Inverter operation
- Load on inverter
- Synchronization/bypass inverter
- Battery operations
- Battery discharge
- Battery MCCB
- Alarm indication

Dimensions

<table>
<thead>
<tr>
<th>KVA</th>
<th>H (IN.)</th>
<th>W (IN.)</th>
<th>D (IN.)</th>
<th>WEIGHT (LBS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>81.5</td>
<td>50.3</td>
<td>34.4</td>
<td>1540</td>
</tr>
<tr>
<td>20</td>
<td>81.5</td>
<td>50.3</td>
<td>34.4</td>
<td>1650</td>
</tr>
<tr>
<td>30</td>
<td>81.5</td>
<td>60.3</td>
<td>34.4</td>
<td>1850</td>
</tr>
<tr>
<td>30DC</td>
<td>81.5</td>
<td>80.5</td>
<td>34.4</td>
<td>1900</td>
</tr>
<tr>
<td>40</td>
<td>81.5</td>
<td>60.3</td>
<td>34.4</td>
<td>1960</td>
</tr>
<tr>
<td>40 (120 &amp; 240VDC)</td>
<td>81.5</td>
<td>80.5</td>
<td>34.4</td>
<td>2400</td>
</tr>
<tr>
<td>50</td>
<td>81.5</td>
<td>60.3</td>
<td>34.4</td>
<td>2620</td>
</tr>
<tr>
<td>50 (120 &amp; 240VDC)</td>
<td>81.5</td>
<td>80.5</td>
<td>34.4</td>
<td>2700</td>
</tr>
<tr>
<td>60</td>
<td>81.5</td>
<td>60.3</td>
<td>34.4</td>
<td>3000</td>
</tr>
<tr>
<td>60 (120 &amp; 240VDC)</td>
<td>81.5</td>
<td>80.5</td>
<td>34.4</td>
<td>3500</td>
</tr>
<tr>
<td>80</td>
<td>81.5</td>
<td>80.5</td>
<td>34.4</td>
<td>4100</td>
</tr>
<tr>
<td>80 (408VDC)</td>
<td>81.5</td>
<td>98.5</td>
<td>37</td>
<td>4100</td>
</tr>
<tr>
<td>100</td>
<td>81.5</td>
<td>98.5</td>
<td>37</td>
<td>4850</td>
</tr>
<tr>
<td>125</td>
<td>81.5</td>
<td>98.5</td>
<td>37</td>
<td>5200</td>
</tr>
<tr>
<td>150</td>
<td>81.5</td>
<td>98.5</td>
<td>37</td>
<td>5500</td>
</tr>
</tbody>
</table>
UL/NEMA Industrial UPS Systems

Product Specifications

**UPS Main Input**
- **Rectifier Voltage**: 480VAC, 3-Phase, 3W + G
- **Rectifier Voltage Range**: -20% to +15%
- **Input Power Factor**: .92 at Nominal Load
- **Current Total Harmonic Distortion (THD-I)**: 28% or Better for 6-Pulse, 12% or Better for Optional 12 Pulse
- **Inrush Current**: <150% Rectifier Soft Start (<5 sec.), w/ Input Transformer (up to 300%)
- **1200% of Nominal Full Current Load for 100 ms on Input Transformer**
- **Frequency**: 60 Hz
- **Frequency Range**: ±10% at Higher DC Bus

**DC Bus/Circuit**
- **Voltage**: 120, 240 or 408VDC
- **Voltage Tolerance**: ±1% of Nominal Voltage
- **Flux Voltage Range**: 100% ~ 130% of Nominal DC Output Voltage
- **Equalize Charge Time**: 8 – 10X Discharge Time
- **Charging Current Limitation**: Programmable from 20% to 100% of Charger Capacity

**UPS Output**
- **Nominal UPS Rating**: 277/480, 120/208
- **Voltage**: 120, 240 or 408VDC
- **Voltage Regulation**: Steady State for 0 – 100% ±1%, Unbalanced Load for 0 – 100% ±3%, Dynamic at 100% Load Surge ±5% (return to ±1% within 25 msec)
- **Recovery Time**: <25 msec
- **Phase Shift**: Balanced Load 120 deg. ± 1 deg., Unbalanced Load 120 deg. ± 3 deg.
- **Voltage Distortion**: Linear Load <5% at 100% Load, Non-Linear Load <5% at 100% Load
- **Overload**: Inverter 200% for 200 msec, 150% for 1 Min., 125% for 10 Min., 100% Continuous, 1000% for 100 msec, 200% for 1 Sec., 150% for 1 Min., 125% for 10 Min.

**Nominal Frequency**
- **Free Running**: <±.1%
- **Synchronization Range**: Up to ±8% (selectable ±1% – ±8%)
- **Slew Rate**: 1 Hz/Sec.

