



8101

Operator's Manual

*Advanced Switch-Mode Design Power Supply Amplifier
for Pulse or Continuous Duty Operation*

Limited One-Year Warranty

SUMMARY OF WARRANTY

AE TECHRON INC., of Elkhart, Indiana (Warrantor) warrants to you, the ORIGINAL COMMERCIAL PURCHASER ONLY of each NEW **AE TECHRON INC.** product, for a period of one (1) year from the date of purchase, by the original purchaser (warranty period) that the product is free of defects in materials or workmanship and will meet or exceed all advertised specifications for such a product. This warranty does not extend to any subsequent purchaser or user, and automatically terminates upon your sale or other disposition of our product.

ITEMS EXCLUDED FROM WARRANTY

We are not responsible for product failure caused by misuse, accident or neglect. This warranty does not extend to any product on which the serial number has been defaced, altered, or removed. It does not cover damage to loads or any other products or accessories resulting from **AE TECHRON INC.** product failure. It does not cover defects or damage caused by the use of unauthorized modifications, accessories, parts, or service.

WHAT WE WILL DO

We will remedy, at our sole discretion, any defect in materials or workmanship by repair, replacement, or refund. If a refund is elected, you must make the defective or malfunctioning component available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at our factory. Expenses in remedying the defect will be borne by **AE TECHRON INC.**, including one-way surface freight shipping costs within the United States. (Purchaser must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

When you notify us of your need for warranty service, we will give you an authorization to return the product for service. All components must be shipped in a factory pack or equivalent which, if needed, may be obtained from us for a nominal charge. We will take corrective actions within a reasonable time of the date of receipt of the defective product. If the repairs made by us are not satisfactory, notify us immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

You are not entitled to recover from us any consequential or incidental damages resulting from any defect in our product. This includes any damage to another product or products resulting from such a defect.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this warranty. The warranty is not extended by the length of time for which you are deprived of the use of this product. Repairs and replacement parts provided under the terms of this warranty shall carry only the unexpired portion of this warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

There is no warranty that extends beyond the terms hereof. This written warranty is given in lieu of any oral or implied warranties not contained herein. We disclaim all implied warranties, including, without limitation, any warranties of merchantability or fitness for a particular purpose. No action to enforce this Warranty shall be commenced later than ninety (90) days after expiration of the warranty period.

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Table of Contents

1 Introduction	5
1.1 Features.....	5
2 Amplifier Setup	6
2.1 Safety First.....	6
2.2 Unpacking.....	6
2.3 Installation.....	6
2.4 Choose Input Wire and Connectors	7
2.5 Choose Output Wire and Connectors.....	7
2.6 Wiring Your System	8
2.7 Connecting the AC Supply.....	10
2.8 Start-up Procedure.....	11
3 Amplifier Operation	12
3.1 Precautions.....	12
3.2 Front-Panel Controls and Indicators	12
3.3 Back-Panel Controls and Connectors.....	13
4 Advanced Features and Options	14
4.1 Protection Systems	14
4.2 Advanced Features	14
5 Maintenance	16
6 Troubleshooting	17
6.1 Factory Service	19
7 Specifications	20
7.1 Performance	20
7.2 Output Power	21
7.3 Performance Graphs.....	22
7.4 Power Draw and Thermal Dissipation	23

List of Figures

Figure 1.1 – 8101 Front Panel.....5
 Figure 2.1 – Airflow7
 Figure 2.2 – Balanced Input Connector Wiring7
 Figure 2.3 – Unbalanced Input Connector Wiring.....7
 Figure 2.4 – Removing Barrier-strip Cover7
 Figure 2.5 – Typical Output Connector Wiring.....8
 Figure 2.6 – System Wiring, Dual Configuration8
 Figure 2.7 – System Wiring, Bridge-Mono Configuration.....9
 Figure 2.8 – System Wiring, Dual Configuration with “Y” Input..... 10
 Figure 3.1 – 8101 Front-Panel Controls and Indicators..... 12
 Figure 3.2 – 8101 Back-Panel Controls and Connectors..... 13
 Figure 4.1 – Input Sensitivity Switches Location 15
 Figure 4.2 – Attenuation vs. Detent of Level Controls 15
 Figure 6.5 – Typical Crosstalk vs. Frequency 22
 Figure 6.4 – Typical Frequency Response..... 22
 Figure 6.6 – Typical Dampening Factor vs. Frequency 23
 Figure 6.7 – Power Draw and Thermal Dissipation..... 23

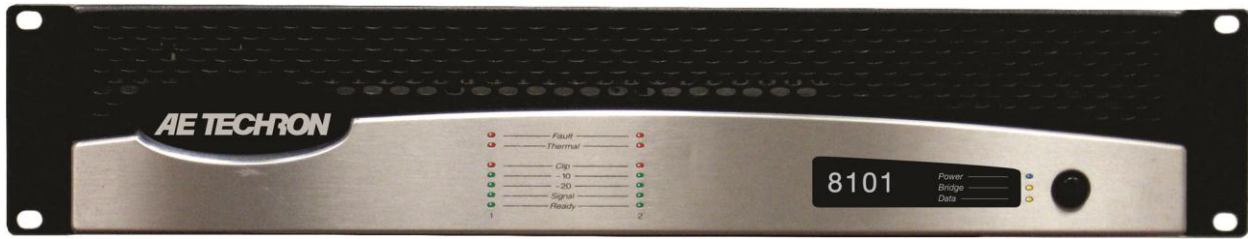


Figure 1.1- 8101 Front Panel

1 Introduction

Congratulations on your purchase of the 8101 AE Techron power supply amplifier, featuring an advanced switch-mode design that result in low noise and distortion and high power density. The 8101 amplifier is built and tested to the most stringent quality standards for long life and outstanding performance. The AE Techron brand is known throughout the world for its robust precision amplifiers as well as its product service and support.

