med associates inc

instrumentation and software for research

AVERSIVE STIMULATOR

ENV-406M, ENV-410B, ENV-412

PRODUCT MANUAL

DOC-075
Rev. 1.3

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notes

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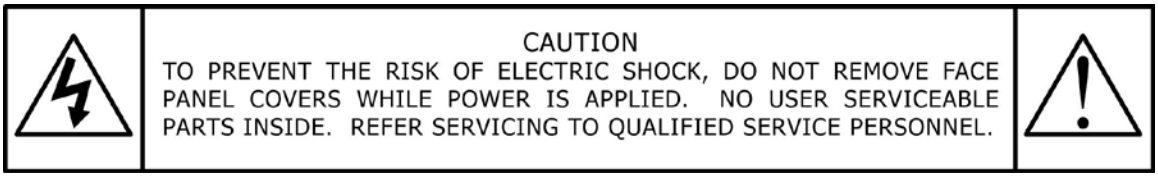

CHAPTER 1 | INTRODUCTION

For safety reasons, it is strongly recommended that these safety instructions be read completely prior to operating the aversive stimulator and power supply. It is also important to keep this manual for future use.

Carefully observe all warnings, precautions and operating instructions provided by MED Associates, Inc. when operating the aversive stimulator and accompanying power supply.

Modular aversive stimulus components are designed for animal studies only. Use with MED Associates cabinets for maximum flexibility and economy. The power supplies built into new interface and modular cabinets support four aversive stimulus units and accessories with space limited to a total of 9 single width panels in tabletop cabinets, and 18 single width panels in rack mount chassis.

ENV-406M Modular Grid Harness

This harness consists of a quick disconnect circuit board, which attaches to any ENV-007 or ENV-008 modular test chamber, and a 20” cable with DB-9 connectors on each end.

ENV-410 Manual Aversive Stimulation Source

CAUTION
320 VAC RMS AND 10 mA AT
CONNECTOR CONTACTS WHEN POWER IS APPLIED.

This is a lower voltage aversive stimulus module (230V peak) designed to provide constant current stimulation with continuous regulation to prevent the possibility of tissue damage seen in some older designs. Outputs are adjustable in two ranges, 0-1 milliamps and 0-10 milliamps, using a ten-turn potentiometer with a digital and vernier scales that produce a resolution of 0.01 or 0.001 milliamps. Other features include a dummy or test load switch, LED indicator, front panel operate switch, non-precision meter, and optically isolated activation from a front panel switch, remote control closure, or interface output card.

Figure 1.1 – ENV-410B Face Panel

Table 1.1 – ENV-410B Specifications

Electrical Requirements	+/- 15 VDC
Current Set Range	0 to 10 mA RMS
Maximum Current	10 mA at 30 kΩ
Maximum Voltage Output	320 VAC RMS
Regulation	+/- 20% - 10K to 30 KΩ at full output
Remote Operation	28 VDC
Control Switching	Opto-Isolator

ENV-412 Solid State Grid Floor Scrambler

	CAUTION 320 VAC RMS AND 10 mA AT DB-9 CONNECTOR WHEN CONNECTED TO ENV-410B AND POWER IS APPLIED.	

Nine unique outputs are provided at the convenient DB-9 connector. Each is a direct semiconductor switch so that the current level remains the same regardless of the number of grids contacted or even if contact is broken.

Figure 1.2 – ENV-412 Front Panel

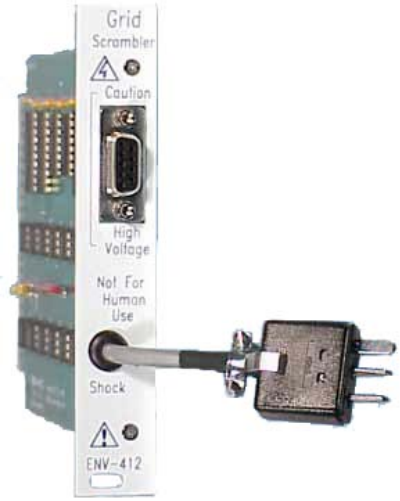

Table 1.2 – ENV-412 Specifications

Electrical Requirements	+/- 15 VDC
Maximum Current	10 mA at 30 kΩ
Maximum Voltage Output	320 VAC RMS
Control Switching	Opto-Isolator

CHAPTER 2 | IMPORTANT SAFETY PRECAUTIONS

Water and Moisture - Do not install the aversive stimulator and power supply near water: for example near a bathtub, washbowl, laboratory sink, or in a wet basement, etc.