**System Efficiency**
- **>89% w/o Input Transformer
- **Allowable Power Factor**: .4 Lagging to .9 Leading

**General Environment**
- **Ambient Temperature Range for Storage**: -20° C – 70° C
- **Ambient Temperature Range for Operating**: 0° C – 40° C (to 50° C w/15% derate)
- **Relative Humidity**: 10 – 95% Non-Condensing
- **Operating Altitude**: up to 1000m without Load Derating
- **Access**: Front Only Access, No Rear or Side Access Required
- **Cooling**: Forced Cooling with Redundant Fans
- **Noise Level**: 60 – 70 dBA Depending on Model
- **Degree of Protection**: NEMA Type 1
- **Performance Test**: IEC 62040-3
- **Safety**: Designed to be UL® 1778, 4th Edition Compliant

**EMC**
- **FCC Part 15 Subpart J Class A
- **Enclosure Color**: ANSI 61 Gray

**Alarms**
- **Standard Alarms**
  - **Input**: Under Voltage, Over Voltage
  - **Rectifier**: Under Voltage, Over Voltage
  - **Battery**: Under Voltage, Over Voltage, End of Battery
  - **Inverter**: Under Voltage, Over Voltage, IGBT Limb Fault, Overload

**Metering**
- **Digital – LC Display**
  - **Voltage Meters**: Input (Mains), Rectifier, Alternate, Battery, Inverter, Load
  - **Frequency Meters**: Mains, Alternate, Inverter

**Measurement**
- **Current Meters**: Input (Mains), Battery, Inverter, Load
- **With True RMS**
- **With Power Factor**

**System Ratings**
- **Power Meters**: Total KVA, Total KW, Total Power Factor
- **UPS KVA**, **UPS KW**, **UPS Power Factor**

**To order the CyberWave Three-Phase UPS, please contact your T&B sales representative.**
IEC Industrial UPS Systems

CyberWave UPS CI Series

Cyberex® offers a true online, double conversion UPS system. It is developed to IEC standards as an optimal and cost-effective solution for applications in oil and gas, power generation and heavy manufacturing processes. Ranging from 10–160kVA, the CyberWave CI Series incorporates state-of-the-art system topology for increased system efficiency and battery life. Designed for a 20-year life, these systems feature PWM inverter technology, DSP digital controls, parallel redundancy and rugged overload and fault clearing capabilities. In addition, the CI Series includes fiber optic data paths for enhanced and accurate controls and communication, an input and output isolation transformer and a fully rated, rugged static transfer switch. For critical industrial applications, the CI Series ensures increased system reliability and security that only comes from having truly uninterruptible power.

Features

• IEC 62040 compliant; ideal for international applications
• IGBT-based PWM inverter; digital signal processor for accurate and reliable controls
• Input power factor near unity at full loads with reducing reflected harmonics
• Single-phase fully rated static switch for increased reliability and security
• Internal communication facilitates high-speed CAN bus for improved signal transfer between processors
• High-speed branch fuse clearing design provides enhanced fault-clearing capability
• Input and output isolation transformer provides continuous, clean and regulated power without external effects
• Monitoring via LAN through SNMP or Modbus communication for accurate system analysis

10kVA/8kW
20kVA/16kW
30kVA/24kW
40kVA/32kW
60kVA/48kW
80kVA/64kW
100kVA/80kW
120kVA/96kW
140kVA/112kW
160kVA/128kW
IEC Industrial UPS Systems

Hardware Configuration

Hardware Configuration Key

A Unregulated bus enables flexible battery string configurations and low reflected harmonics
B Separate battery charger reduces ripple on battery for increased battery life and efficiency
C Input and output isolation transformer for maximum reliability
D Fully rated static switch for increased redundancy and reliability — make-before-break operation ensures no load droop

Mimic Display

Mimic/LED Indications
- Mains Input
- Bypass Input
- Load on bypass
- Charger status
- Inverter operation
- Load on inverter

Options
- Parallel or hot standby redundancy
- Input isolation transformer
- Bypass line regulator
- AC distribution panel
- PC-based monitoring and recording unit
- RS-485 communication port
- Monitoring on LAN through SNMP
- Monitoring on LAN through Profibus

- Synchronization/bypass inverter
- Battery operations
- Battery discharge
- Battery MCCB
- Alarm indication

- Battery monitoring system
- Remote annunciator
- Automatic shutdown kit
- DCS connectivity through Modbus/Profibus
- Individual battery health monitoring systems (BHMS)
- IGBT-based rectifier (<5% THDI)
- 12-pulse rectifier for input harmonic reduction (<10)
- Harmonic filter (5th, 7th, 11th and 13th)
**IEC Industrial UPS Systems**

**Product Specifications**

### Main Input
- **Voltage**: 415VAC (Std), 480VAC (optional)
- **Voltage Range**: +15–20% at Full Load
- **Frequency**: 50 Hz (standard) 60 Hz (optional)
- **Input Power Factor**: > .95 at Full Load
- **Input Current Harmonics**: < .20% at Full Load

### DC Bus Charger
- **Voltage**: 110, 120, 220, 240, 360VDC
- **Maximum DC Bus Ripple without Battery**: < 2% RMS 100% Load
- **Maximum DC Bus Ripple with Battery**: < 1% RMS 100% Load

### Output
- **Nominal Voltage**: 220/230/240V (standard)
- **Phase**: 3-Phase, 3-Wire
- **Frequency**: 50 Hz (standard) 60 Hz (optional)
- **Input Power Factor**: > .95 at Full Load
- **Input Current Harmonics**: < .20% at Full Load