1.1 Features

The 8101 amplifier is configured as a dual-channel, AC-coupled, controlled voltage amplifier ideal for reactive loads. It can be used for both pulse and continuous duty applications. Other features include:

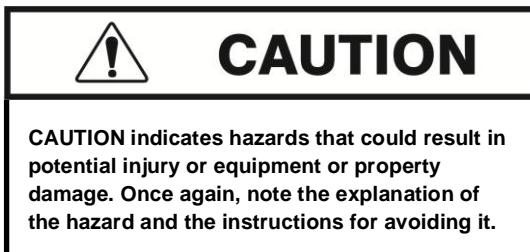
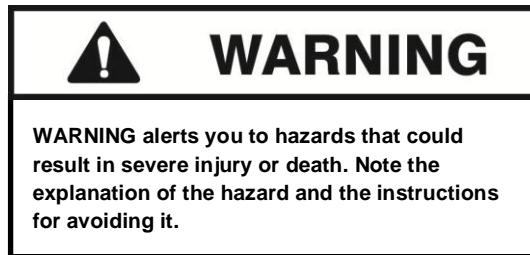
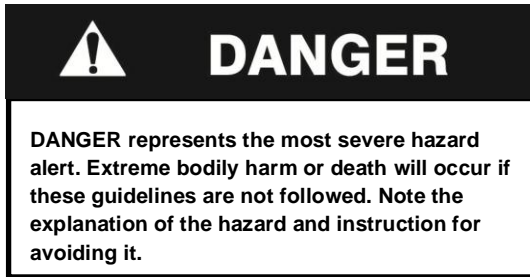
- Up to 16 Arms and 139 Vrms continuous output.
- Frequency bandwidth at full power of 10 Hz - 20 kHz.
- Compact design; only 2U of rack space and 27 lbs.
- Switching, power supply for reduced weight.
- Installs easily into a standard 19-inch rack or stands alone for bench top operation.
- Built-in protection circuitry safely provides for sustained high-power output, with protection against input overloads, improper output connection (including shorts and improper loads), and excessive temperature, voltage or current.
- Operates from single-phase, 120-volt AC mains, (230 VAC version available).

2 Amplifier Setup

The 8101 amplifier is a precision instrument that can be dangerous if not handled properly. Lethal voltages are present in both the AC input supply and the output of this amplifier. For this reason, safety should be your primary concern when you setup and operate this amplifier.

2.1 Safety First

Throughout this manual special emphasis is placed on good safety practices. The following graphics are used to highlight certain topics that require extra precaution.



2.2 Unpacking

All amplifiers are tested and inspected for damage before leaving the factory. Carefully unpack and inspect the amplifier for damage. Please note any damage for future reference and notify the shipping company immediately if damage is found.

Also, please save the shipping carton and materials as evidence of damage and/or for returning the amplifier for repair.

Along with any additional accessories purchased by the customer, all 8101 amplifiers ship with the following:

1. 8101 Amplifier
2. Standard IEC 15-amp power cord
3. 8101 Operator's Manual CD and Quick Setup Sheet

After unpacking and inspection of the product, packing materials should be saved, if possible, for later use in transporting or shipping the unit, or replacement packing materials are available from AE Techron. **NOTE: Never ship this unit without proper packaging.**


2.3 Installation

The 8101 amplifier has rack "ears" on each side of the front panel for mounting to a standard EIA (Electronic Industries Association) rack. Use standard rack mounting hardware to mount the amplifier.

NOTE: The 8101 amplifiers weigh approximately 27 pounds. Be sure this weight is properly supported using all the screw locations.

For optimum cooling and rack support, multiple units should be stacked directly on top of each other. Close any open spaces in rack with blank panels. DO NOT block front or rear air vents. The side walls of the rack should be a minimum of two inches (5.1 cm) away from the amplifier sides, and the back of the rack should be a minimum of four inches (10.2 cm) from the amplifier back panel.





CAUTION

Before you begin, make sure your amplifier is disconnected from the power source, with power switch in the OFF position and all level controls turned completely down (counter-clockwise).

When mounting the amplifier in a rack cabinet, the back wall of the rack should be at least 3 inches (7.6 cm) away from the back of the amplifier chassis as shown in **Figure 2.1**. Allow for hot air discharge through the amplifier's rear grill. If your cabinet has a rear door, you must provide adequate airflow through the door. Provide a source of cool air for fan intakes. If the rack is crowded or rack ventilation is poor, use a vent tube to the outside of the rack. **See Section 6, Specifications**, for detailed information on thermal dissipation.

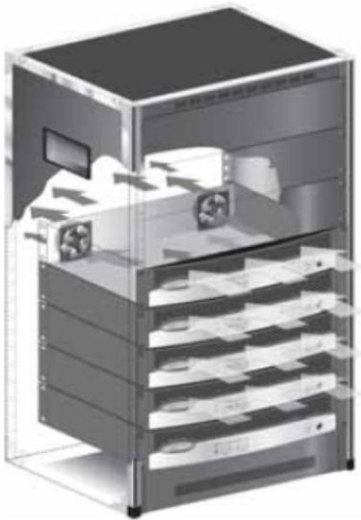


Figure 2.1 - Airflow

When operating the 8101 in a dusty environment, use commercial furnace filters, or equivalent, to prevent rapid clogging of the filters on the amplifier.

2.4 Choose Input Wire and Connectors

Figure 2.2 shows connector pin assignments for balanced wiring, and **Figure 2.3** shows connector pin assignments for unbalanced wiring. NOTE: Custom wiring should only be performed by qualified personnel.

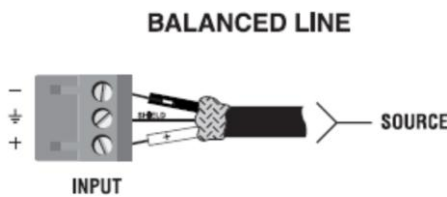


Figure 2.2 - Balanced Input Connector Wiring

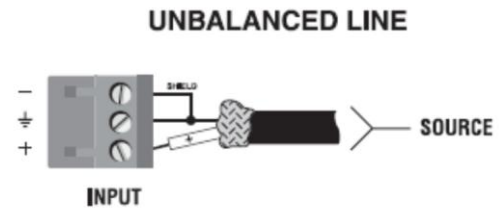


Figure 2.3 - Unbalanced Input Connector Wiring

2.5 Choose Output Wire and Connectors

A protective cover is installed over the barrier-strip output. Some models have a cover with two holes. To remove this type of cover:

1. Loosen screws inside top and bottom holes of cover (see **Figure 2.4**).
2. Slide cover to left or right, and then pull it off away from the amplifier.

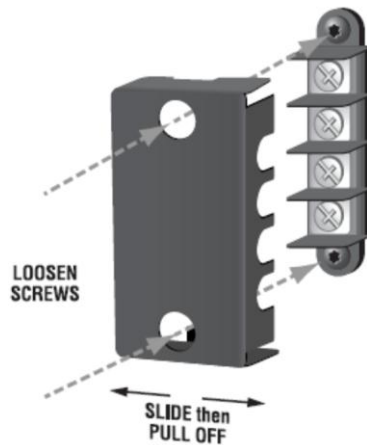


Figure 2.4 - Removing Barrier-strip Cover

AE TECHRON recommends using professionally constructed, high-quality, two- or four-conductor, heavy gauge wire and connectors. You may use terminal forks up to 10 AWG or bare wire for your output connectors (see **Figure 2.5**). To prevent the possibility of short-circuits, wrap or otherwise insulate exposed cable connectors. For best results, **AE TECHRON** recommends Panduit part #PV10-10LF-L or equivalent terminal fork. Screw spacing is also shown in Figure 2.5.

