

UPA-1P & 2P Q&A

The Meyer Sound Ultra Series™ UPA-P Series loudspeakers are full-range powered systems that combine exceptionally accurate reproduction with high SPL output in very compact enclosures. Evolved from Meyer's legendary UPA-C products, the UPA-P Series features true constant-Q high-frequency directivity and a uniquely robust built-in power bi-amplifier incorporating electronic crossover, driver protection and optimized pole-zero response correction circuitry.

The UPA-P Series comprises two models, each utilizing a proprietary 12-inch cone low-frequency driver and a horn-loaded 3-inch diaphragm high-frequency compression driver in a vented cabinet with carrying handles and rigging points. The UPA-1P affords 100° horizontal by 40° vertical high-frequency coverage with a remarkable new constant-Q horn that is the product of extensive empirical development in the company's high-resolution anechoic test environment. The UPA-2P provides symmetrical 45° horizontal and vertical coverage from a round-mouthed aspherical horn. Both models deliver ± 3 dB amplitude response over a frequency range of 60 Hz to 18 kHz, and $\pm 35^\circ$ phase response from 600 Hz to 16 kHz, with maximum 132.5 dB SPL capability.



PATENT PENDING

WHAT ARE THE INTENDED APPLICATIONS FOR THE UPA-P SERIES SPEAKERS?

The UPA-P Series speakers are designed to satisfy all applications requiring high-resolution, low-distortion sound quality, maximum ease of use, high reliability, portability and/or small installed cabinet size.

The UPA-1P combines wide horizontal coverage with excellent arraying characteristics and serves a very broad range of applications. For small-to-medium scale sound reinforcement and reproduction, the UPA-1P excels in main PA arrays for touring bands, live music clubs, houses of worship, multimedia playback suites and live theater. It is also ideally suited for distributed paging and announcing in sports arenas, fill systems in mid-scale PAs, keyboard and drum stage monitor systems, voice reproduction and effects channels in theme parks, and surround channels in large cinemas.

The UPA-2P is designed for applications requiring tightly controlled, narrow high-frequency coverage. Such applications include voice reinforcement for live theater, fill systems in mid-scale PAs and theatrical or theme park effects channels. The UPA-2P excels in highly reverberant environments where reflected energy must be controlled, and is very effective in voice systems for houses of worship as well as distributed arena paging systems.

WHAT KIND OF POWER AMPLIFIER DOES THE UPA-P SERIES USE?

The UPA-P Series built-in electronics package features a unique new power bi-amplifier purpose-designed for the UltraSeries. Utilizing high-current complementary-symmetry MOSFET output stages in class AB/bridged configuration with a unipolar, customized, switched-mode power supply, the amplifier package affords 350 watts per channel burst output capability while adding only about 10 lbs to the cabinet weight. The UPA-P Series amplifier has been proven in extensive field testing to be extremely reliable and virtually indestructible. By combining a relatively low-voltage (48 VDC) high-current power supply with bridged operation and low-impedance (2 ohms) drivers in a dedicated, integral system, the UPA-P Series achieves substantial advantages over conventional externally-powered systems. Bridged operation assures that common-mode signal distortion effects at the amp outputs are nulled out and, since drive current is drawn only from the supply and never returned to ground, avoids circulating



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UPA-1P & 2P *Q&A continued*

ground current problems. The low DC supply voltage permits extensive use of monolithic integrated circuit devices, resulting in a design that is at once elegantly simple and far less failure-prone than high-voltage discrete designs. Because the amplifier's operating environment and load characteristics are known by virtue of its integration with the UPA-P Series cabinet and drivers, there is no need for the complex protection circuitry that compromises both the sound quality and the reliability of conventional amplifiers.

The UPA-P Series switched-mode supply features an extraordinary 72,000 microfarads of capacitive storage to assure rock-solid supply rail in demanding, high-powered professional applications. And since the UPA-P Series electronics are designed from the ground up for unipolar 48 VDC operation, large installed systems may be configured using high-current remote DC supplies to save on wiring costs, decrease induced hum problems from distributed AC and enhance safety (contact Meyer Sound Technical Support for details).

CAN THE UPA-P SERIES AMPLIFIER BE RETROFITTED ON OLDER, NON-POWERED UPA-C'S?

No. The UPA-P Series represents a significant redesign of, and improvement on, the UPA-C Series. In particular, the UPA-1P high-frequency horn differs substantially from that of the UPA-1C, and the UPA-P Series utilizes special low-impedance drivers unique to it. Since the UPA-P Series signal processing circuitry and power stages are optimized for the new horn and driver designs, grafting the electronics onto older, non-powered units would not achieve adequate performance.

WHAT IS THE AUDIO SIGNAL INPUT CONFIGURATION OF THE UPA-P SERIES?

The UPA-1P and UPA-2P may be ordered with any of three input panel configurations (see Figure 1). The standard input panel (top) provides looping male and female three-pin XLR-style signal connectors with 24 VDC output for an external cooling fan option and indicator LEDs for power/overtemperature and high/low limit. An enhanced looping panel (middle) adds polarity switching (which does not affect the looping signal) and a rotary input attenuation control (0 dB to -12 dB range). Finally, an optional summing input configuration (bottom) replaces the male looping connector with a second female input connector; this version is used where hard-wired summing is desired (for example, to make a derived center channel or mono fill channel).

