

# Stereo System Monitor

## MODEL VU-40

# Instruction Sheet



### Introduction

Congratulations on your purchase of a Furman Sound Model VU-40 Stereo System Monitor. The VU-40 is a convenient rack-mount dual channel level monitor for use in sound reinforcement, concert sound, recording studio monitoring, or in any application where a quick visual check of system performance is desirable.

### VU-40 Features

- Two independent metering channels
- On/off transient muting function protects speakers
- Familiar VU meter scales
- Green/Yellow/Red LED color coding
- Peak or Average response switch
- Line Level/Power Out switch for each channel
- Line Level may be set to -10, 0, or +4 dBu
- Sixteen Power Out choices from 20 to 1260 Watts
- Ground lift, on/off switches

### Operation

#### Front Panel

The VU-40 is comprised of two 20 LED bar-graph meters, calibrated in dB like standard VU meters. They may be set with the pushbutton switch on the left side of the front panel to read either Peak (button in) or Average (button out) response. The two meter scales above the LED's are used for Average, while the two scales below are for Peak. Because audio signals are AC (alternating current), their actual voltage level varies from millisecond to millisecond. "Average" refers to the average magnitude during a time span of about 1/4 second. To approximate the action of a traditional electromechanical VU meter, choose the Average setting. Average also gives a good indication of the perceived loudness of the signal. The Peak setting indicates the highest point of the waveform, regardless of the average. Therefore, the Peak position will always result in higher readings, but it will give a truer indication of how close the signal is to clipping.

#### Rear Panel

The Input Select switches on the rear-panel select either Line (line level) or Amplifier (power output), allowing you to monitor either the inputs or outputs, respectively, of a power amp. Since each channel may be switched independently, another possibility is to use one VU-40 channel for input and the other for output. Of

course, the Line setting may be used to monitor any line level signal, even if no power amp is involved. For Line, the "zero" meter positions may be set to either -10, 0, or +4 dBu with the Line Input slide switch. This switch controls both the left and right channels (assuming both are set to the Line position with their Input Select switches). For line level metering, refer to the *white* scales on the front panel, which are calibrated in decibels. The choice of -10, 0, or +4 depends on the nominal line level of the other equipment in your system, especially the mixer and tape recorder. If in doubt, consult the manuals for that equipment.

When either or both of the Input Select switches are set to Amplifier, the VU-40 is ready to monitor the output(s) of a power amp. The *blue* scales, calibrated in percent of full power, are used. There are 16 power output choices from 20 to 630 watts for 8 ohm loads, or from 40 to 1260 watts for 4 ohm loads. Check the maximum power output for your amplifier and the rated impedance of your speakers to determine which range to use. The exact wattage corresponding to 100 percent is determined by the settings of the four Amplifier Power switches, according to the following table. The switches are shown as seen at the rear panel, from left (closest to Power Amp binding posts) to right.

<b>Amplifier Power Switches</b>					
When switches are set as follows:				The 100% reading in watts is:	
<b>Left</b>		<b>Right</b>		<b>8 ohms</b>	<b>4 ohms</b>
down	down	down	down	20	40
up	down	down	down	25	50
down	up	down	down	32	64
up	up	down	down	40	80
down	down	up	down	50	100
up	down	up	down	63	126
down	up	up	down	80	160
up	up	up	down	100	200
down	down	down	up	125	250
up	down	down	up	160	320
down	up	down	up	200	400
up	up	down	up	250	500
down	down	up	up	320	640
up	down	up	up	400	800
down	up	up	up	500	1000
up	up	up	up	630	1260

In adjusting system levels, the VU-40's meters serve as a guide to avoid overdriving the power amplifier, which can result in

clipping distortion. The amplifier's output should only rarely be allowed to exceed 100% of its rated power. The meter LED's are color coded red above 100% so you can see overloads at a glance. When only green lights show, the amp is operating in a safe range. In between, there are three yellow lights warning that the signal level is close to overdriving.

### Transient Muting

A special VU-40 feature is turn-on/turn-off transient muting. To use it, line level feeds to the power amp are routed first to the VU-40, then back out to the power amp. When AC power is applied or removed, the power amp feed will be muted for one second, eliminating loud thumps with their potential for speaker damage. With a VU-40 channel assigned in this fashion to each power amp in a system, the entire system may be switched on and off with one master switch, providing an extra degree of protection for systems operated by inexperienced personnel.