Using the guidelines below, select the appropriate size of wire based on the distance from amplifier to load (low-impedance loads only).

Distance	Wire Size
up to 25 ft. (7.6m)	16 AWG
26-40 ft. (7.9-12.2m)	14 AWG
41-60 ft. (12.5-18.3m)	12 AWG
> 60 ft. (18.3m)	10 AWG

2.6 Wiring Your System

2.6.1 Dual Configuration (2-8 ohm)

Before connecting the amplifier, make sure the AC power cord is unplugged.

Typical input and output wiring, along with Attenuator and Mode Switch settings are shown in **Figure 2.6**. Make sure the Mode switch is set to the DUAL position when operating in Dual mode.

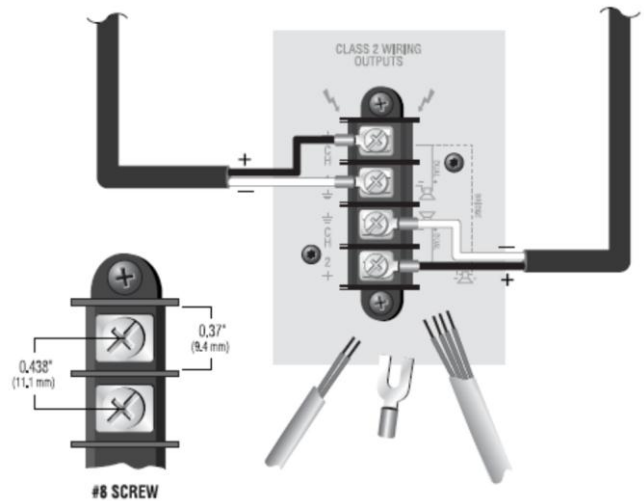




Figure 2.5 - Typical Output Connector Wiring



CAUTION

Never use shielded cable for output wiring.



WARNING

ELECTRIC SHOCK HAZARD. Output potentials can be lethal. Make connection only with AC Power OFF and input signals removed.

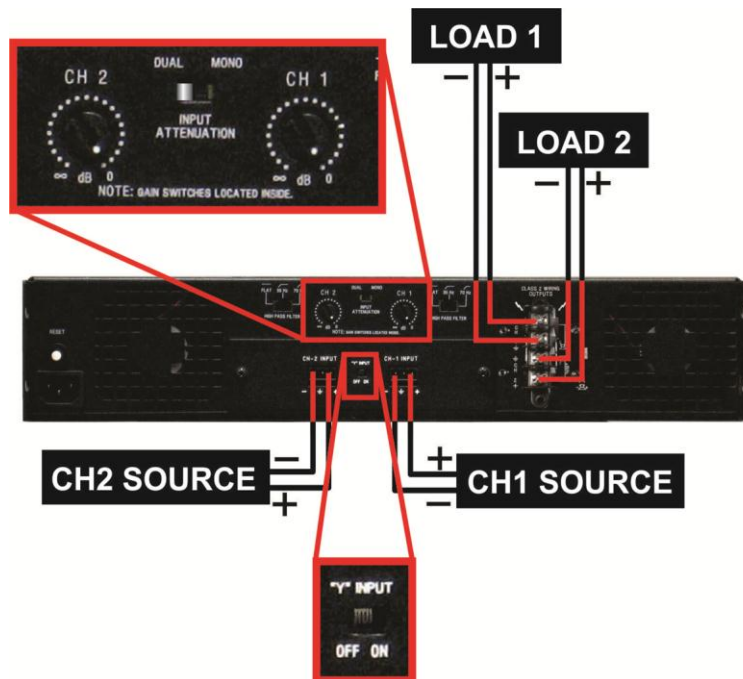


Figure 2.6 - System Wiring, Dual Configuration

Information subject to change

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INPUTS: Connect input wiring for each channel. The Y switch on inputs panel can be used to parallel the channel inputs when only mono input signals are necessary. The amplifier's channel outputs are still independent.

OUTPUTS: Maintain proper polarity (+/-) on output connectors. Connect the LOAD1's positive (+) lead to amplifier Channel 1 positive terminal; repeat for negative (-). Repeat Channel 2 wiring as for Channel 1. Refer to Section 2.5 for output connector pin assignments.

NOTE: Always route the input and output wires in separate bundles.

2.6.2 Bridge-Mono Configuration (4-16 ohm)

Typical input and output wiring, along with Attenuator and Mode Switch settings, are shown in **Figure 2.7**. Make sure the Mode switch is set to the MONO position when operating in Bridge-Mono mode.

INPUTS: Connect input wiring to Channel 1 only.

OUTPUTS: Connect the LOAD across the positive terminals of each channel pair. Do not use the negative terminals of the channel pair when the pair is being operated in Bridge-Mono mode. Refer to Section 2.5 for output connector pin assignments.

NOTE: When operating in Bridge-Mono mode, turn down (full counter clock-wise) the Input Attenuator for Channel 2. The Channel-1 Input Attenuator works both channels.

NOTE: Always route the input and output wires in separate bundles.

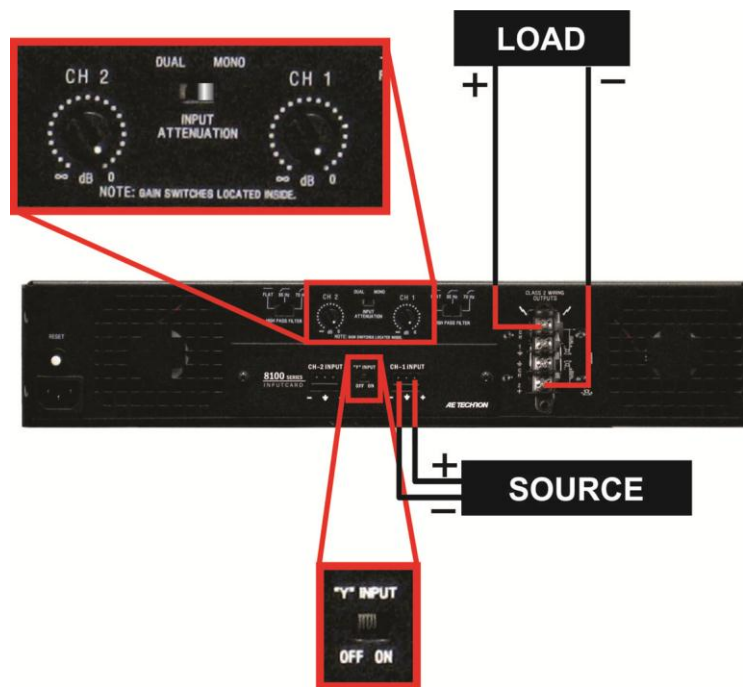


Figure 2.7 – System Wiring, Bridge-Mono Configuration

2.6.3 Dual Configuration with “Y” Input

This configuration feeds a mono signal to both Channel 1 and Channel 2.