HOW SHOULD THE SIGNAL INPUT BE WIRED?

The signal input is an active differential circuit with pin 2 positive, pin 3 negative and pin 1 ground. Normal balanced signal feeds should be wired accordingly, with shield connected to pin 1. Where the mains AC supply lacks an earth conductor (such as in Japan), pin 1 may be tied to the connector shield.

As the circuit diagram on the input panel indicates, pin 1 (circuit ground) is effectively isolated from chassis (earth) at audio frequencies by a 220 kohm resistance; this effectively eliminates ground loops and the need for a ground-lift switch. This DC resistance is shunted with a small-value capacitor to eliminate RFI, and back-to-back zener diodes for high-voltage protection. Where the AC mains supply incorporates an earth conductor (recommended), pin 1 should remain isolated from the connector shield to avoid ground loops and take full advantage of the signal ground circuit's safety and noise-reduction features.

WHY IS THERE NO LO CUT SWITCH, AS WAS PROVIDED ON THE M-1A CONTROL ELECTRONICS FOR THE UPA-C?

The M-1A Lo Cut switch was designed to serve two main purposes: to limit low-frequency response for voice applications (compensating somewhat for cardioid microphone proximity effect), and to optimize the UPA-C Series products for crossover to the USW-1 or 650-R2 subwoofer.

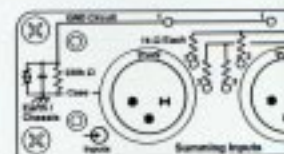
Figure 1



Standard Looping Module



VC/Polarity Module



Summery Module

In the first instance, providing such a response-tailoring facility on the rear panel of a powered product makes little sense. Once the speakers are installed, the switch is inaccessible to the system operator. Furthermore, the possibility of having successive units in an array set for different responses increases, and this is undesirable since it compromises array performance. Response tailoring is much more effectively achieved using console or outboard equalization.

In the second instance, the newly designed UPA-P crossover to its USW-1P subwoofer is already finely optimized in both amplitude and phase. Introducing a Lo Cut function on the UPA-P will therefore create an amplitude hole at crossover and increase the risk of phase cancellations. Depending upon boundary conditions, amplitude corrections near crossover may be required when the UPA-P is used with a subwoofer, but these are best effected with user-accessible parametric equalizers.

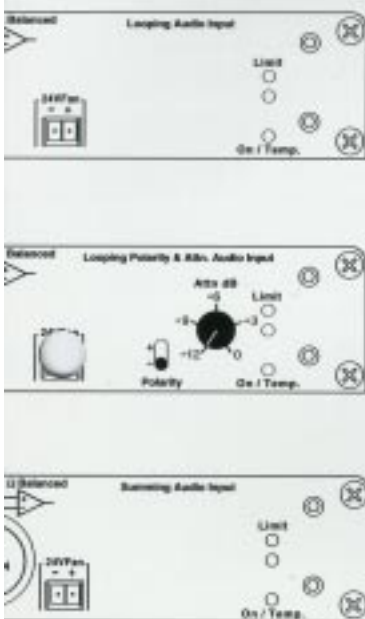
WHAT ARE THE AC POWER REQUIREMENTS FOR THE UPA-P?

The UPA-P Series requires a three-conductor (hot, neutral, earth) AC input, and its electronics package incorporates Meyer Sound's exclusive Intelligent ACTM circuitry which automatically adjusts for input mains voltages over the range of 80-264 VAC. Its AC current requirements for various nominal mains voltages and operating conditions are shown in the table of Figure 2.

Intelligent AC affords the UPA-P Series significant benefits. First, the unit is internationally compatible and, since it does not require manual AC range setting, is well protected from accidental exposure to excessive voltages. The UPA-P Series also tolerates voltage surges, faults and brownouts. Moreover, in situations where power is supplied from a delta-wye source, the electrician may pick up any two available legs (hot-neutral or hot-hot) to supply the unit and be assured that it will function without problems. Intelligent AC also suppresses high-voltage transients and provides a soft-start function to eliminate high inrush currents on power-up.

CAN UPA-P'S BE USED IN CONJUNCTION WITH OLDER, NON-POWERED ULTRA SERIES SPEAKERS?

The answer depends very much on the intended application. Intermixing UPA-P and UPA-C Series products in arrays, for example, is not advisable: the new systems differ sufficiently in coverage and sonic performance that they are not array-compatible with their non-powered counterparts. UPA-P Series products are also best supplemented with Meyer powered subwoofers rather than older, controller based Meyer subs. On the other hand, theatrical sound designers working with large, multi-channel system designs may choose for special effects to implement some channels using UPA-P Series products and others with UPA-C Series products. Just be aware that the vastly improved phase response, lower distortion and better-controlled frequency response of the UPA-P Series mean that there will be sonic differences between the old and new systems.