### Operating Conditions
- **Ambient Temperature**: 0–45° C
- **Humidity**: 90% Non-Condensing
- **Audible Noise**: 55–75 dBA at 1 meter (model dependent)

### Enclosure
- **Construction**: CRCA Steel Sheet
- **Protection Class**: IP21 (standard)  IP31, IP41 (optional)
- **Finish (Powder Coated)**: RAL 7032 (other colors optional)
- **Ventilation**: Forced Air (internal fans)

### System Ratings

<table>
<thead>
<tr>
<th>BATTERY VOLTAGE (VDC)</th>
<th>110</th>
<th>125</th>
<th>220</th>
<th>250 &amp; 260</th>
<th>360</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>—</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>—</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>—</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>—</td>
</tr>
<tr>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>—</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>—</td>
</tr>
<tr>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>—</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>—</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>—</td>
</tr>
<tr>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>—</td>
</tr>
<tr>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>—</td>
</tr>
<tr>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>—</td>
</tr>
</tbody>
</table>

- **UPS Rating (kVA)**

Higher ratings and other voltages available on request.

To order the CyberWave UPS, please contact your T&B sales representative.
CyberWave RBE II — Three-Phase or Single-Phase (Analog)

CyberWave RBE II industrial float chargers are designed to automatically control charging rates for a wide variety of battery types and to simultaneously provide full-rated output for both continuous and intermittent DC loads. The chargers are constant voltage devices with automatic current limiting. Voltage regulation and current limiting are controlled by solid-state integrated circuitry to ensure maximum performance in minimum space. The CyberWave RBE II is ideally suited to utility, communications and other stationary charger applications.

Design Features

Component Selection
- Electronic and electrical components are substantially derated to ensure long life and reliability. Typical MTBF is 100,000 hours minimum. Components are selected or designed to provide a system life expectancy in excess of 30 years.

Modular Construction
- Control circuits, alarm circuits and electrical sub-assemblies are printed circuit board wired or modularized with plug and socket connections for easy serviceability.

Standard Sub-Assemblies
- Control modules and many electrical sub-assemblies are standardized across the entire range of charger sizes. This minimizes spare parts inventory and simplifies maintenance.

Durable
- Front panels are recessed to prevent accidental damage to meters and controls. Standard cabinets are NEMA 1 enclosures of heavy-gauge phosphatized steel with an attractive, long-lasting acrylic enamel finish.

Ease of Adjustment
- Tap adjustments are not required. Output float voltage, equalize voltage, current limit and alarm levels are potentiometer adjustable.

Ease of Access
- Internal components and connections are easily accessible and/or removable through a hinged front door that opens approximately 180 degrees for easy serviceability.

Ease of Installation
- Cabinets are floor, wall or rack mountable and equipped with knockouts for cable or conduit entrance. Input, output and remote alarm connections are wired to easily accessible, internal terminal blocks.

Random Parallel Operation
- RBE II Series Chargers may be random parallel operated with other chargers of similar regulation and current limit characteristics. Equal load sharing by two chargers requires the addition of the forced load sharing option.

Battery Eliminator Operation
- RBE II Series Chargers will operate as DC power supplies without batteries. Addition of the filtered battery eliminator option will reduce ripple, when used as a battery eliminator, to the greater of .06% or 30mV.

Easy Troubleshooting
- A complete service manual, color-coded wiring, test-point identification and circuit-symbol labeling of internal components make troubleshooting easy.
**Float Battery Chargers**

**Standard Features**
- AC on indicating light
- AC input circuit breaker
- DC output fuses
- AC and DC surge suppressors
- DC output ammeter and voltmeter
- Manual float/equalize switch
- Float and equalize adjustment potentiometers
- Current limit adjustment potentiometer
- DC output blocking diode
- DC output protection diode
- Color-coded internal wiring

**Options and Accessories**
- Alarm relays for remote indication
- CASM — combined alarm status monitor
- DC ground detection for local indication
- Equalize timers
- AC fuse
- DC circuit breaker
- Forced load sharing
- High DC voltage charger shutdown
- Filtered battery eliminator
- Input lightning arrestors
- Surge withstand capability
- AC input voltmeter and/or ammeter

**Product Specifications**

**AC Input**
- **Voltage**
  - Single-Phase: 120/220, 480 or 120/208 VAC
  - Three-Phase: 208, 380 or 480V
- **Input Voltage Tolerance**
  - +10%, –12%
- **Frequency**
  - 60 Hz
- **Input Frequency Tolerance**
  - ±5%
- **Efficiency**
  - 89–93% (typical at 130VDC)

**DC Output**
- **Voltage Ratings**
  - 12, 24, 48, 130 or 260VDC Nominal
- **Current Ratings**
  - 16–600ADC (Three-Phase)
  - 6–100ADC (Single-Phase)
- **DC Output ±.5% with Input Line Variations**
- **Efficiency**
  - ±1.0% against the Combined Variations of Line, Load and Temperature