INPUTS: Connect the signal to the Channel 1 input. On the back panel, set the “Y” Input Switch to ON.

OUTPUTS: Connect the Channel 1 LOAD’s positive (+) lead to Channel 1 positive terminal of amp; repeat for negative (-). Connect the Channel 2 LOAD’s positive (+) lead to Channel 2 positive terminal of amp; repeat for negative (-).

See **Figure 2.8**. Turn up both Input Attenuators and set the Mode Switch to DUAL.

NOTE: When the “Y” Input Switch is on, the Channel 2 input can be used to daisy-chain to another amplifier.

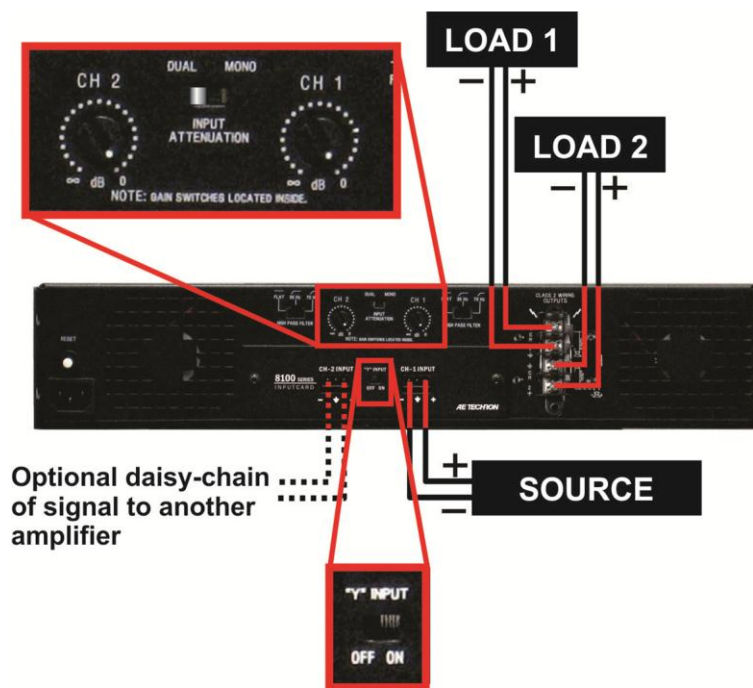


Figure 2.8 – System Wiring, Dual Configuration with “Y” Input

NOTE: Always route the input and output wires in separate bundles.

2.7 Connecting the AC Supply

On the back panel, check whether your amplifier is labeled for 120V or 220-240V AC mains. Connect your amplifier to the corresponding AC mains power source (power outlet) with the supplied AC power cord set.

WARNING

The third prong of this connector (ground) is an important safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.

First connect the IEC end of the cord set to the IEC connector on the amplifier. Then, with the amplifier in the OFF position, plug the other end of the cord set into the AC mains.

Amplifiers don’t create energy. The AC mains voltage and current must be sufficient to deliver the power you expect. Check the amplifier’s back-panel label, which specifies the

required AC mains voltage and frequency. The AC mains voltage must be no more than 15% above the

required voltage, and no less than 25% below the required voltage. The AC mains frequency must be within the required frequency range. If you are unsure of the output voltage of your AC mains, please consult your electrician.

2.8 Start-up Procedure

Use the following procedure when first turning on your amplifier:

1. Turn down the level of your signal source.
2. Turn down the level controls of the amplifier.
3. Depress the POWER switch to turn the amplifier ON. The Power indicator should glow. Wait for the READY LED to illuminate.
4. Turn up the level of your signal source to an optimum level.
5. Turn up the level controls on the amplifier until the desired voltage or power level is achieved. Verify that the Signal LED is flashing.
6. Adjust the input signal level to achieve the desired output level.

If you ever need to make any wiring or installation changes, don't forget to turn off the amplifier and disconnect the power cord.

3 Amplifier Operation

3.1 Precautions

Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifier first must be configured for proper operation, including input and output wiring. Improper wiring can result in serious operating difficulties. For information on wiring and configuration, please consult the **Setup** section of this manual.
2. Use care when making connections, selecting signal sources and controlling the output level.
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.
4. **Never connect the output to a power supply, battery or power main. Electrical shock may result.**
5. Tampering with the circuitry or making unauthorized circuit changes may be hazardous and invalidates all warranties.
6. Do not operate the amplifier with the red Clip LEDs constantly flashing.
7. Do not operate the amplifier with less than the rated load impedance. Due to the amplifier's output protection, such a configuration may result in premature clipping.

3.2 Front-Panel Controls and Indicators

This section provides an overview of Front-Panel controls and indicators found on the 8101 amplifier. Refer to **Figure 3.1** for item locations.

