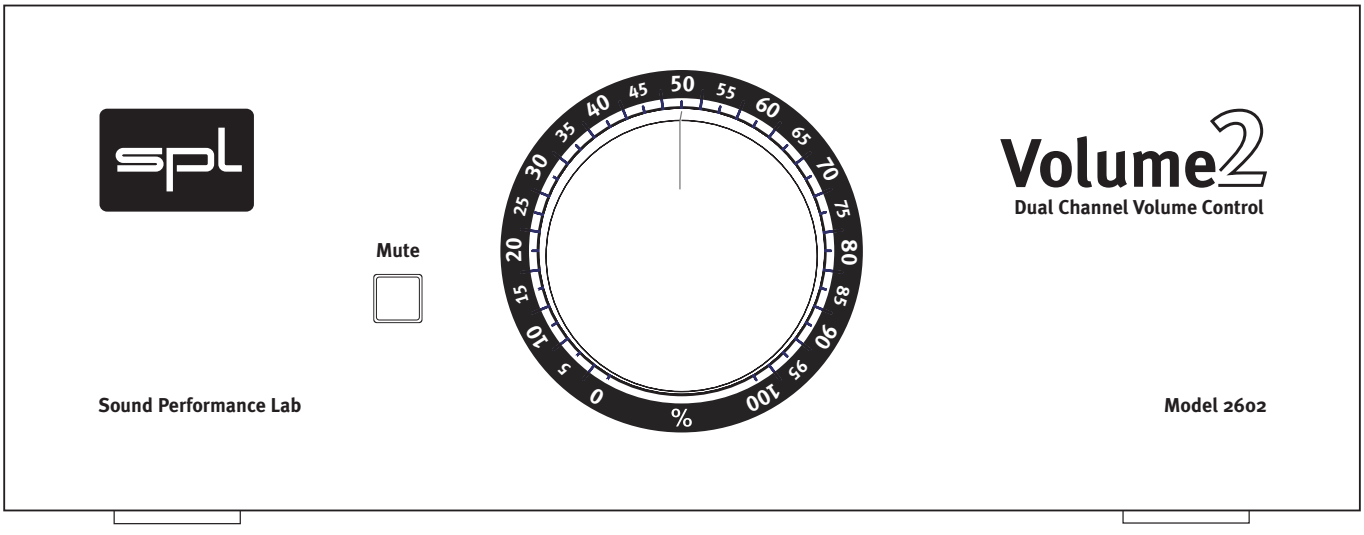
Manual



Volume 2

Model 2612

Analog Dual-Channel Volume Controller

Manual Volume 2, Model 2612

Version 1.2 – 3/2012

Designer: Wolfgang Neumann

This user's guide contains a description of the product. It in no way represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product at the time of packaging with this document.

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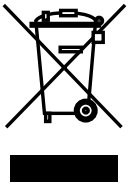
The construction of the Volume 2, Model 2612, is in compliance with the standards and regulations of the European Cummunity.

Notes on Environmental Protection



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WEEE Registration: 973 349 88

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Introduction

The Volume Controller Volume 2 serves as a system-independent analog volume regulator in all areas of audio processing and playback, including

- Stereo music production
- Movie and video post production, video computer games production
- Demanding hi-fidelity applications

Complementing the fully equipped SPL Stereo Monitoring Controller (MTC 2381), the Volume 2 focuses exclusively on the highest possible quality in active volume control. Users who do not need additional monitoring functionality provided by the MTC 2381 will find the Volume 2 an cost-effective solution without compromises. The Volume 2's design is based on active switching to avoid nonlinear frequency response introduced by impedance changes with passive designs when changing levels.

Who needs analog level control?

Simply put—most DAW (Digital Audio Workstation) users. A majority of D/A converters and sound cards provide nothing in the way of analog level monitoring control, and this means the necessity of varying signal levels at the converter outputs. The result is a lowered bit rate in the monitoring signal, which can lead to commensurate loss of audio quality.

A further, very interesting application area is in the construction of a straight, audiophile-quality stereo playback chain, where the Volume 2 is situated between the playback machine and either power amp and speakers or simply active speaker system. In such cases, the playback machine must offer analog outputs. This provides for minimal financial and electronic efforts through the most direct possible playback path.