Current @	115 VAC	230 VAC	100 VAC
Idle	0.25 Arms	0.13 Arms	0.3 Arms
Max. Continuous (>10 sec)	2.8 Arms	1.6 Arms	3.2 Arms
Burst (<1 sec)	3.2 Arms	1.6 Arms	3.7 Arms
Max During Burst	5.0 Apk	2.5 Apk	5.8 Apk

Figure 2



Figure 3

HOW SHOULD THE UPA-P SERIES SPEAKERS BE ARRAYED?

The arraying principles that have worked so well with Meyer's earlier UltraSeries products also generally apply to the UPA-P Series. The one particular difference is that, with the UPA-1P's new constant-Q high horn, optimum wide-horizontal array performance is achieved when the gap between adjacent cabinet faces is about 12 inches (26 cm — see Figure 3). This spacing yields an extraordinarily smooth 170° of horizontal coverage.

IS THE UPA-P SERIES WEATHER-RESISTANT?

Weather-resistant versions are available; contact Meyer Sound for pricing and ordering details. Meyer Sound also offers an optional rain hood which attaches over the rear-panel electronics using the existing mounting screw locations. Fabricated of tough ABS plastic, the hood protects the electronics and connectors from rain, and its use is strongly recommended in outdoor applications.

WHAT CONSIDERATIONS AFFECT COOLING AND OVERHEATING OF THE ELECTRONICS?

The UPA-P Series amplifier and power supply can generate moderate amounts of heat in operation, and this energy needs to be dissipated in air to avoid overheating. Under most conditions the massive heatsink area and internal fan are more than sufficient to the task, but environmental factors can hinder their operation and/or overrun their capabilities. The heatsink relies on convection cooling. Higher ambient air temperatures can degrade the effectiveness of the convection cooling, as can exposure to sunlight or other radiant heat. The heatsink and electronics can safely operate quite hot, but when the heatsink temperature exceeds 85° C (185° F), thermal limiting circuits will lower the protection limiter thresholds by 6 dB (this is indicated by the rear-panel Power LED turning red). The over-temperature protection circuit is self-resetting when the heatsink temperature cools to 75° C (167° F).

To maximize cooling efficiency, always allow several inches of clearance behind and above the cabinet to allow for adequate air flow and avoid prolonged exposure to high ambient air temperatures or radiant heat sources. If the unit must be installed in a restricted space, or operated for long periods at maximum output in hot environments, then the optional fan kit should be used. The fan derives power from the electronics package and is mounted on the cabinet rear face so as to dramatically increase cooling air flow over the heatsink.

WHAT INTERNATIONAL SAFETY STANDARDS DOES THE UPA-P SERIES SATISFY?

The UPA-P Series complies with UL, IEC 65 and effectively all international standards. In addition, it meets the requirements of the European Union's new EN 55103-1 and EN 55103-2 Electromagnetic Compatibility Emission and Immunity standards for professional-use audio apparatus. These strict new EU standards cover a comprehensive range of disturbance phenomena, including RF electromagnetic fields, magnetic fields, power supply harmonic currents, AC port voltage fluctuations and inrush currents.

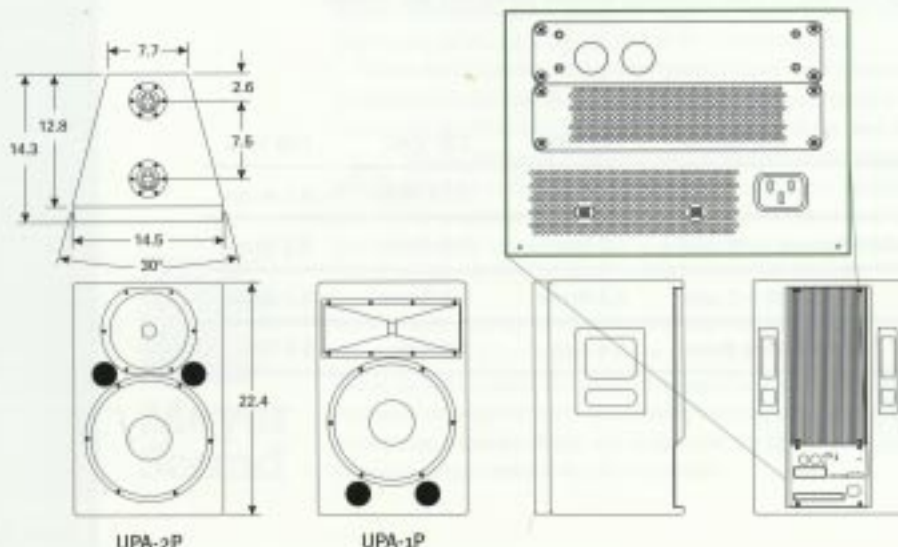
Meyer Sound Laboratories has devoted itself to designing, manufacturing and refining components that deliver superb sonic reproduction. Every part of every component is designed and built to exacting specifications and undergoes rigorous, comprehensive testing in the laboratories.

Research remains an integral, driving force behind all production.

Meyer strives for sound quality that is predictable and neutral over an extended lifetime and across an extended range.

UPA-1P & 2P PHYSICAL DIMENSIONS

ALL UNITS IN INCHES



UPA-1P/2P 01.076.073.01A

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