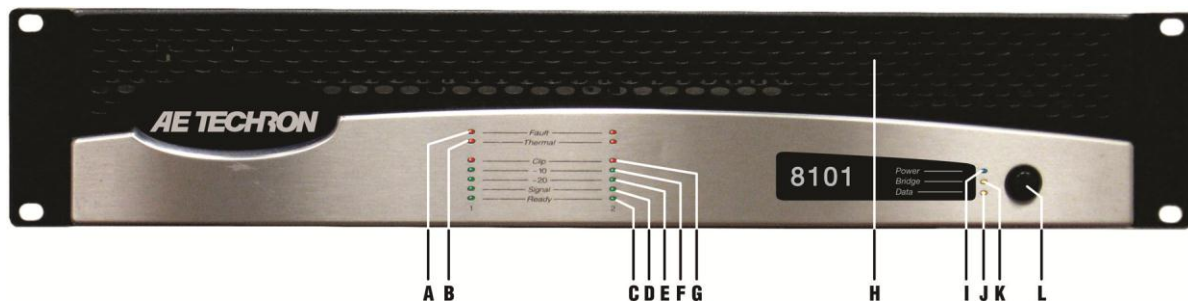


Figure 3.1 – 8101 Front-Panel Controls and Indicators

- A. Fault Indicator:** Red LED, one per channel, flashes when the amplifier output channel has stopped operating. Usually this means that the amplifier must be serviced.
- B. Thermal Indicator:** Red LED, one per channel, illuminates when the channel has shut down, or is very near shutting down, due to thermal stress or overload.
- C. Ready Indicator:** Green LED, one per channel, illuminates when the channel is initialized and ready to produce output.
- D. Input Signal Indicator:** Green LED, one per channel, illuminates when the channel's input signal is above -40 dBu.
- E. Output Signal Indicator, -20 dB:** Green LED, one per channel, illuminates when the channel's output signal is within 20 dB of clipping.
- F. Output Signal Indicator, -10 dB:** Green LED, one per channel, illuminates when the channel's output signal is within 10 dB of clipping.
- G. Clip Indicator:** Red LED, one per channel, illuminates when the channel's output signal reaches the onset of clipping. The Clip Indicator also will illuminate during Thermal Level Control (TLC) limiting or when the input compressor/limiter is protecting the amplifier from input overload.

- H. **Cooling Vents:** Front-to-rear forced airflow.
- I. **Power Indicator:** Blue LED indicates AC power has been applied and is within the safe operating range of the power supply. The LED will flash when the AC line voltage is approximately 15% above or 25% below the nominal rated value.
- J. **Data Indicator:** Feature not implemented
- K. **Bridge Mode Indicator:** Yellow LED illuminates when the rear panel Mode Switch is set to the “Bridge” Position
- L. **Power Switch:** Push-on / push-off switch.

3.3 Back-Panel Controls and Connectors

This section provides an overview of Back-Panel controls and connectors found on the 8101 amplifier. Refer to **Figure 3.2** for item locations.

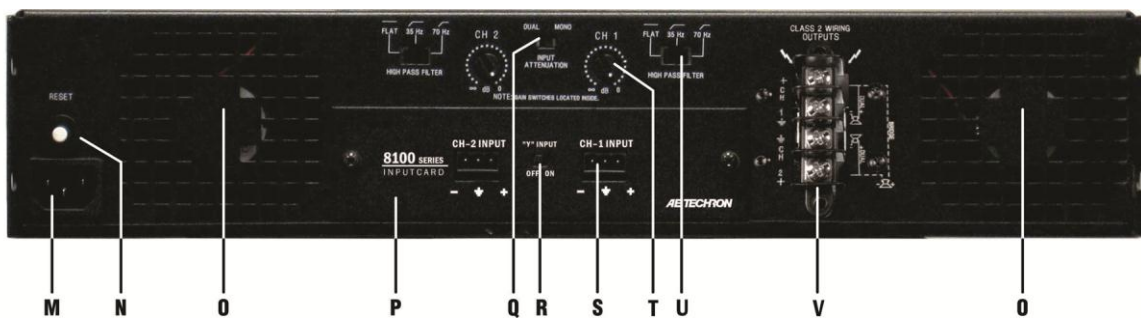


Figure 3.2 – 8101 Back-Panel Controls and Connectors

- M. **Power Cord Connector:** Standard 15 amp IEC inlet. A circuit breaker located near the IEC power inlet protects the amplifier from excessive AC current draw.
 - N. **Reset Switch:** Resets the circuit breaker that protects the power supply.
 - O. **Ventilation Grille:** Air flow is front to back. Do not block the ventilation grilles.
 - P. **Input Panel:** 8100 Series Input Card includes two balanced 3-pin removable barrier connectors. The “Y” Input Switch is described under letter R. Behind the input panel are the **Input Sensitivity Switches** (not shown). One 3-position switch per channel selects various sensitivity settings.
 - Q. **Mode Switch:** This two-position switch is used to select the amplifier’s mode of operation: Dual or Bridge Mono. Dual mode is used for 2-8 ohm loads. Bridge mode is used for 4-16 ohm loads.
 - R. **“Y” Input Switch:** When set to ON, this switch parallels the input signals of the two channels, for use when the input signal is mono. The amplifier’s channel outputs are still independent. The “Y” Input Switch also can be used to daisy-chain the signal to another amplifier. When this switch is set to ON, CH-1 input and CH-2 input are paralleled, reducing input impedance by 50%. Either CH-1 input or CH-2 input can be used when the “Y” Input switch is set to ON.
 - S. **Input Connectors:** Balanced 3-pin terminal block connectors, one per channel.
 - T. **Channel Level Controls:** One 21-position detented rotary attenuator per channel, ranging from –100 dB to 0 dB gain.
 - U. **High-Pass Filter:** One 3-position switch per channel selects between OFF, 35 Hz and 70 Hz 3-rd order filters.
 - V. **Output Connectors:** One four-pole touch-proof terminal strip. Accepts up to 10 AWG terminal forks.
- Output Cover (not shown):** This covers the output connectors, protecting users from the connectors’ potentially high voltage. This cover is required for Class 2 wiring installations.

4 Advanced Features and Options

This section describes protections and diagnostic features of the 8101 amplifier.

4.1 Protection Systems

You AE Techron amplifier provides extensive protection and diagnostic capabilities, including fault indicators, DC protect, AC under-/over-voltage protection, inrush limiting, and variable speed fans.

4.1.1 Fault

The amplifier will light the Fault LED if the amplifier output stage stops operating. If this happens, contact AE TECHRON for servicing information.

4.1.2 Low-Pass Filters

Gaussian-approximation ultrasonic filters prevent ultrasonic feedback and HF burnout of transducers. This type of filter preserves transient response better than a Butterworth filter.

4.1.3 AC Under/Over Voltage Protection

If the AC line voltage drops below 25% or rises above 15% of the nominal operating voltage of the amplifier, the amplifier's power supply turns off and the blue Power LED flashes. The amplifier will turn back on when the AC line voltage returns to safe operating levels (within +15% / -25%).

4.1.4 Circuit Breaker

A circuit breaker located near the IEC power inlet protects the amplifier from excessive AC current draw.

4.1.5 Inrush Limiting

A soft-start circuit in the power supply minimizes the amplifier's current draw during power-on.

4.1.6 Variable-Speed Fans

Two continuously variable speed fans direct the airflow through the amplifier for cooling.

4.2 Advanced Features

4.2.1 Switching Power Supply

The switching Power Supply minimizes the amplifier's weight.

Typical non-switching power supplies require large, heavy transformers in order to produce the required power at the output stage. These transformers must be large to operate at 50 to 60 Hz (standard AC supplied by the power company).