Heat - Do not install the aversive stimulator and power supply near sources of heat such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

Ventilation - Slots and openings in the cabinet and in the back and bottom are provided for necessary ventilation. To ensure reliable and safe operation of the aversive stimulator and power supply, and to protect it from overheating, these slots and openings must never be blocked or covered. Do not install the aversive stimulator and power supply in a confined space, such as a bookcase or built-in cabinet, unless proper ventilation is provided.

Carts and Stands - Do not install the aversive stimulator and power supply on an unstable table, shelf, cart or stand. Use only a cart or stand recommended by MED Associates, Inc. An aversive stimulator and power supply and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause them to overturn.

Proper Use

Power Source - Connect the unit to an aversive stimulator and power supply only of the type described in the operating instructions or as marked on the unit.

Grounding or Polarization - Do not defeat the grounding or polarization feature of the AC power cord. If the AC receptacle will not accept the power cord plug, contact an electrician to install a proper AC receptacle.

AC Receptacle - Verify that the AC receptacle holds the power cord plug firmly and securely. If the power cord plug is loose, contact an electrician to replace the defective and unsafe AC receptacle.

Power Cord Protection - Route the power cord so that it is not likely to be walked on or pinched by having objects placed on it, paying particular attention to the plugs, receptacles, and point where the cord exits from the device.

When not in use - Unplug the power cord of the aversive stimulator and power supply from the outlet when left unused for a long period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the plug out by the cord.

Foreign Objects - Be careful that foreign objects and liquids do not enter the enclosure through openings.

Damage Requiring Service

Unplug the aversive stimulator and power supply from the wall outlet and consult qualified service personnel if any of the following occur:

- Power supply cords or plugs are damaged.
- A foreign object or liquid is inside the cabinet.
- The aversive stimulator or power supply has been exposed to rain or moisture.
- The device does not appear to be operating normally or is exhibiting a marked change in performance.
- The aversive stimulator and power supply has been dropped or the enclosure damaged.

Servicing

Do not attempt to service the aversive stimulator and power supply beyond what is described in the operating instructions. For all other servicing, refer to qualified service personnel only.

Cleaning

The aversive stimulator and power supply should be cleaned only with a polishing cloth or a soft dry cloth. Never clean with chemicals, as they may corrode the cabinet.

CHAPTER 3 | OPERATING INSTRUCTIONS

Installation

The ENV-410B Constant Current Aversive Stimulation Source and the ENV-412 Solid State Grid Floor Scrambler module may be installed in any suitable module cabinet. The SG-6001C and SG-6081C cabinet power supplies are capable of supporting up to four sources plus scramblers and A/B switches. Refer to applicable power supply cabinet manual for operation instruction of the power supply and module installation instructions. If a complete system was purchased from MED Associates, the modules will be installed in the cabinet at the factory.

Setting the Current Level and Manual Operation

Set the current level on the ENV-410B using the vernier knob (see Figure 1). The number in the OUTPUT CURRENT display represents mA, while the vernier is to the nearest .01 mA. Place the dummy load switch in the IN position and depress the Op switch. The LED indicator will illuminate and the current meter will advance.

NOTE: The small front panel meter is not a high-resolution meter.

The vernier setting is precisely calibrated at the factory, however it may be verified with a test resistor (10K recommended) and oscilloscope if desired. Place the dummy load on the OUT position for normal operation.

Remote Operation

Using the included cable, connect the 3-pin Op connector on the ENV-410B to any available output on a standard MED connection panel. The red wire supplies +28 Volts DC and the black wire is the ground (-28V on some systems) or output line. The aversive stimulus remains on for the duration of the ground (or output) signal.

Plug Configuration

The two vertical slots (Pins 2 & 3 on a three-pin Cinch Jones connector) on the ENV-410B may be used for direct aversive stimulus output. The horizontal slot is used to control the ENV-412 Solid State Grid Scrambler.

Connecting the ENV-412 Solid State Grid Floor Scrambler

When using the ENV-412, connect the aversive stimulus cable into the high voltage 3-pin socket on the ENV-410B. Using the included DB-9 cable, connect the DB-9 connector on the ENV-412 to the DB-9 connector on the ENV-406M Grid Harness.

APPENDIX A | CONTACT INFORMATION

Please contact MED Associates, Inc. for information regarding any of our products.

Visit our website at www.med-associates.com for contact information.

For technical questions, email support@med-associates.com.