The **Model 3060-MS** is a high power solid state frequency converter consisting of one to ten 50 kW/62.5 kVA, 3 phase AC Power Sources. The MS Series offers reliable voltage and frequency conversion and power monitoring for facilities power and/or AC power test applications. By adding the external SCU/UPC-32 Universal Programmable Controller, the MS Series can be operated as a fully featured programmable AC Power Source complete with arbitrary waveform generation and AC transient programming.

**Maximum System Flexibility and Reliability**

Capable of operating as either the master or slave in a multi-cabinet parallel system. Easy to reconfigure to meet changing test needs.

**Control and Monitor Panel**

The 3060-MS is equipped with simple to use front panel controls for setting output voltage and frequency. This panel also provides read back on both AC input and AC output Frequency, Voltage, Current and Power as well as diagnostic information on system status and operation. For general frequency conversion facility power applications, the front panel controls provide all necessary setting and monitoring capabilities. For AC power test and development applications, the external SCU/UPC-32 programmable controller may be added as an option.
True Advantages

Solid State Technology

Rugged, Powerful Output

- **350 Amps of Pulse Current** per phase is delivered by each 3060-MS for driving non-linear loads. This eliminates the need to oversize facility power as is common for rotary or low quality PWM power systems.
- **Load Power Factor** is not an issue. The 3060-MS will drive virtually any load without damage or risk.
- **Excellent Regulation** and response time eliminates load “cross talk.” Voltage sags common to other conversion methods are eliminated with 150 microsecond response time to a 50% load step. The output recovers to ± 3% of nominal within less than 1/10th of a cycle at 400 Hz.

Maximum Reliability

- **Each 3060-MS** is capable of operating as either the master or slave in a multi-cabinet parallel system providing configuration flexibility.
- **Mission Reliability** is ensured. The parallel system architecture is such that a failed slave unit automatically removes itself from the power grid. Should the master unit fail, the operator can select any other paralleled unit as the new master from the front panel and restore system operation.

Simple / Informative Display

- **Measures** volts, amps, watts and kVA for each input and output phase.
- **Efficiency** is continuously monitored, allowing system performance verification.
- Internal Diagnostics assist in quickly locating failed components, resulting in extremely low MTTR.
- **Power Generation** circuits are separate from display and diagnostics. A failure in the display logic will not affect output power quality. Output power cannot be interrupted by system interrogation.
- **Audible and Visual Alarms** alert the operator to any conditions requiring attention.

Low Cost of Ownership

- **Lower Maintenance Costs** are achieved through built-in diagnostics that minimize MTTR. Quick and easy repair is facilitated with a small complement of local spares.
- **Input Power Factor** is a constant 0.9 lagging, regardless of load. The MS Series actually corrects PF reflected back to the utility, eliminating PF penalties.
- **Low Installation Cost.** The MS Series fits through standard doorways. Audible noise is limited to cooling fans. There is no 400 Hz whine that requires noise isolation. Solid state design with a forklift base eliminates the need for concrete pads and vibration isolators common to rotary installations. Casters are optional if desired.

Facility/Test Power Flexibility

- **Power Levels Grow** with demand. Units may be added or removed from the power grid as required.
- **Variable Frequency** range of 47–500 Hz, as well as switch selectable fixed frequency operation of 50, 60 or 400 Hz, is standard on every model.
- **External Input** is provided as a standard feature. This allows operation as a variable frequency test power amplifier.
- **UPC-32 Programmable Controller Option** is available to provide steady state and transient control of output power from the RS-232 or GPIB bus.
**AC Output Specifications**

<table>
<thead>
<tr>
<th>POWER</th>
<th>62.5kVA/50kW for each 3060-MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE (Nominal)</td>
<td>Direct Coupled: 0-120/208 V, 3-phase External Transformer Options: Consult factory for details.</td>
</tr>
<tr>
<td>CURRENT RMS</td>
<td>175 A rms/Phase continuous PF &lt; 0.8: 175 A rms/Phase PF 1.0: 140 A rms/Phase</td>
</tr>
<tr>
<td>OVERLOAD (KW)</td>
<td>110% for 1 hour, 125% for 10 minutes, 150% for 10 seconds</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>50Hz, 60Hz or 400Hz Fixed settings 47 - 500 Hz Variable</td>
</tr>
<tr>
<td>VOLTAGE THD</td>
<td>±1% @ 50/60Hz, ±2% @ 400Hz with Automatic Gain Control (AGC) enabled</td>
</tr>
<tr>
<td>LINE REGULATION</td>
<td>±1% maximum for ±10% line voltage change</td>
</tr>
<tr>
<td>LOAD RESPONSE AND RECOVERY TIME</td>
<td>150 microseconds for 50% load step and 300 microseconds for 100% load drop.</td>
</tr>
<tr>
<td>LOAD POWER FACTOR</td>
<td>Delivers full rated kVA into any Power Factor load.</td>
</tr>
<tr>
<td>LOAD BALANCE RESTRICTION</td>
<td>None. Each phase is independently regulated</td>
</tr>
<tr>
<td>ISOLATION</td>
<td>An input transformer with an electrostatic shield provides isolation between the input and output of the system</td>
</tr>
<tr>
<td>OVER CURRENT PROTECTION</td>
<td>Integral electronic current limiting with auto recovery. Circuit Breaker is optional.</td>
</tr>
</tbody>
</table>