### Installation

The VU-40's connectors include both a 1/4 inch phone jack and an RCA jack for Line Level input and output for each channel. If the VU-40 is to be used only for line level monitoring, only the input jacks need be used. However, since this might necessitate splitting the signal to be monitored with a Y-cord or similar device, you may find it more convenient to use the VU-40's output jacks as well, routing the signal in and then back out. This method also provides the benefit of the transient muting feature. If desired, both the phone and the RCA output jacks can be used simultaneously. This can be useful for signal splitting, if, for instance, you want to route the signal to more than one power amp. However, only one of the two input jacks on each channel should be used as an input (the two jacks are connected together, so the other jack can be used as an output, but it will not have the one second mute). For best results, all cables carrying line level signals should be shielded.

For Power monitoring, a pair of banana jack/ binding post terminals are provided for each channel. The banana terminals are balanced, floating, and isolated, so that the VU-40 can be safely connected to any power amp output without regard for polarity. These cables do not need to be shielded. **Warning:** To avoid damage to the VU-40, do not connect a power amp output to any phone or RCA jack. Power amp outputs or speakers must connect only to the binding posts labeled "Power Amplifier."

It is possible to use the VU-40 for Power monitoring and still use the transient muting feature. Simply connect the power amp outputs to the banana jacks, set the Input Select switches to Amplifier, and route the line level signal at the point to be muted (generally just before the power amp or crossover, if used) into and out of the phone or RCA jacks.

The VU-40 is intended for mounting in standard 19" equipment racks. A logical spot to install it would be just above the amp whose output it is monitoring. Standard racks come equipped with mounting rails with holes tapped for 10-32 machine screws. Be sure to use only 10-32 screws (in particular, avoid 10-24 screws, which will fit if forced but will strip the threads). To avoid marring the panel when tightening the screws, use nylon washers under the screw heads.

### Ground Lift Switch

In many installations, hum-causing ground loops are formed by the common connection of various pieces of equipment to the power line ground, and by contact between chassis, as in a rack with metal rails. Sliding the ground lift switch up completely isolates all signal grounds from the chassis, breaking any ground loops. The chassis always remains connected to the ground pin on the AC cord for safety and to provide shielding against RF interference.

### Balanced Option

If the balanced option has been installed (Model VU-40B), XLR connectors will be present on each channel for both inputs and outputs. Balanced lines offer the benefits of cancellation of hum, noise, and RF interference which may be picked up in the interconnecting cables. For balanced connections, shielded twisted pair cable must be used. If desired, the XLR (balanced) and phone (unbalanced) outputs may be used simultaneously. However, only one of the two inputs should be used.

### Limited Warranty

The Furman VU-40 is warranted against failures due to defective parts or faulty workmanship for a period of one year after delivery to the original owner. During this period, Furman will make any necessary repairs without charge for parts or labor. Shipping charges to the factory or repair station must be prepaid by the owner; return shipping charges (via UPS Ground) will be paid by Furman.

This warranty applies only to the original owner and is not transferable. Also, it does not apply to repairs done other than by the Furman factory or Authorized Repair Stations.

This warranty shall be cancelable by Furman at its sole discretion if the VU-40 unit has been subjected to physical abuse or has been modified in any way without written authorization from Furman. Furman's liability under this warranty is limited to repair or replacement of the defective unit.

Furman will not be responsible for incidental or consequential damages resulting from the use or misuse of its products. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims should be accompanied by a copy of the original purchase invoice showing the purchase date (if a Warranty Registration Card was mailed in at the time of purchase, this is not necessary). Before returning any equipment for repair, please read the important information on service below.

### Service

Before returning any equipment for repair, please be sure that it is adequately packed and cushioned against damage in shipment, and that it is insured. We suggest that you save the original packaging and use it to ship the product for servicing. Also, please enclose a note giving your name, address, phone number and a description of the problem.

NOTE: All equipment being returned for repair must have a Return Authorization (R/A) Number. To get an R/A Number, please call the Furman Service Department, (415) 927-1225, between 8 am and 5 pm U.S. Pacific Time. Please display your R/A Number prominently on the front of all packages.

## VU-40 SPECIFICATIONS

<b>LINE IN/OUT</b>	Input Impedance:	Greater than 200K ohms.
	Sensitivity for 0 VU:	-10 dBu (.245 Vrms) or 0 dBu (.775 Vrms) or +4 dBu (1.23 Vrms)
<b>POWER AMP INPUTS</b>	Turn-on Delay:	Approximately 1 Sec
	Max. Through Level:	+22 dBu (10 Vrms)
	Connectors:	VU-40: 1/4" phone and RCA VU-40B: Phone, RCA, and XLR
<b>METERS</b>	Input Impedance:	Greater than 200K ohms.
	Sensitivity for 0 VU:	16 switch selectable calibrated sensitivities for either 20 to 630 Watts at 8 ohms, or 40 to 1260 W at 4 ohms. Banana binding post.
	Connectors:	Banana binding post.
	Accuracy:	±0.5 dB (factory set internal trim pot).