

HP 87421A Power Supply
HP 87422A Power Supply

Operating and Service
Manual



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Santa Rosa Systems Division
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Warranty

Certification

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology (NIST, formerly NBS), to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

Warranty

This Hewlett-Packard system product is warranted against defects in materials and workmanship for a period corresponding to the individual warranty periods of its component products. Instruments are warranted for a period of one year. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products that prove to be defective.

Warranty service for products installed by HP and certain other products designated by HP will be performed at Buyer's facility at no charge within HP service travel areas. Outside HP service travel areas, warranty service will be performed at Buyer's facility only upon HP's prior agreement and Buyer shall pay HP's round trip travel expenses. In all other areas, products must be returned to a service facility designated by HP.

For products returned to HP for warranty service, Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

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Assistance

Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.

For assistance, call your local Hewlett-Packard Sales and Service Office (refer to “Service and Support” on page v).

Service and Support

Any adjustment, maintenance, or repair of this product must be performed by qualified personnel. Contact your customer engineer through your local HP Service Center. You can find a list of HP Service Centers on the web at <http://www.hp.com/go/tmdir>.

If you do not have access to the Internet, one of these HP centers can direct you to your nearest HP representative:

United States:	Hewlett-Packard Company Test and Measurement Call Center PO Box 4026 Englewood, CO 80155-4026 (800) 452 4844 (toll-free in US)
Canada:	Hewlett-Packard Canada Ltd. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 (905) 206 4725
Europe:	Hewlett-Packard European Marketing Centre Postbox 999 1180 AZ Amstelveen The Netherlands (31 20) 547 9900
Japan:	Hewlett-Packard Ltd. Measurement Assistance Center 9-1, Takakura-Cho, Hachioji-Shi Tokyo 192, Japan (81) 426 56 7832 (81) 426 56 7840 (FAX)
Latin America:	Hewlett-Packard Latin American Region Headquarters 5200 Blue Lagoon Drive, 9th Floor Miami, Florida 33126, U.S.A. (305) 267 4245, (305) 267-4220 (305) 267 4288 (FAX)
Australia/New Zealand:	Hewlett-Packard Australia Ltd. 31-41 Joseph Street Blackburn, Victoria 3130 Australia 1 800 629 485 (Australia) 0800 738 378 (New Zealand) (61 3) 9210 5489 (FAX)
Asia-Pacific:	Hewlett-Packard Asia Pacific Ltd. 17-21/F Shell Tower, Times Square 1 Matheson Street, Causeway Bay Hong Kong (852) 2599 7777 (852) 2506 9285 (FAX)

Safety and Regulatory Information

Review this product and related documentation to familiarize yourself with safety markings and instructions before you operate the instrument. This product has been designed and tested in accordance with international standards.









WARNING

The **WARNING** notice denotes a hazard. It calls attention to a procedure, practice, or the like, that, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

CAUTION

The **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

Instrument Markings

	When you see this symbol on your instrument, you should refer to the instrument's instruction manual for important information.
	This symbol indicates hazardous voltages.
	The laser radiation symbol is marked on products that have a laser output.
	This symbol indicates that the instrument requires alternating current (ac) input.
	The CE mark is a registered trademark of the European Community. If it is accompanied by a year, it indicates the year the design was proven.
	The CSA mark is a registered trademark of the Canadian Standards Association.
1SM1-A	This text indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPER 11, Clause 4).
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is OFF or in STANDBY position.



Safety Earth Ground

This is a Safety Class I product (provided with a protective earthing terminal). An uninterruptible safety earth ground must be provided from the main power source to the product input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, the product must be made inoperative and secured against any unintended operation.

Before Applying Power

Verify that the product is configured to match the available main power source as described in the input power configuration instructions in this manual. If this product is to be powered by autotransformer, make sure the common terminal is connected to the neutral (grounded) side of the ac power supply.