By contrast, switching power supplies can operate with a much smaller (and lighter) transformer because they first convert the AC up to a much higher frequency, thereby reducing waste. The power supply is voltage-specific, allowing use in regions using 120V or 240V.

4.2.2 Sleep Circuit

Lowers standby power consumption by shutting down the high-voltage supplies during idle periods.

4.2.3 Input Sensitivity Switches

To access the Input Sensitivity Switches, turn off the amplifier and remove the Input Panel. The switches are in the top surface of the cavity behind the Input Panel (see **Figure 4.1**). One 3-position switch per channel selects among these settings:

- 1.4 V (Gain of 63.9)
- 26 dB gain (Gain of 20)
- 1.4 V (not normally used).

The Specifications chapter lists the input sensitivity for the 26 dB gain setting.

4.2.4 Nominal Attenuation Settings

The signal level for each input can be attenuated accurately by adjusting the 21-step Level Control (see Section 3.3). **Figure 4.2** shows the attenuation in dB for each detent. The setting of the input-sensitivity switch varies the actual attenuation as shown. The accuracy of the attenuation varies with the setting: see Tolerance (dB).



Figure 4.1 – Input Sensitivity Switches Location

Detent	26 dB	Tolerance (dB)	4/8 ohm or 70/100V
0 (full CW)	0.0	±1	0.0
1	0.5	±1	0.5
2	1.0	±1	1.5
3	2.0	±1	3.5
4	3.0	±1	5.0
5	4.0	±1	6.5
6	5.0	±1	8.0
7	6.0	±1	9.5
8	7.0	±1.5	11.0
9	8.0	±1.5	13.0
10	9.0	±1.5	14.5
11	10.5	±1.5	16.0
12	12.0	±1.5	18.0
13	13.5	±3	20.0
14	15.0	±3	22.0
15	18.0	±3	24.0
16	21.0	±3	26.0
17	24.0	±3	30.0
18	36.0	±6	42.0
19	48.0	±6	54.0
20 (full CCW)	OFF	OFF	OFF

Figure 4.2 – Attenuation vs. Detent of Level Controls

5 Maintenance

Simple maintenance can be performed by the user to help keep the equipment operational. The following routine maintenance is designed to prevent problems before they occur. See **Section 6, Troubleshooting**, for recommendations for restoring the equipment to operation after an error condition has occurred.

Preventative maintenance is recommended after the first 250 hours of operation, and every three months or 250 hours thereafter. If the equipment environment is dirty or dusty, preventative maintenance should be performed more frequently.

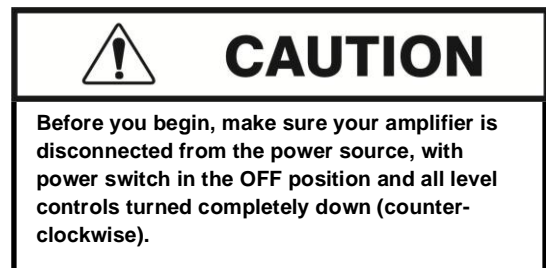
5.1.1 Clean Amplifier Grills and Internal Heat Sinks

Tools Required – The recommended equipment and supplies needed to perform the functions required for this task are described below.

- Compressed air blower
- Damp cloth (use water only or a mild soap diluted in water)


To ensure adequate cooling and maximum efficiency of the internal cooling fans, the amplifier's front and rear grills should be cleaned periodically, and compressed air should be flushed from front to back through the amplifier. To clean the amplifier grills and internal heat sinks, complete the following steps:

1. Turn completely down (counter-clockwise) all level controls and turn the amplifier OFF. Disconnect the amplifier from its power source.
2. Using a compressed air blower, force air through the front ventilation grill and the internal heat sinks, and toward the back ventilation grills.
3. Using a damp cloth, clean the front and rear ventilation grills. Dry with a clean cloth or allow to air dry. **IMPORTANT: Grills should be completely dry before plugging in or restarting amplifier.**





6 Troubleshooting


This section describes conditions, and possible reasons for common situations encountered during the use of 8101 amplifier.


<p>Fault ———●</p> <p>Thermal ———●</p> <p>Clip ———●</p> <p>-10 ———●</p> <p>-20 ———●</p> <p>Signal ———●</p> <p>Ready ———●</p>	<p>Power ●</p> <p>Bridge ●</p> <p>Data ●</p>		<p>CONDITION: Power indicator is off.</p> <p>POSSIBLE REASON:</p> <p>The amplifier has lost AC power.</p> <p>The amplifier's Power switch is off.</p> <p>The amplifier is not plugged into the power receptacle.</p> <p>The amplifier output level is so high that the power supply circuit breaker has tripped. Allow unit to cool. Press the Reset Switch on the back panel.</p>
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Key	● Off
	◐ Flashing
	○ Any condition (off, flashing or lit)
	☀ Lit


<p>Fault ———●</p> <p>Thermal ———●</p> <p>Clip ———●</p> <p>-10 ———●</p> <p>-20 ———●</p> <p>Signal ———●</p> <p>Ready ———●</p>	<p>Power ◐</p> <p>Bridge ●</p> <p>Data ●</p>		<p>CONDITION: Power indicator is flashing.</p> <p>POSSIBLE REASON:</p> <p>The AC line voltage has dropped below 20% or has risen above 15% of the nominal line voltage of the power supply.</p>
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<p>Fault ———●</p> <p>Thermal ☀</p> <p>Clip ———●</p> <p>-10 ———●</p> <p>-20 ———●</p> <p>Signal ———●</p> <p>Ready ———●</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: Thermal indicator is flashing.</p> <p>POSSIBLE REASON:</p> <p>The amplifier is becoming too hot for safe operation. Allow amplifier to cool. Check for loads less than 2 ohms, and for excessive input levels. Check for proper ventilation and proper mode-switch setting.</p>
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<p>Fault ☀</p> <p>Thermal ———●</p> <p>Clip ———●</p> <p>-10 ———●</p> <p>-20 ———●</p> <p>Signal ———●</p> <p>Ready ———●</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: Fault indicator is on.</p> <p>POSSIBLE REASON:</p> <p>The amplifier channel has stopped operating. Return the unit to AE Techron for servicing.</p>
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<p>Fault ————— ●</p> <p>Thermal ————— ●</p> <p>Clip ————— ☀</p> <p>-10 ————— ☀</p> <p>-20 ————— ☀</p> <p>Signal ————— ☀</p> <p>Ready ————— ☀</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: Distorted signal.</p> <p>POSSIBLE REASON:</p> <p>Load is wired incorrectly or Mode switch is set incorrectly. Check both.</p> <p>Input is overloaded by a signal level that is too high. Turn down the input signal until the clip light goes out.</p>
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<p>Fault ————— ●</p> <p>Thermal ————— ●</p> <p>Clip ————— ●</p> <p>-10 ————— ●</p> <p>-20 ————— ●</p> <p>Signal ————— ●</p> <p>Ready ————— ☀</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: No input signal.</p> <p>Signal indicator is not flashing even though input signal is applied and the channel is ready.</p> <p>POSSIBLE REASON:</p> <p>Input signal level is very low</p> <p>Level controls are turned down.</p>
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<p>Fault ————— ●</p> <p>Thermal ————— ●</p> <p>Clip ————— ●</p> <p>-10 ————— ●</p> <p>-20 ————— ●</p> <p>Signal ————— ☀</p> <p>Ready ————— ☀</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: No output signal, even though the amp has power.</p> <p>Power LED is on without flashing and the amp is receiving an input signal. Input Signal indicator on without flashing.</p> <p>POSSIBLE REASON:</p> <p>Load is not connected.</p> <p>Open circuit due to load failure.</p>