- **Output Transient**
- **Response & Recovery**
  - Response to ± 2.0% of DC Voltage within 200 msec
  - Recovery to Steady State DC Voltage within 500 msec
- **Output Current Limit**
  - 110% of Rated Load, Adjustable from 90% to 120% of Rated Load
- **Output Ripple and Electrical Noise**
  - Unfiltered: <3% RMS (Three-Phase)
  - Filtered: <3% mVrms
  - <1% RMS (Single-Phase)

**Environmental**
- **Temperature**
  - Operating Ambient: 0° C to 50° C
  - Storage Temperature: -40° C to 85° C
- **Humidity**
  - Relative Humidity: 5% to 95% (without condensation)
- **Noise**
  - Audible Noise: <65 dBA at 5 ft.
- **Ventilation**
  - 6–300ADC: Convection Cooling
  - 400–600ADC: Force Cooling
- **Heat Loss**
  - 70–23,600 BTU/hr.
- **Size**
  - 18.25”–58”W
  - 15”–80”H
  - 12.125”–30”D
- **Weight**
  - 80–1,950 lbs.

**SCR Battery Charger DC Output Table**

<table>
<thead>
<tr>
<th>VDC Nominal</th>
<th>Float Adjustment Range (VDC)</th>
<th>Equalize Adjustment Range (VDC)</th>
<th>ADC Size Cell Available (1)</th>
<th>Lead-Acid Cell Capability (2) (No. of Cells)</th>
<th>Ni-Cad Cell Capability (3) (No. of Cells)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>10.5–12.5</td>
<td>11.5–14.5</td>
<td>8 to 100</td>
<td>5–6</td>
<td>5–10</td>
</tr>
<tr>
<td>24</td>
<td>23–30</td>
<td>24.5–32</td>
<td>6 to 100</td>
<td>11–13</td>
<td>17–20</td>
</tr>
<tr>
<td>48</td>
<td>46–60</td>
<td>48.5–64</td>
<td>6 to 100</td>
<td>22–26</td>
<td>27</td>
</tr>
<tr>
<td>130</td>
<td>115–140</td>
<td>124–150</td>
<td>6 to 50</td>
<td>55–62</td>
<td>63</td>
</tr>
<tr>
<td>260</td>
<td>230–280</td>
<td>245–300</td>
<td>6 to 25</td>
<td>110–124</td>
<td>126</td>
</tr>
</tbody>
</table>

(1) The discrete ADC sizes offered within the ranges listed above are 6, 12, 16, 20, 25, 30, 35, 40, 50, 60, 75, 100, 125, 150, 175, 200, 250, 300, 400, 500, 600ADC.

(2) The Lead-Acid Cell capacities given above are based on normal float of 2.15 to 2.35V/Cell at 25°C and equalize of 2.25 to 2.4V/Cell.

(3) The Ni-Cad Cell capacities given above are based on normal float of 1.35 to 1.45V/Cell at 25°C and equalize of 1.50 to 1.60V/Cell.

* Measured when connected to a battery with an 8-hour, Amp-Hour rating of four times the full load current rating of the charger.

To order the CyberWave RBE II, please contact your T&B sales representative.
**Float Battery Chargers**

**CyberWave RBE II — Three-Phase or Single-Phase (Digital)**

**Design Features**

**Modular Construction**
- Rectifier, microprocessor control, input/output, power transformer, filter and alarm assemblies are all modular and easily replaceable

**30-Year Life**
- All chargers are engineered for greater than 30-year life with a MTBF of 100,000 hours

**Trouble Diagnosis: Less than 60 Minutes**
- Trouble diagnosis and repair in an MTTR of less than 60 minutes
- All service can be performed from front of opened unit without disturbing chassis or installed conduit

**Flexible Installation**
- All chargers can be floor mounted
- Chargers in Style 5018 enclosure can be wall or rack mounted

**Fast, Online Adjustment**
- Control, alarm and operating level set points are adjusted digitally from the front panel while on line, without the need to vary loads or external conditions

**Engineered for Safety and Acceptance**
- The battery charger is designed and tested for worldwide applications
  - Meets NEMA PE 5-1996 specification for utility-type battery charger
  - NEMA 1/IP20 type standard enclosure
  - Meets FCC requirements for part 15 subclass J class A
- Agency approvals (for models in Style 5018 and Style 5030 enclosures only):
  - CSA C22.2 Certified
  - Complies with UL® 1012 battery charger and UL 1564 power supply specifications via CSA-NRTL/C listing
  - CE/IEC Compliant
  - Seismic Zone 4 qualified Style 5018 enclosure

**Applications**
- Power Generation
- Substations
- Microwave Relay Sites
- Switchgear
- Emergency DC Power
- DC Operated Breakers
- Alarm Systems
- Uninterruptible Power Systems
- DC Control Systems
- Signal Systems

---

**Float Battery Chargers**

**CyberWave RBE II — Three-Phase or Single-Phase (Digital)**

**Design Features**

**Modular Construction**
- Rectifier, microprocessor control, input/output, power transformer, filter and alarm assemblies are all modular and easily replaceable