Safety and Regulatory Information Manufacturer's Declaration

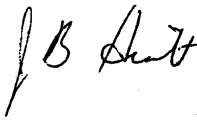
Note

Note

This is to certify that this product meets the requirements specified in IEC 1010 and IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus. It has been supplied in a safe condition for indoor use only and may occasionally be subjected to temperatures between +5 and -10 celsius without degradation of its safety. The present data sheet contains some information and warnings which have to be followed by the user to ensure safe operation and to retain the product in safe condition. The main plug shall be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor. **Warning:** Any interruption of the protective conductor inside or outside the product or disconnection of the protective earth terminal is likely to make the equipment dangerous. Intentional interruption is prohibited. This product has been designed to be safe under the following environmental conditions: indoor use; altitude up to 2000 meters; temperature range expanded to include 0 to +55 Celsius; maximum relative humidity 80% up to 31 degrees Celsius decreasing linearly to 50% relative humidity at 40 degrees Celsius; mains supply voltage fluctuations not to exceed $\pm 10\%$ of nominal voltage; transient over voltage category II for the main ac supply voltage; pollution degree two. If the equipment is used in a manner not specified by Hewlett-Packard, the protection provided by the equipment may be impaired.

Model HP 87422A

Declaration of Conformity

DECLARATION OF CONFORMITY <small>according to ISO/IEC Guide 22 and EN 45014</small>	
Manufacturer's Name:	Hewlett-Packard Co.
Manufacturer's Address:	Microwave Instruments Division 1400 Fountaingrove Parkway Santa Rosa, CA 95403-1799 USA
Declares that the products	
Product Name:	Amplifiers with power supplies.
Model Number:	HP 83006A, HP 83017A, HP 83018A, HP 83020A, HP 83050A, HP 83051A, HP 87421A and HP 87422A
Product Options:	This declaration covers all options of the above products.
Conform to the following product specifications:	
Safety: IEC 1010-1:1990+A1 / EN 61010-1:1993 CAN/CSA-C22.2 No. 1010.1-92	
EMC: CISPR 11:1990/EN 55011:1991 Group 1, Class A IEC 801-2:1984/EN 50082-1:1992 4 kV CD, 8 kV AD IEC 801-3:1984/EN 50082-1:1992 3 V/m, 27-500 MHz IEC 801-4:1988/EN 50082-1:1992 0.5 kV Sig. Lines, 1 kV Power Lines	
Supplementary Information:	
The products herewith comply with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carry the CE-marking accordingly.	
The amplifiers conformed to the listed specifications when they were tested with HP 87421A and HP 87422A power supplies.	
	
Santa Rosa, California, USA 31 Oct. 1997	John Hiatt/Quality Engineering Manager
European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Strasse 130, D-71034 Böblingen, Germany (FAX +49-7031-14-3143)	

Declaration of Conformity

HP 87421A/HP 87422A Power Supply

HP 87422A Power Supply

The HP 87422A is a 90 watt, ± 15 V power supply designed to power the HP 83020A microwave system power amplifier. One additional ± 12 V dc output is provided to power a preamplifier such as the HP 83006A or HP 83017A.

The power supply includes an AC power cord with protective ground for connection to 90-240 Vac and two 2 meter cables:

- one cable (HP 83006-60005) with a 3-pin connector on one end and a D-subminiature connector on the other end
- one cable (HP 87422-60001) for direct connection to the HP 83020A amplifier