<p>Fault ————— ●</p> <p>Thermal ————— ●</p> <p>Clip ————— ☀</p> <p>-10 ————— ●</p> <p>-20 ————— ●</p> <p>Signal ————— ●</p> <p>Ready ————— ☀</p>	<p>Power ☀</p> <p>Bridge ○</p> <p>Data ○</p>		<p>CONDITION: No output signal, even though the amp has power.</p> <p>Power LED is on without flashing and the amp is receiving an input signal. Input Signal indicator, Output Signal indicators and Clip indicator are flashing.</p> <p>POSSIBLE REASON:</p> <p>One of the amplifier outputs is shorted: Disconnect your load from the affected channel(s) one by one to determine if one of the loads is shorted.</p>

6.1 Factory Service

If the troubleshooting procedures are unsuccessful, the amplifier may need to be returned for Factory Service. All units under warranty will be serviced free of charge (customer is responsible for one-way shipping charges as well as any custom fees, duties, and/or taxes). Please review the Warranty at the beginning of this manual for more information.



All service units must be given Return Authorization by AE Techron, Inc. before being returned. Return Authorizations can be requested on our website or by contacting our Customer Service Department.

Please take extra care when packaging your amplifier for repair. It should be returned in its original packaging or a suitable alternative. Replacement packaging materials can be purchased for a nominal fee.

Please send all service units to the following address and be sure to include your Return Authorization Number on the box.

**AE Techron, Inc.
Attn: Service Department / RMA#
2507 Warren Street
Elkhart, IN 46516**

7 Specifications

Specifications are for units in Dual mode driving both channels into 8-ohm loads, (26 dB = 20 times voltage gain) and operating from 120 VAC, unless otherwise specified.

"Standard 1 kHz Power" refers to maximum average power in watts at 1 kHz with 0.1% THD.

"Full Bandwidth Power" refers to maximum average power in watts from 20 Hz to 20 kHz with 0.1% THD.

7.1 Performance

Frequency Response:

± 0.25 dB from 20 Hz to 20 kHz at 1 watt.

Signal to Noise Ratio:

< 105 dB (ref. rated power, 20 Hz to 20 kHz, A-weighted).

Total Harmonic Distortion (THD):

< 0.35% at full rated power, from 20 Hz to 20 kHz.

I.M. Distortion:

< 0.35% at 60 Hz and 7 kHz at 4:1, from -40 dB to full rated power.

Crosstalk:

> 80 dB (below rated power) 20 Hz to 1 kHz.

DC Output Offset:

< 2 mV

Input Impedance (nominally balanced, nominally unbalanced):

10 k ohms, 5 k ohms.

Common Mode Rejection (CMR) (20Hz to 1kHz, typical):

50 dB

Maximum Input Voltage:

± 10 V balanced or unbalanced

Load Impedance:

Dual: 2, 4, 8, 16 Ohm

Bridge Mono: 4, 8, 16 Ohm

Gain Control (when enabled, switch selectable):

Voltage gain adjustable from 20 to 0 or from 63 to 0.

Required AC Mains (+15%, -25%):

120V/60Hz, 230V/50Hz.

Power Draw at Idle (120 VAC mains):

35W (Standby Mode).

Overall Group Delay:

< 120 usec

Operating Temperature:

10 °C to 50 °C (50 °F to 122 °F), maximum output power de-rated above 30 °C (86 °F).

Humidity:

70% or less, non-condensing.

Cooling:

Front-to-back airflow.

Chassis:

The amplifier is designed for stand-alone or rack-mounted operation. The chassis is aluminum with a black powder-coat finish. The unit occupies two EIA 19-inch-wide units.

Dimensions:

Width - 19 inches (48.3 cm)

Height - 3.5 inches (8.9 cm)

Depth - 14.25 inches (36.2 cm)

Net Weight:

27.0 lbs. (12.3 kgs.)

Shipping Weight:

32.0 lbs. (14.5 kgs.)

7.2 Output Power

The following are typical output at 1 kHz from units configured for 120 VAC, 60 Hz power.

Dual Channel Mode – Output per Channel, Both Channels Driven

Ohms	PEAK OUTPUT						RMS OUTPUT				
	40mSec Pulse, 20% Duty Cycle		5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Watts
open	167		167		167		118		118		
16.5	142	8.6	143	8.6	138	8	101	6.1	97.5	5.9	575
8	127	16	101	12.6	98	13	71.5	8.9	69.5	8.7	605
4	103	26	71	18	67	17	50	12.5	47.5	11.9	565
2	71	35	49	25	46	23	35	17.5	32.5	16.3	530
1	43	43	30	30	Not recommended		21.5	21.5	Not recommended		

Bridge-Mono Mode

Ohms	PEAK OUTPUT						RMS OUTPUT				
	40mSec Pulse, 20% Duty Cycle		5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		5 Minute, 100% Duty Cycle		1 Hour, 100% Duty Cycle		
	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Watts
open	335		335		335		235		235		
16	255	16	202	13	197	12	144	8.9	139	8.7	1209
8	206	26	141	18	134	17	100	12.5	95	11.9	1130
4	141	35	99	25	92	23	70	17.5	65	16.3	1059
2	86	44	59	30	Not recommended		42	21.0	Not recommended		