Additional Reasons for employing the Volume 2

- High quality balancing stages with extremely good common mode rejection (minimize interferences and disturbances in the signal paths)
- The mute switch allows for very fast reaction times in cases where loud speakers or ears should be protected (for example, with computer crashes)
- Users of analog summing without monitoring facilities can cost effectively improve their systems

Special Features

The Volume 2 is built only with analog circuitry and performance, and its high quality parts in sophisticated circuitry design are prerequisites to superior audio quality:

- High end volume potentiometer and illuminated mute switch from ALPS; the potentiometer controls signals directly (without VCA or DAC circuitry)
- Balanced XLR in- and outputs
- A high quality power supply with toroidal transformer
- Massive, 45 mm diameter aluminum knobs ensure consistent, refined handling
- The elegant, compact format housing (215 x 80 mm or 8.5 x 3.1 inch) allows for flexible desktop positioning near or under a computer monitor or generally saving space in positioning

Important Notes

Be very careful to check that the rear chassis power selection switch is set to the correct local line voltage position (either 230 or 115 volts) before using your machine!

Before connecting any equipment make sure that any machine to be connected is turned off (on the Volume2 rear panel the power switch must be pushed down).

Turning the Volume 2 on and off: The Volume 2 should always be the first to be turned on before either power amp or active loudspeaker. In powering down the reverse should take place (first turn off amps/speakers followed by the Volume 2). In connecting any cables be sure that the Volume 2 and all machines affected are turned off.

It makes good sense to think about where you place the unit before connecting it. It should be positioned so that you can easily reach it, but there are other considerations. Try not to place it near heat sources or in direct sunlight, and avoid exposure to excessive vibrations, dust, heat, cold or moisture. It should also be kept away from transformers, motors, power amplifiers and digital processors.

- Do not open the case. You may risk electric shock and damage to your equipment.
- Leave repairs and maintenance to a qualified service technician. Should foreign objects fall inside the case, contact your authorized dealer or support person.
- To avoid electric shock or fire hazards, do not expose your unit to rain or moisture.
- If the danger of lightning is foreseeable, unplug the unit. Never touch a power cable during a thunderstorm—danger of life!
- Always unplug the cable by pulling on the plug only; never pull on the cable.
- Never force a switch or knob.
- Use a soft, lint-free cloth to clean the case. Avoid cleaning agents as they may damage the unit. if necessary, use an acid-free cleaning oil instead.

Power Supply

The power supply was carefully engineered to provide clean and consistent current – an important prerequisite for excellent audio. Built around a toroidal transformer, the power supply generates a minimal electromagnetic field with no hum or mechanical noise. The output side is filtered by an RC circuit to extract noise and hums inherent in commercial AC power.

All audio-related components are fed by two separate voltage regulators to minimize disturbance from other components.

An AC power cord is included for connection to the standard 3-prong IEC connector. The transformer, power cord and IEC connector are VDE, UL and CSA approved. The AC fuse is rated at 250 mA (230 V version) or 500 mA (115 V version).

Power Supply, On/Off Switching

Be sure before connecting the Volume 2 to power that the rear-chassis voltage supply is switched to the proper local rating (either 230 or 115 volts).