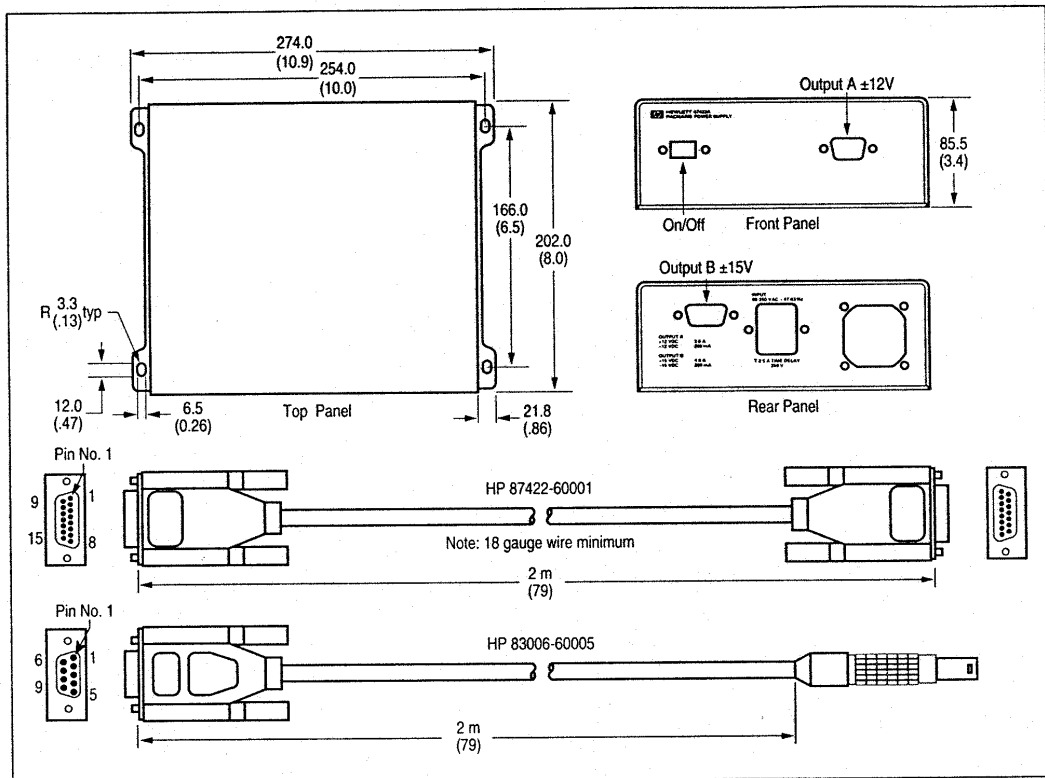


Figure 2 HP 87422A Power Supply Diagram

Specifications

Table 1 Specifications

Product Specifications		
Model Number	HP 87421A	HP 87422A
Output voltage/current	+12 V at 2 A –12 V at 200 mA	+15 V at 4.0 A –15V at 20 mA +12V at 2 A –12V at 200mA
Output power	25 W	90 W
Line regulation	0.1%	0.1%
Load regulation (20% to full load)	2.0%	1.0%
Output ripple	25 mV RMS max	25 mV RMS max
Output noise	2% peak to peak max	2% peak to peak max
Overvoltage limit protected	Yes	Yes
Short circuit protection	Current limited for overload and short circuit protection. Normal operation returns upon removal of overload.	Current limited for overload and short circuit protection. Normal operation returns upon removal of overload.
General Specifications		
AC input voltage	90-250 Vac, 50/60 Hz	90-240 Vac, 50/60 Hz
Fuse	1 A, slow blow	T 3.15 A
Weight	0.9 kg (2.0 lb)	2.1 kg (4.6 lb)
Shipping Weight	1.8 kg (4.0 lb)	3.2 kg (7.0 lb)
Environment Specifications		
Operating temperature	0 to +55 °C full load	0 to +55 °C full load
Storage temperature	–40 to +70 °C	–40 ° C to +70 °C
Product Safety		
	CAN/CSA 234 IEC 1010 UL 1950	CAN/CSA 234 IEC 1010 UL 1950

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Operating and Service

Operating Instructions

To operate the power supplies, connect the power supplies output to the amplifier dc input with the cable provided. The power supplies include a power cord with protective ground for connection to 90-240 Vac.

Mounting holes are provided as shown in the diagrams. The power supplies may be mounted in any orientation with user supplied hardware.

NOTE

- To ensure continued compliance to product safety and EMC specifications, connect the power supplies to an amplifier only with the cable provided.
- Do not attempt to modify or extend the dc output cable. Contact your local Hewlett-Packard Sales and Service office for help with special applications requiring longer cables.

Fuse Replacement

The power supplies have a fuse located next to the IEC appliance inlet. If it is necessary to replace the fuse, disconnect the power supply from both AC power and the amplifier. Using a slotted screw driver, open the fuse cover and replace the fuse.

Service Information

The power supplies contain no user serviceable parts (with the exception of the fuse). If service is required, contact your nearest Hewlett-Packard Service Center. Refer to “Service and Support” on page v.

Available Instruments and Accessories

- HP 83006A microwave system amplifier 0.01-26.5 GHz
- HP 83017A microwave system amplifier 0.5-26.5 GHz
- HP 83018A microwave system amplifier 2-26.5 GHz
- HP 83020A microwave system power amplifier 2-26.5 GHz
- HP 87415A microwave system amplifier 2-8 GHz
- HP 83440C high speed lightwave converter dc-20 GHz, 1000-1600 nm
- HP 83440-60009 lightwave converter power supply adapter