

2014

Ultrasonic Vibrating Platform & Driving Amplifier

User's Guide



IMPORTANT SAFETY NOTICE



- The Power Amplifier can produce hazardous voltages and currents which may be harmful or even deadly. Safety measures should be taken accordingly.
- The amplifier system is only suitable for indoor use in a class II environment (domestic, light industrial).
- Only use this appliance with a mains connection with protective earth.
- The internal circuitry of the amplifier operates at high voltage. Only qualified personnel from MP Interconsulting or SonicDiagnostic should service this amplifier.
- **"Do Not Cover"** the amplifier case to avoid overheating.
- Do not insert or allow foreign objects to enter any ventilation or exhaust opening, as this may cause an electrical shock, fire or damage to the amplifier.

INSTALLATION AND SETUP

Please watch the video clip that shows the installation procedure step-by-step:

<http://www.youtube.com/watch?v=sB9GLVhmkJo>

To operate the device, you need the following parts/devices:

1. Power Amplifier + 3 BNC cables
2. Vibrating Platform including the transducer + cable
3. Protective load + cable
4. Function Generator
5. Oscilloscope



1. Switch off the amplifier, connect the power cable to mains power supply with earth connection.
2. Connect the Function Generator to mains power supply.
3. Connect the Function Generator output to both Amplifier Input and Oscilloscope CH1.
4. Connect the "Voltage Monitor" to Oscilloscope CH2.
5. To control the Input / Output levels, turn on all devices and apply a sinusoidal voltage (10kHz, 5V). The "Voltage Monitor" should be equal to the Input Signal. You may increase the input amplitude up to 10V. Always check the Voltage Monitor signal not to be saturated.
6. Note that the real output of the amplifier is 20 x "Voltage Monitor". The connectors labeled "Output Voltage" and "Protective Load" are hazardous and may be harmful or lethal. Use caution and preventive safety measures to prevent contact between these high voltages and personnel.
7. Now turn off the Function Generator and Power Amplifier.
8. Connect the Protective Load, Turn it off. Do not cover the case of the Protective Load. Do not insert any object, inside the case, and keep it in a safe and dry place.
9. Connect the Amplifier Output to the Transducer.
10. Turn on the Power Amplifier and Function Generator. Check the monitor voltage levels to be in the range (not to be saturated). It is better to reduce the amplitude, and then gently increase it to the required level.
11. Turn on the switch on the Protective Load. Now the Vibrating Platform is operating.

12. You may change the frequency/amplitude for your experiments.
13. At some modal frequencies (e.g.: 17.5 kHz) the Protective Load (Lamp) turns on. In this case, you can enable sweeping mode on the function generator (for example 17.5 ± 0.2 kHz), until the lamp turns off.

POWER AMPLIFIER SPECIFICATIONS

| | |
|--------------------------------------|---|
| Model | PA-196-4-V |
| Output Voltage | ±196 V (392 Vpp) |
| Output Current | 4 A (continuous), 10 A (pulse) |
| Gain | 20 V/V |
| Dissipation | 150W Max. |
| Output Power | 300 W Max |
| Slew Rate ($R_L = 100 \Omega$) | 50 V/ μ S * |
| Power Bandwidth @Max. Output Voltage | 50 kHz * |
| Voltage Monitor Ratio | 1/20 V/V (Range: ±10 V, Impedance: 2 k Ω) |
| Input Voltage Range | ±10 V |
| Input Impedance | 10 k Ω |
| Supply Voltage | 100 to 240 V, 50 to 60 Hz |
| Connectors | BNC |
| Casing | Rack mount 3U |

* Max. Slew Rate (SR_{Max}) for capacitive loads is limited by $SR_{Max} < I_{Max} / C_L$. For example, given a capacitive load $C_L = 100nF$, and $I_{Max} = 2 A$ (Model PA-180-2-V), then $SR_{Max} < 20 V/\mu S$.

* Power Bandwidth (BW_P), Slew Rate and peak-to-peak sine wave output (V_{pp}) are related by $SR = \pi BW_P V_{pp}$. For example, given $SR = 60 V/\mu S$ and $V_{pp} = 180V$, the Power Bandwidth is 106 kHz.