**30-Year Life**
- All chargers are engineered for greater than 30-year life with a MTBF of 100,000 hours

**Trouble Diagnosis: Less than 60 Minutes**
- Trouble diagnosis and repair in an MTTR of less than 60 minutes
- All service can be performed from front of opened unit without disturbing chassis or installed conduit

**Flexible Installation**
- All chargers can be floor mounted
- Chargers in Style 5018 enclosure can be wall or rack mounted

**Fast, Online Adjustment**
- Control, alarm and operating level set points are adjusted digitally from the front panel while on line, without the need to vary loads or external conditions

**Engineered for Safety and Acceptance**
- The battery charger is designed and tested for worldwide applications
  - Meets NEMA PE 5-1996 specification for utility-type battery charger
  - NEMA 1/IP20 type standard enclosure
  - Meets FCC requirements for part 15 subclass J class A
- Agency approvals (for models in Style 5018 and Style 5030 enclosures only):
  - CSA C22.2 Certified
  - Complies with UL® 1012 battery charger and UL 1564 power supply specifications via CSA-NRTL/C listing
  - CE/IEC Compliant
  - Seismic Zone 4 qualified Style 5018 enclosure

**Applications**
- Power Generation
- Substations
- Microwave Relay Sites
- Switchgear
- Emergency DC Power
- DC Operated Breakers
- Alarm Systems
- Uninterruptible Power Systems
- DC Control Systems
- Signal Systems
Float Battery Chargers

**Standard Features**

- 1% digital LED meter for VDC, ADC, timer hours and alarm settings
- AC On indicating light
- AC input and DC output circuit breakers
- Float/equalize selector switch with indicating light
- Manual equalize timer (0–255 hr.) with indicating light
- AC line failure automatic equalize timer (0–255 hr.) with indicating light
- Self diagnostics
- Local or remote voltage sense with redundancy to protect against remote sense failure
- High DC voltage shutdown (HVSD)
- Reverse polarity protection
- Front panel controls can be disabled for security
- MOV surge suppressors, input and output
- Cu/Al I/O compression lugs
- Switchboard insulation system number-coded wiring
- Membrane front panel
- ANSI 61 epoxy powder coat finish
- Alarm assembly with local LEDs and summary relay contact for AC failure, DC failure, high VDC, low VDC, positive and negative ground fault
- Redundant analog circuit for summary alarm operates on low DC voltage, independent of microprocessor
- Custom parts data package and production test data reports shipped with each unit
- User-friendly operating manual with standard drawings
- Quick setup sheet

**Options and Accessories**

**Three-Phase and Single-Phase**

- DC output filter per NEMA PES 1996: 30 mVrms with battery (12/24/48VDC), 100 mVrms with battery (130VDC)
- Battery eliminator filter
- Medium or high AIC circuit breakers
- AC input lightning arrester
- Fungus proofing (tropicalization)
- Static proofing
- Enclosure drip shield
- External temperature compensation (tempco) via remote probe
- Relay rack mounting (Style 5018 only)
- Padlock with hasp for front panel door
- Cabinet heater assembly
- NEMA 4/12 type enclosure with fan

**Three-Phase Only**

- Auxiliary alarm relay PC board (two form C contacts for all alarms, solderless compression terminals, contact rating is .5A @ 125VAC/VDC, accepting #22–#14 AWG wire)
- Copper ground pad (with Cu/Al compression lug)
- Wall mounting (Style 5018 only)
- Communications module for DNP3 Level 2 or Modbus protocols
- Forced load-sharing module (for two units of identical rating only)

**Single-Phase Only**

- Individual alarm contacts for each of the alarms
- Ground pad with #4 AWG lug
- Floor stand

**ENCLOSURE DIMENSIONS**

<table>
<thead>
<tr>
<th>CABINET STYLE</th>
<th>5018</th>
<th>5030</th>
<th>163</th>
<th>198</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>HH</td>
<td>37.95 (964)</td>
<td>54.25 (1378)</td>
<td>62.00 (1575)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>WW</td>
<td>20.90 (531)</td>
<td>30.00 (762)</td>
<td>42.00 (1067)</td>
</tr>
<tr>
<td></td>
<td>(mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>MD</td>
<td>16.77 (426)</td>
<td>19.14 (486)</td>
<td>24.00 (610)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>(mm)</td>
<td>18.50 (470)</td>
<td>27.90 (710)</td>
<td>40.00 (1016)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.00 (229)</td>
<td>15.00 (381)</td>
<td>18.00 (457)</td>
</tr>
</tbody>
</table>

United States
Tel: 901.252.8000
800.816.7809
Fax: 901.252.1354

Technical Services
Tel: 888.862.3289

www.tnb.com
Float Battery Chargers

Options and Accessories for Microprocessor Control Battery Charger
- Lightning arrester
- Medium interrupting capacity circuit breakers
- High interrupting capacity circuit breakers
- Temperature compensation
- Drip shield
- NEMA 4/12/13 enclosure
- Cabinet heater
- Padlock for front panel
- Standard output filtering
- Battery eliminator filtering
- Auxiliary relay PC board
- Ground pad
- Fungus proofing
- Forced load sharing
- Rackmount brackets
- Communications option