7.3 Performance Graphs

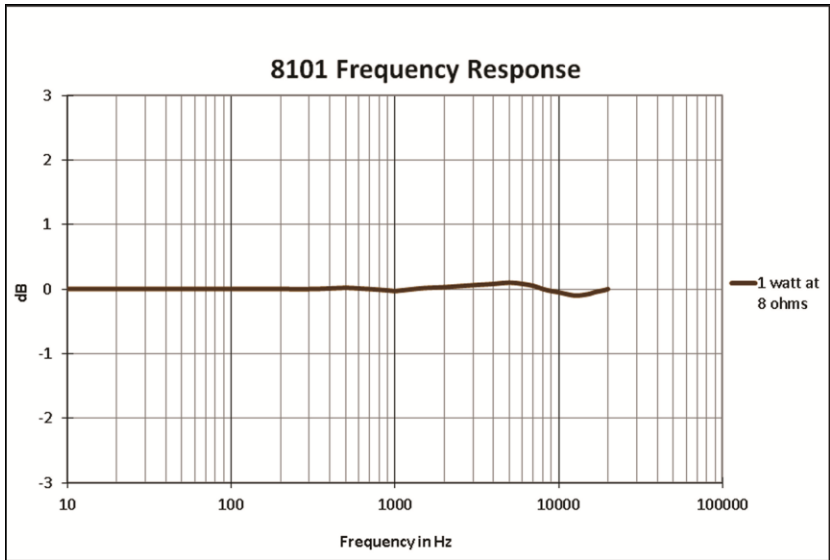


Figure 6.4 – Typical Frequency Response

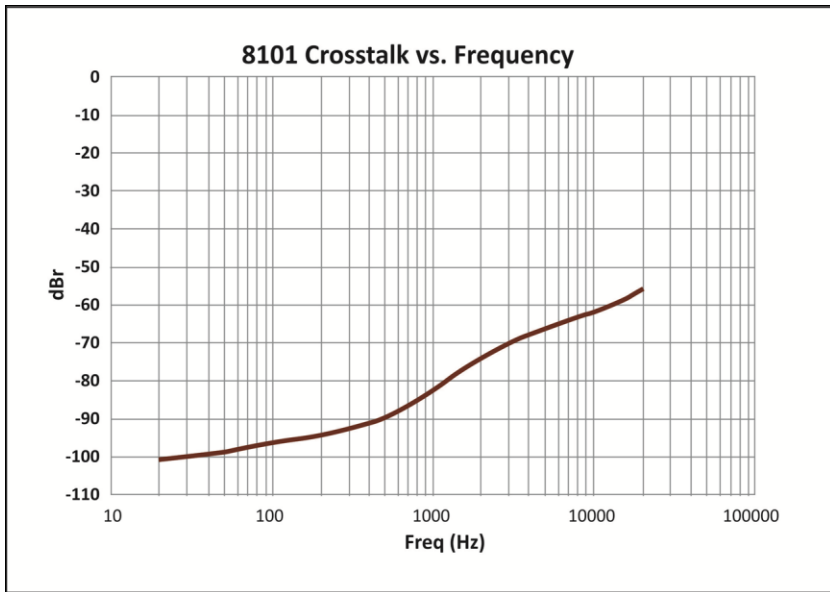


Figure 6.5 – Typical Crosstalk vs. Frequency

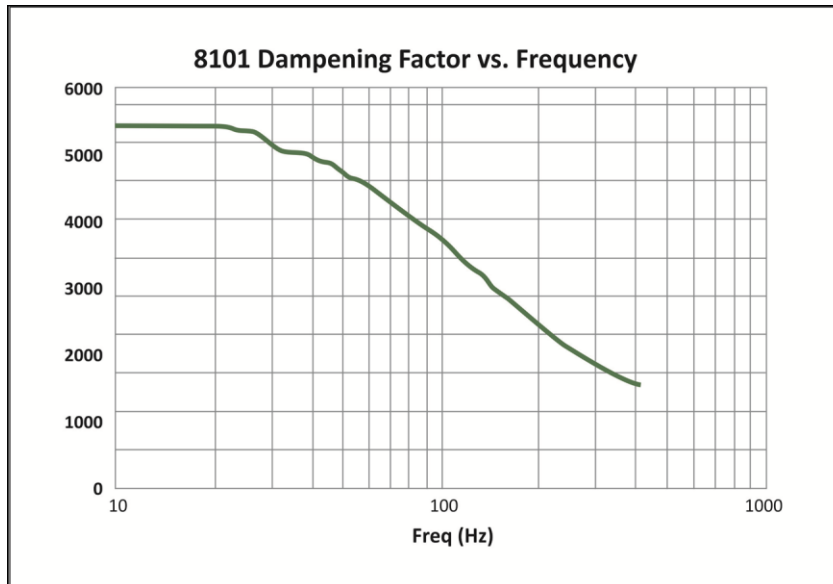


Figure 6.6 – Typical Dampening Factor vs. Frequency

7.4 Power Draw and Thermal Dissipation

Given:

- Pink noise 12dB crest factor, bandwidth limited 22 Hz to 22 kHz.
- Typical line impedance used.
- Measurements made with 120VAC mains. Data based on all channels driven.
- Line current figures for 230VAC units derived by multiplying 120VAC figures by 0.5.
- Line current figures for 100VAC units (not shown) are 1.2 times the line current figures of 120VAC units.
- Power draw ("watts in") of 100VAC units is the same as power draw of 120VAC units.

	Load	Rated Power	Line Current 120VAC	Line Current 230VAC	Watts			Thermal Dissipation	
					watts in	watts out	dissipated	Btu/hr	kcal/hr
At Idle (sleep mode)					40	0	40	137	34
1/8th Power Pink Noise Typical of program material just at clip.	8 Ohms/Ch. 16 Ohms Bridge	1000x2 2000	6.6	3.3	546	256	290	988	249
	4 Ohms/Ch. 8 Ohms Bridge	1000x2 2000	7.0	3.5	563	255	307	1049	264
	2 Ohms/Ch. 4 Ohms Bridge	1000x2 2000	7.2	3.6	602	251	351	1198	302
	70/100V/Ch. 140/200V Bridge	1000x2 2000	6.7	3.4	639	257	382	1304	329
1/3rd Power Pink Noise Typical of program material with severe clipping.	8 Ohms/Ch. 16 Ohms Bridge	1000x2 2000	11.3	5.6	980	676	304	1036	261
	4 Ohms/Ch. 8 Ohms Bridge	1000x2 2000	12.3	6.2	1064	672	392	1338	337
	2 Ohms/Ch. 4 Ohms Bridge	1000x2 2000	13.7	6.9	1190	705	485	1655	417
	70/100V/Ch. 140/200V Bridge	1000x2 2000	11.6	5.8	990	674	316	1080	272

Figure 6.7 – Power Draw and Thermal Dissipation