**Input Power Requirements**

<table>
<thead>
<tr>
<th>INPUT VOLTAGE</th>
<th>RECOMMENDED SERVICE CURRENT</th>
<th>INPUT FREQUENCY</th>
<th>POWER FACTOR</th>
<th>PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>208 VAC ±10%</td>
<td>175 A rms</td>
<td>47–63 Hz</td>
<td>0.85 lagging typical</td>
<td>Input CB Standard. Slow Turn-On Circuit is provided to limit inrush current</td>
</tr>
<tr>
<td>240 VAC ±10%</td>
<td>175 A rms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>380 VAC ±10%</td>
<td>100 A rms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 VAC ±10%</td>
<td>100 A rms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>416 VAC ±10%</td>
<td>80 A rms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>480 VAC ±10%</td>
<td>80 A rms</td>
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</tbody>
</table>

**Typical MS Options**

/G GPiB Interface, SCPI Commands & IEEE488.2 (standard) /S RS232 Interface, SCPI Commands, Baudrate up to 38.4 kbps. (Replaces GPIB, no cost option) 

UPC-Studio Windows AC Power Source control Software (no cost option) UPC Test Manager License (cost option) required for Avionics or IEC test options listed below: 

ABD0100 License for Avionics Test Sequences according to norm ABD0100.8.1. Requires UPC-Test Manager Option. 

A350 License for Avionics Test Sequences according to norm Airbus A350. Requires UPC-Test Manager Option. 

DO160 License for Avionics Test Sequences according to norm DO160 Version E - Requires UPC-Test Manager Option. 

IEC-AC-4XX IEC 61000-4 AC Immunity Test Sequences. Includes 4-11, 4-14, 4-27, 4-28 and 4-34. Excludes 4-13 Option. 

SCU/UPC32-413 IEC 61000-4-13 Inter Harmonic Generator. Required to run 4-13 tests. Includes 4-13 software. 

DRIVERS LabView™ and LabWindows™ drivers available 

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SCU-UPC32 Programmable Controller

The UPC controller is a 3-Phase AC arbitrary waveform generator and precision AC metering system. Each waveform stored in the UPC is encoded with 12-bit amplitude and 10-bit time resolution for each cycle. The waveform for each phase may be independently selected and varied in amplitude and phase angle with respect to phase A. The UPC output metering samples the output volts and amps at 512 samples per measurement using a 12-bit A/D converter. This technique provides exceptional metering accuracy and resolution (20 bits), and delivers a high-fidelity waveform back to a host computer for analysis. The UPC includes a remote GPIB interface compatible with IEEE488.2 and SCPI.

UMS Option

MS Series Battery Support Systems

With the addition of the UMS Battery Backup option, the 3060-MS can be converted to an uninterruptable Power Source (UPS). The UMS battery support system for a single cabinet UMS installation (62.5 kVA, 50 kW) consists of 30 sealed, maintenance free, immobilized electrolyte batteries installed in a Zone 4 cabinet. The UMS system DC voltage regulator provides for automatic charging of the battery system to maintain the proper float voltage.

A battery disconnect is located in the center of the battery cabinet front door. Battery support time at full load (50 kW) is approximately 15 minutes. The waveform quality at the end of the battery support time meets the requirements of MIL-STD 1399, section 300A, Types I, II and III power forms.

On-Line, No-Risk Battery Test

This feature of the UMS system provides the ability to perform a battery test on command from the front panel or RS-232 serial port. Test results are displayed on the front panel and are available over the serial port as a part of the system diagnostics. A battery failure during the test will not cause the system to drop the load or distort the output waveform.

UPC Manager Software Suite

Master the Power of the Wave!

UPC Manager Software gives you the tools necessary to quickly and easily operate your AC Power Source. With our complete, graphical interface, control all areas of your AC Power Source testing with simple presets, user prompts, test sequences, test plans and custom reports.

UPC Features

- Simple and Comprehensive programming
- Execute and Monitor the output values using the internal power analyser
- Create arbitrary waveforms, import waveforms captured on external instruments, freehand draw, enter harmonic and phase angle content, create ringwaves, random noise, clipping and other custom waveshapes.

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