<table>
<thead>
<tr>
<th>Product Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC Input</strong></td>
</tr>
<tr>
<td>Voltage</td>
</tr>
<tr>
<td>Input Voltage Tolerance</td>
</tr>
<tr>
<td>Input Frequency Tolerance</td>
</tr>
<tr>
<td>Power Factor</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DC Output</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Ratings</td>
</tr>
<tr>
<td>Current Ratings</td>
</tr>
<tr>
<td>Continuous Ratings</td>
</tr>
<tr>
<td>Voltage Regulation</td>
</tr>
<tr>
<td>Electrical Noise/Ripple</td>
</tr>
<tr>
<td>Surge Withstand Capability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Ambient</td>
</tr>
<tr>
<td>Operating Altitude</td>
</tr>
<tr>
<td>Relative Humidity</td>
</tr>
<tr>
<td>Audible Noise</td>
</tr>
</tbody>
</table>

To order the CyberWave RBE II, please contact your T&B sales representative.
CyberWave ISS

CyberWave ISS, the world’s first digitally controlled Inverter/Static Switch System for custom applications, combines Cyberex’s hallmark rugged electrical design with the versatility of digital signal processors, field-programmable gate arrays and EPROM’s to set a new standard in ISS performance and reliability for industrial applications. CyberWave ISS has standard features no other ISS manufacturer can match, including real-time voltage harmonic control and the world’s first VGA, full-color touch-screen 8” x 11” control panel (PowerPad). In addition, every CyberWave ISS incorporates Cyberex’s patented Digital Static Transfer Switch design for increased system redundancy and reliability.

Features
- IGBT-based PWM inverter
- Full digital controls with DSPs
- Full isolation output transformer
- Full-color touch-screen monitor panel
- RS-232 communications port
- Bidirectional fully rated static switch
- Maintenance bypass switch
- Fiber optic datapaths
- Surface-mount PCB technology

Hardware Configuration Summary

<table>
<thead>
<tr>
<th>System</th>
<th>Input DC Input Disconnect</th>
<th>Inverter</th>
<th>Inverter Input CB (Non-Auto)</th>
<th>Inverter PWM Inverter (PWM=3)</th>
<th>Internal IGBT Fuses</th>
<th>Inverter Isolation Transformer</th>
<th>Inverter Output CB (Non-Auto)</th>
<th>Bypass CB</th>
<th>Bypass Isolation Transformer</th>
<th>Bypass Voltage Regulator</th>
<th>Maintenance Bypass Switch</th>
<th>Bypass System Output CB (Non-Auto)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>M2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>M3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* When alternate line transformer is needed, Cyberex recommends an M2 or M3 configuration

Inverter

Isolation Transformer
Standalone Inverter Systems

Product Specifications

<table>
<thead>
<tr>
<th>METERING</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Input Voltage (A, B, C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Input Current (A, B, C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V (RMS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current (RMS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage (RMS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current (RMS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Power (W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apparent Power (VA)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Loading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Phase Difference</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| ALTERNATE LINE |    |    |    |
| Input Voltage |    |    |    |
| Input Frequency |    |    |    |

| NUMBER OF METERS | 7 | 13 | 16 |

<table>
<thead>
<tr>
<th>EVENTS/ALARMS</th>
<th>PARAMETERS</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td>DC Input CB Open</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>DC Input Fuse Blown</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>DC Bus OK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DC Ground Fault Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DC Ground Fault Negative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DC Input Available/Failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DC Input Voltage High/Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DC Input Current High</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>

| BYPASS        | Alternate Line OK |    |    |    |
|               | Alternate Line Fail |    |    |    |
|               | Sync Loss |    |    |    |
|               | STS on Alternate |    |    |    |
|               | STS on Preferred |    |    |    |
|               | Alt Line CB Open | Optional | Optional | Optional |

| OUTPUT        | Load on Inverter |    |    |    |
|               | Load on Bypass |    |    |    |
|               | STS on Preferred |    |    |    |
|               | STS on Bypass |    |    |    |
|               | Output to Ground Fault |    |    |    |
|               | Output Failure |    |    |    |
|               | MBS in Normal Position |    |    |    |
|               | MBS in Bypass |    |    |    |
|               | MBS in Bypass Isolate |    |    |    |
|               | STS Output CB Open | Optional | Optional | Optional |
|               | Emergency Power OFF | Optional | Optional | Optional |

| GENERAL       | Inverter/Rectifier Normal |    |    |    |
|               | MBS Position |    |    |    |
|               | Summary Alarm |    |    |    |
|               | Fan Failure |    |    |    |
|               | Cabinet Overtemperature |    |    |    |

| OTHER         | Event Log |    |    |    |
|               | STS Test |    |    |    |
|               | Mic Panel |    |    |    |

ENVIRONMENTAL SPECIFICATIONS

- Acoustical Noise Level: Less Than 60dBA at 3 Feet
- Operating Temperature: 0–40°C, 0–50°C Optional
- Relative Humidity: 0–95% Non-Condensing
- Access: No Rear or Side Access Required for Operation or Maintenance
- Cooling: Forced Air; Optional Redundant Fan Assemblies
- Operating Altitude: Up to 1000m with No Derating Load
- Standard Paint: Light Gray ANSI 61 Option: Cyberex White