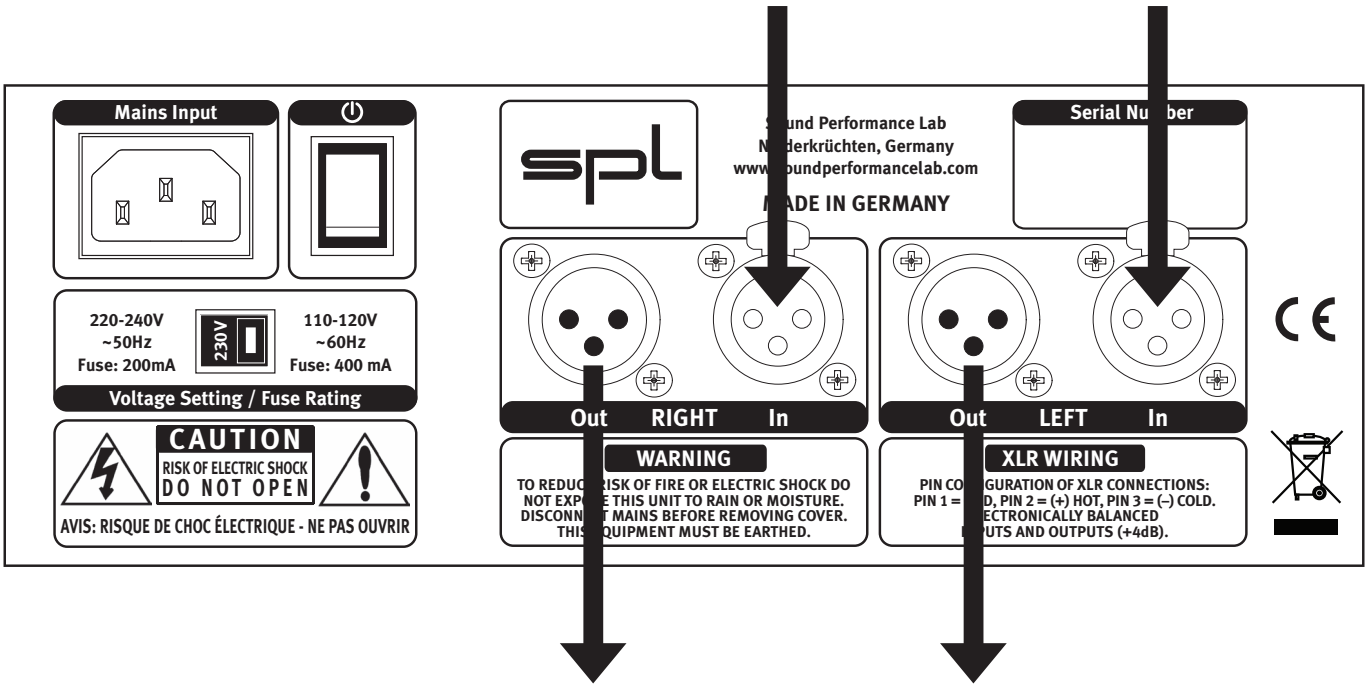
Above all, before connecting any machines, always take additional care to power down all those to be used (and move the rear-chassis power supply switch of the Volume 2 to the "down" position).

Finally, always use the following procedure in powering up your assembly:

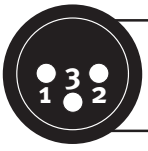
Always power on your Volume 2 first before the power amp or active speakers. When powering down, always power off the power amp or active speakers before your Volume 2. Not following this sequence can result in ear or speaker damage from high level discharges!

The Volume 2 comes with a standardized 3-pole (grounded) IEC power cord which is connected to the main power input socket (Mains Input). The transformer, cable and socket conform to VDE, UL, and CSA requirements. The actual power ratings are 250mA at 230 volts and 500mA at 115 volts.

Balanced right and left XLR Inputs to provide for stereo source connections. The nominal signal level is at +4 dB, other levels will be transmitted 1:1.



Balanced right and left XLR Outputs to provide for connections to power amps or active speakers.



Pin wiring XLR connectors
1=GND, 2=hot (+), 3=cold (-)

Unbalanced Connections (i. e. RCA, TS Jack)

You can establish unbalanced connections easily and without adaptors – for example from CD-Players with RCA outputs or to (HiFi) power amplifiers with RCA inputs. It is important to pay attention to the correct polarity of the three XLR wires. Connections to RCA and TS Jack inputs or outputs are always unbalanced. Connections to TRS inputs or outputs may be balanced or unbalanced. In any case we recommend to use readily configured cables from XLR to the respective RCA or TS/TRS connector to dispense with adaptors. Ask your dealer for configured cables. With the XLR pin wiring information from the previous page any audio expert can ensure to select or configure the right cables for connections from the 2Control to any other device.

Operation

Volume Control

The single volume potentiometer controls volume for both channels. The audio signal is controlled directly by the potentiometer—thus no VCA or DAC regulators in the paths which tend to produce bigger tolerances and distortions.

Calibrating the Monitoring System

Both the signal level which is send to the Volume 2 controller as well as the input sensitivity of the power amps or active speakers should be matched to ensure a proper overall gaining. An inappropriate adjustment might happen when, for example, a (fairly small) 10% volume level setting might already result in an extremely high playback level.

Important: You can encounter very loud signals during calibration, so be sure to keep your ear protection on. For calibration we recommend measurement with a Real Time Analyzer (RTA) or a SPL Meter (in this case, SPL translates to "Sound Pressure Level"). First the measuring machine and microphone are set up at the listening position. Then one produces in the DAW a sound file with "pink noise", which is played back and measured.

Each measurement should be done through one channel and loudspeaker at a time. A recommendable calibration is the playback of a 83db SPL reference signal at the playback location—a common reference volume level. The DAW output level should be adjusted to 0 dB, and next, the power amp's or active speaker's input level should also be set to 0 dB. Now the Volume 2 level control is adjusted until the RTA or SPL Meter measures 83 dB with the pink noise playback. For a perfectly matched gaining the Volume Control would now be set above a 50% scale position. At this point one can record or note the exact value for 83 dB. Should this 83 dB SPL occur markedly above a 60-80% scale position, one should lower the power amp's/active speaker's input sensitivity (=higher dB value). On the other hand, the power amp's/active speaker's input sensitivity should be raised if the 83 dB SPL point is reached far before the 60% control level. In cases where regulating power amp/active speaker inputs is not enough, one may reach good values by changing the D/A converter output level (for example from +4 dB to 0 or -10 dB in cases where this switch option may exist). In any case, the converters should always be driven at full scale from the DAW.

Operation

Mute

You guessed it ... this switch mutes all speaker outputs. It is particularly valuable in panic situations, for example, if the computer crashes and its converters suddenly output uncontrolled high level noise. It is also very useful in any case where one simply wants silence without changing the Volume settings—e. g. to answer the telephone.

IMPORTANT: When making any cable connection changes, you should not only activate the mute switch, but follow the on/off powering procedures noted on p. 6.

Specifications

Inputs/Outputs
Instrumentational amplifier, electronically balanced (differential), transformerless

Nominal Input Level	+4 dBu
Input Impedance	=22 kOhm
Output Impedance	‹ 600 Ohm
Max. Input Level	› +20 dBu
Volume Gain	∞ bis -4 dB

Measurements

Frequency Range (100 kHz = -3 dB)	10 Hz-100 kHz
CMRR	› 60 dBu@1 kHz
THD & N (@ +15 dBu Input Level)	› -100 dBu
S/N A-weighted	-102 dBu
Crosstalk L/R (@ 1 kHz)	› -80 dBu
Dynamic Range	120 dB

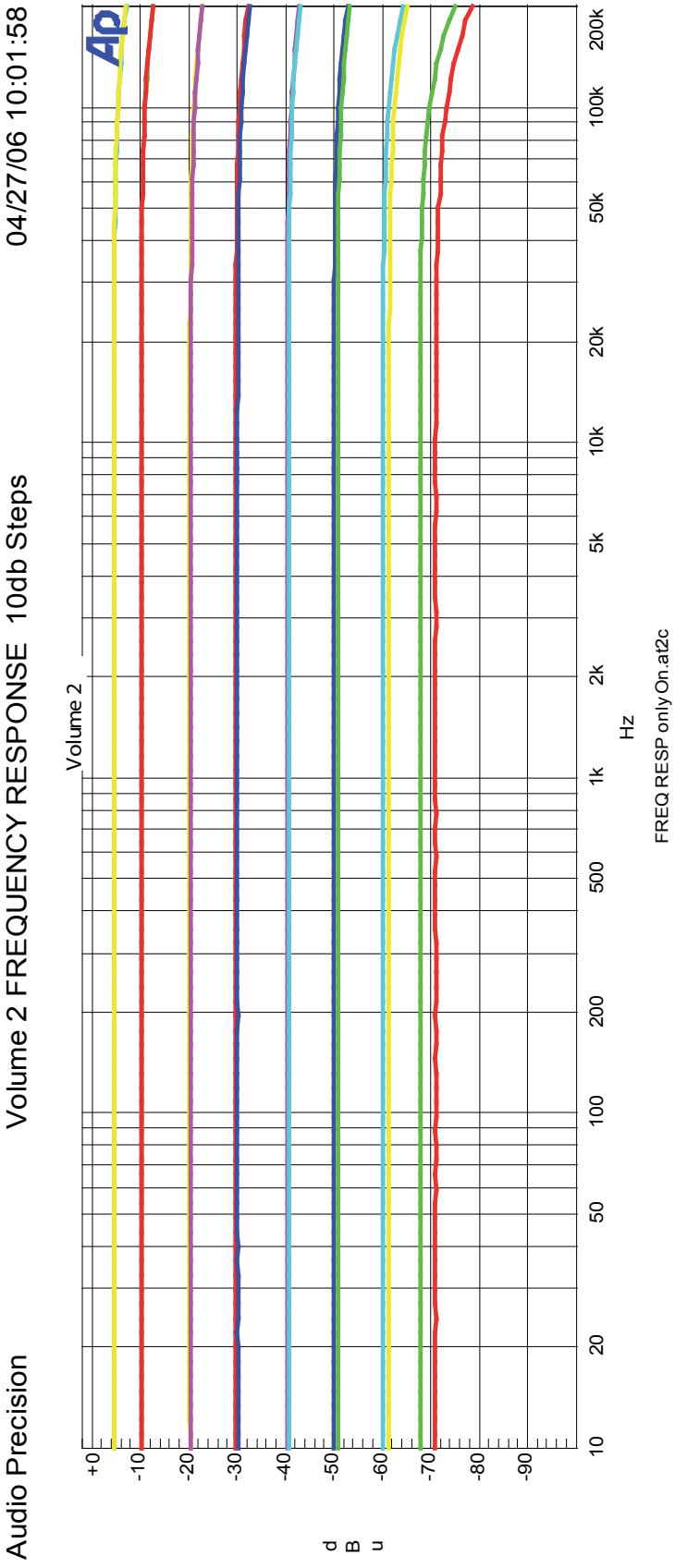
Power Supply

Toroidal transformator	3,5 VA
Fuse	250 mA/230 V, 500 mA/115 V
Voltage Selector	230/50 Hz ‹› 115 V/60 Hz
Power Consumption	ca. 15 W

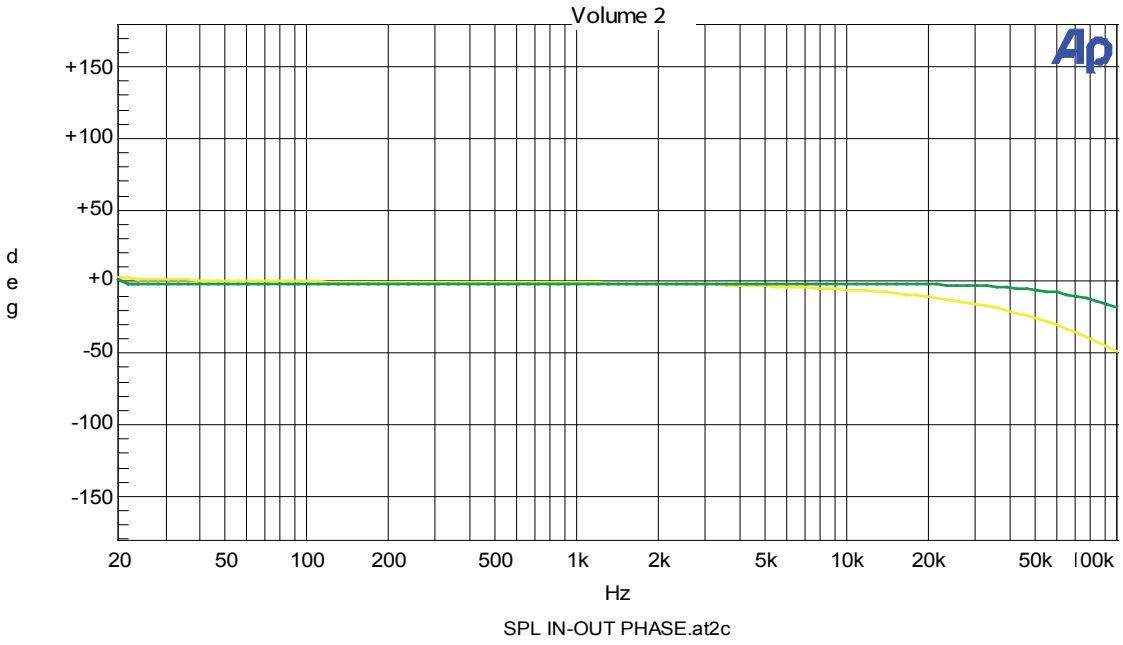
Dimensions & Weight

Housing	215 x 80 x 220 mm/ 8.5 x 3.1 x 8.8 inches
Depth incl. Potentiometer, Sockets	245 mm/9.8 inches
Weight	1.6 kg/3.52 lb

Notes:
0 dBu = 0.775 V
Subject to change without notice.


Audio Precision
Volume 2 FREQUENCY RESPONSE 10db Steps
04/27/06 10:01:58
Volume 2
+0
-10
-20
-30
-40
-50
-60
-70
-80
-90
d
B
u
10
20
50
100
200
500
1k
2k
5k
10k
20k
50k
100k
200k
Hz
FREQ RESP only On.at2c

Audio Precision Volume 2 INPUT/OUTPUT PHASE vs FREQUENCY 04/27/06 09:49:58



Audio Precision Volume 2 FFT SPECTRUM ANALYSIS +6dB 04/27/06 09:47:31