DC Input Rating

- DC Voltage: Standard 240VDC, 120VDC Optional
- Input Voltage: Nominal Voltage +10% and -20%

AC Output Rating

- Inverter Power: Rated at 0.8 Power Factor
- Voltage: 120V, 240V Optional (International Voltages Available)
- Voltage Adjustability: +5% of Nominal
- Voltage Regulation: < +1.5% Steady State for 0–100% Load Change
- Transient Response: < +5% for a 100% Load Step
- AC Input Power: < +5% for Manual Transfer to Bypass and Back @ 100% Load
- Voltage Recovery: Return to within +2.5% of Nominal Value within 16 milliseconds (One Cycle)
- Voltage Distortion: Linear Loads: <2% at Full Load
- Non-Linear Loads (Crest Factor = 3:1): Max 5% at Full Load
- Overload: Inverter Up to 150% of Rated Output Power for 15 Minutes at Min. DC Bus and Input Voltage at 40°C
- Overload: Static Bypass 10–20kVA: 1193A RMS Symmetrical with XL/R = 15 for One Loop
  25–30kVA: 1491A RMS Symmetrical with XL/R = 15 for One Loop
  40–75kVA: 5321A RMS Symmetrical with XL/R = 15 for One Loop
- Frequency: 60 Hz Nominal, 50 Hz Optional
- Frequency Stability: +1% Free Running
- Frequency Slew Rate: 1.0 Hz/Sec. Maximum

Product Standards

- UL® 1778, ETL, CSA, CE & Seismic Zone 4 Compliances Available
- FCC Part 15 Subpart J Class A Compliant
- Year 2000 Compliant
- In Accordance with NEMA and IEC Product Standards
Stand-alone Digital Static Transfer Switches

Digital Static Transfer Switch

Cyberex’s single-phase stand-alone Digital Static Transfer Switch (DSTS) increases overall electrical system reliability by adding redundancy where it counts most — at the point of use. This single-phase stand-alone DSTS is ideal for rugged industrial applications such as oil platforms, petrochemical processing applications and power generation plants. It features Modbus communications for remote monitoring of alarms, system status and setpoints enabling users to select the stand-alone DSTS preferred source from a host computer.

Backed by Cyberex’s 40-year history of single-phase DSTS design, this stand-alone DSTS features an exclusive solid-state design for longevity and reliability.

Features
• SuperSwitch design
• 1/4 cycle break-before-make transfers
• Redundant logic and gate drive power supplies
• CMOS logic and DSP implementation for high-speed sensing and transfers
• Rugged, high-reliability SCR devices eliminate potential mechanical failures
• Internal fiber optics for high reliability
• Integral maintenance bypass
• Redundant fans
• Modbus RS-232 communications

Options
• Remote setpoint adjustments
• Operating temperature up to 50° C
• Various service access
• Enhanced enclosure

100A
200A
400A
600A
800A
**Standalone Digital Static Transfer Switches**

### Product Specifications

#### Electrical Characteristics

- **Ampacity**: 100–800A
- **Voltage**: 120VAC
- **Interrupt Rating**: 65A
- **# Poles**: 1-Pole
- **Frequency**: 60 Hz

#### Operational Characteristics

- **Transfer**: Automatic or Manual
- **Auto Transfer**: 4 ms (or less)
- **Controls**: Preferred Select, Transfer: 2 ms, Retransfer Control, Alarm Silence, Mode Control
- **Temperature**: 0–40°C
- **Humidity**: 0–95% Non-Condensing
- **Audible Noise**: < 50 dBA at 1 Meter
- **Alarm Relays (Programmable)**: Source 1, Source 2, Manual Mode, Auto Re-Transfer Off, Critical Alarm, Summary Alarm

#### User Interface

- **Status Indicators**
  - Source 1 (Available)
  - Source 1 (Preferred)
  - Source 2 (Available)
  - Source 2 (Preferred)
  - On Source 1
  - On Source 2
  - Output Available
- **Indicators (LEDs)**
  - Source 1 (Available)
  - Source 1 (Preferred)
  - Source 2 (Preferred)
  - On Source 1
  - On Source 2
  - Output Available
  - Re-Transfer Off
  - Source 2 (Preferred)
  - Manual Mode Active
  - Fan Failure
  - Transfer Inhibited
  - Summary Alarm

#### Alarms

- Fan Fail
- Over-Temperature
- Manual Mode
- Re-Transfer Off
- Surge Device Fail
- Output Unavailable
- Loss of Internal Comm.
- Open SCR Source 1
- Summary Alarm

#### Standards

- NEMA (All Applicable Standards)
- Designed to UL® 1008

### Typical Applications

- **UPS (I)**
- **UPS (II)**
- **Cyberex® DSTS**
- **UPS (I) Load**
- **Highly Critical Load**
- **UPS (II) Load**

### Ordering Information

<table>
<thead>
<tr>
<th>CAT. NO.</th>
<th>AMPS</th>
<th>VOLTS</th>
<th>DIM. (W x D x H)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSFO-10100-126-120-6N065</td>
<td>100A</td>
<td>120V</td>
<td>25&quot; x 34&quot; x 77&quot;</td>
<td>1000 lbs.</td>
</tr>
<tr>
<td>DSFO-10200-126-120-6N065</td>
<td>200A</td>
<td>120V</td>
<td>25&quot; x 34&quot; x 77&quot;</td>
<td>1200 lbs.</td>
</tr>
<tr>
<td>DSFO-1400-126-120-6N065</td>
<td>400A</td>
<td>120V</td>
<td>25&quot; x 34&quot; x 77&quot;</td>
<td>1400 lbs.</td>
</tr>
<tr>
<td>DSFO-10600-126-120-6N065</td>
<td>600A</td>
<td>120V</td>
<td>25&quot; x 34&quot; x 77&quot;</td>
<td>1500 lbs.</td>
</tr>
<tr>
<td>DSFO-10800-126-120-6N065</td>
<td>800A</td>
<td>120V</td>
<td>37&quot; x 34&quot; x 77&quot;</td>
<td>1600 lbs.</td>
</tr>
</tbody>
</table>
Power Distribution Systems

100–400A Industrial Distribution Module

Today’s industrial applications require the most technologically advanced support systems to ensure state-of-the-art power quality needs. The Cyberex® IDM provides the flexibility to expand your industrial distribution needs. Fed from your existing redundant UPS system, the IDM readily provides up to two 42-circuit output panelboards.

Features
• Industrial design includes switches, fuse and blown fuse indication for rugged application
• Easy maintenance access enables low mean time to repair (MTTR), minimizing critical load interruption
• Wall or floor mounted
• Spacious cable management for frequent wiring changes
• Top or bottom power feed entry simplifies installation for existing facility architecture
• System monitoring includes a relay for blown fuse indicator
• Compact footprint maximizes valuable real estate

Product Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
</tr>
<tr>
<td>Ampacity</td>
<td>100–400A</td>
</tr>
<tr>
<td>Input/Output Voltage</td>
<td>120/120VAC (contact factory for other variations)</td>
</tr>
<tr>
<td>Input/Output Phase</td>
<td>1-Phase, 2-Wire + G</td>
</tr>
<tr>
<td>Frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Type</td>
<td>Fused Switches or Breakers</td>
</tr>
<tr>
<td>Panelboards</td>
<td>Up to (2) 42-Circuit Output</td>
</tr>
<tr>
<td>Input Breaker</td>
<td>Up to (2) Input Breakers</td>
</tr>
<tr>
<td>Indication</td>
<td>Blown Fuse Indicators (Relay)</td>
</tr>
<tr>
<td>Subfeed Breakers Available</td>
<td>Contact Factory</td>
</tr>
</tbody>
</table>

| **Operating Conditions** | |
| Temperature (Operating) | 0° to 40° C |
| Temperature (Storage) | -40° to 60° C |
| Maximum Operating Altitude | 8,200 ft. (2,500m) |
| Access | Front Access Only – Wall Mounted |
| Cooling | Natural Convection Cooling |

| **Dimensions/Weight** | |
| 1 Panelboard | 2 Panelboards |
| Height 51" (129.54cm) | Height 80" (203.2cm) |
| Depth 10.5" (26.7cm) | Depth 10.5" (26.7cm) |
| Width 30" (76.2cm) | Width 60" (152.4cm) |
| Weight 250 lb. (113.40kg) | Weight 600 lb. (272.16kg) |

| **General** | |
| Hinged Dead Front Panel | |
| Single Point Ground | |
| Branch Circuit Breaker or Fused Switches | |
| Optional Additional Fuse on Hot Side | |
| Optional Circuit Monitoring | |
| Optional Transient Voltage Surge Suppression | |

| **Communications** | Modbus-485 |

| **Standards** | NEMA (All Applicable Standards) |
| FCC Compliant (Part 15) |
## Power Distribution Systems

### Catalog Numbering System

<table>
<thead>
<tr>
<th>A – Panelboard Quantity*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 Panelboard</td>
</tr>
<tr>
<td>2</td>
<td>2 Panelboards</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B – Monitoring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>L0</td>
<td>No Monitoring</td>
</tr>
<tr>
<td>L1</td>
<td>Main Voltage Indicator</td>
</tr>
<tr>
<td>L2</td>
<td>Blown Fuse Indicator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C – Amperage*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100A</td>
</tr>
<tr>
<td>200</td>
<td>200A</td>
</tr>
<tr>
<td>225</td>
<td>225A</td>
</tr>
<tr>
<td>400</td>
<td>400A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D – Input/Output Voltage*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120VAC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E – Frequency*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>60 Hz</td>
</tr>
</tbody>
</table>

* Other variations available — please contact factory.

### Model Example:

<table>
<thead>
<tr>
<th>IDM</th>
<th>1 -</th>
<th>L0 -</th>
<th>100 -</th>
<th>1 -</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

---

Power & High Voltage — Cyberex® Industrial Power Conditioning

Model Example: