Park Audio

GS series

GS 4d
GS 5d
GS 6d
GS 7d
GS 8d

TWO-CHANNEL
PROFESSIONAL POWER AMPLIFIERS
WITH DSP

Owner's Manual

UNPACKING

The manufacturer's quality control system provides for careful examination of each product before it leaves the factory to ensure its flawless appearance. After unpacking, please, check the unit for any physical damage. In case of damage, please, contact your local dealer. Keep the shipping carton and all packing material, as you may require them for reshipment of the unit.

ACCESSORIES

1. Power Cord	1 pc.
2. Dust filter	2 pcs
3. Owner's Manual	1 pc.
4. Warranty	1 pc.

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AVIS
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

CAUTION!

The amplifier runs on 230 V AC voltage. Removing the cover will expose you to a potentially dangerous voltage! Do not use the unit if the electrical power cord is frayed or broken.
Power is supplied from 230 V AC single-phase grounded 50/60 Hz source!

CAUTION!

To reduce the risc of fire or electric shock, do not expose the amplifier to rain or moisture!

CAUTION!

*The amplifier can yield **dangerous** output voltage! Do not touch the non-insulated cable parts, connected to the unit in operation!*

CAUTION!

The high sound pressure caused by the high output signal, applied to speaker systems, may endanger your hearing. Please, take care to observe the required safety precautions.

WARNING SIGNS:

Important information! Intended to warn the user about any important information contained in this Owner's Manual.

Hazardous voltage inside! Intended to warn the user about electric shock hazard due to high voltage inside the product.

This sign next to the output terminals warns about dangerous voltage while in operation.

GENERAL

The two-channel professional power amplifiers **GS** series with DSP are designed for sound signal high-fidelity amplification within professional sound reproduction systems.

The amplifiers are equipped with built-in **DSP** engine (**DFM audio**, Germany), which provides the precision processing of the audio signal. To control the parameters of the amplifier (or group of amplifiers) the program **NetControl** is used, the amplifiers are connected via the **ETHERNET** interface.

To ensure faultless operation of amplifiers, please, take time to read this Manual before use.

This manual applies to any GSd series amplifier:

– **GS4d** – 2 x 2000 W into 2 Ohms;
– **GS5d** – 2 x 2500 W into 2 Ohms;
– **GS6d** – 2 x 3000 W into 2 Ohms;
– **GS7d** – 2 x 3500 W into 2 Ohms;
– **GS8d** – 2 x 4000 W into 4 Ohms;.

ATTENTION!

*The **GS4d**, **GS5d**, **GS6d**, **GS7d, GS8d** amplifiers have the same design and functional features and differ only in the schematics elements, output power and weight. Unless specified otherwise, the word "amplifier" hereinafter applies to any of the above models.*

To ensure the most advantageous and faultless operation of the amplifier, please, read this Manual before use.

WARNING!

Make sure to take all precautions where required.

Please, follow all instructions and guidelines.

To avoid any risk of electrical shock and/or fire hazard, please, do not expose this unit to rain or moisture. Do not use this unit near open water.

Use dry cloth to clean the unit.

Do not block fan vents.

Do not place the unit near heating radiators, furnaces or other heat-emitting devices.

Do not connect this unit to an ungrounded power supply line.

Protect the power cord against damage.

Disconnect the unit from power supply in case of thunder or during downtime.

In case of malfunctioning, caused by water or any other foreign matter inside or when the unit has been dropped, or the power cord has been damaged, or the unit has been found faulty, please, consult qualified personnel.

WARNING!

*The amplifiers **GS4d**, **GS5d**, **GS6d**, **GS7d**, **GS8d** yield high output power. The manufacturer shall not be held responsible for any damage to the speakers caused by excessive power from the unit.*

DESIGN FEATURES

Physical Design

The amplifier is enclosed in a metal (steel) case of 2U height. Amplifier front panel is made of aluminum.

The amplifier must be fixed at four points, when installed in the RACK 19 "(two points in front and two at the rear).

Power Supply Source

Switchable. Individual for each channel.

Cooling System

Forced, cooling rate smooth adjustable system.

Four fans, two per each channel. Backward air flow direction.

Dust Filter

Front panel filter easily removable/replaceable for periodic maintenance.

Power Amplifier Unit

Based on TD Class schematics.

TD Class power amplifier combines the best features of both Class D and analogue amplifiers. The amplifier boasts the efficiency comparable to Class D amplifiers and sound quality typical of analogue amplifiers.

Analog inputs

The amplifier is equipped with balanced analog inputs (**XLR** female).

The use of balanced inputs provides for an essential reduction of the environment-induced hum and noise interference with long input connecting cables.

*For **DSP** processing, the analog signal is converted to digital using four 24-bit A/D converters, operating at 96 kHz. The dynamic range of A/D and D/A converters is 120 dB.*

AES input

Input of channel 1 can be switched to digital input mode.

*A digital **AES/EBU** two-channel audio signal can be applied to input. Sound signals can be sent to an amplifier from a digital mixing console or other device, that generates a digital audio signal **AES/EBU** (AES3). The **AES/EBU** inputs have balanced transformers and are protected against static electricity. Built-in sample rate converters support a wide range of input formats (16-24 bit / 44.1-192 kHz), converting any of them into internal format 24bit / 96kHz.*

ETHERNET connectors

Two equivalent ports for connection to the **ETHERNET** network.

*Provide the ability to configure and remotely control the amplifier over a network, using the **NetControl** software. The built-in router allows you to connect multiple amplifiers in chain.*

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Line Outputs

Switchable. **XLR** (male).

Allows to appply signal to another amplifier. SWITCHED OUTPUT located on the rear panel allow to choose signal applied to line outputs.

Note.

** In the case of amplifier power failure, the line output is connected to the line input via relay, providing uninterrupted signal transit.*

Switches Position	CH1		CH2	
	Input Signal	Output Signal	Input Signal	Output Signal
THRU	CH1 Analog Signal	CH1 Input Analog Signal (line output connected parallel to input)	CH2 Analog Signal	CH2 Input Analog Signal (line output connected parallel to input)
	AES1-2 Digital Signal	AES1-2 Digital Signal (line output connected to input via buffer amplifier*)	Signal is not applied to amplifer	CH2 Input Analog Signal (line output connected parallel to input)
POST DSP	CH1 Analog Signal	DSP engine OUT3 Output Analog Signal**	CH2 Analog Signal	DSP engine OUT4 Output Analog Signal**
	AES1-2 Digital Signal	DSP engine OUT3 Output Analog Signal**	Signal is not applied to amplifer	DSP engine OUT4 Output Analog Signal**

*** The amplifiers have DSP module with four inputs (IN1-IN4). Only inputs IN1 and IN2 are used, inputs IN3 and IN4 are not used. Therefore, to receive a processed signal at the line outputs, you need to enable signal routing to the outputs OUT3 and OUT4 from the inputs IN1 and/or IN2.*

DSP engine

The amplifier is equipped with a flexible and powerful high-end **DSP** from **DFM audio**, Germany.

*The close integration of processing and amplification allows the **DSP** to monitor and better respond to amplifier behavior, making dynamics processing far more accurate and effective than that typically achieved with separate components. The onboard **DSP** offers four channels of crossover filters, parametric **EQ**, **FIR** filter and alignment delay – everything needed to optimize a loudspeaker system.*

*Flexibly configurable **RMS** and **PEAK** limiters in each channel ensure reliable loudspeakers overload protection.*

***DSP** settings control is performed via **ETHERNET**, using personal computer with the installed **NetControl** software.*

For use in large installations, the processor has the tools for group control of many amplifiers simultaneously. The amplifier can be supplied with pre-formed library of passive speakers.

Software is designed for group control of a large number of amplifiers simultaneously. The program provides the ability to create virtual systems, which can be automatically merging with real amplifiers.

It is based on the work with Speaker and Preset libraries. The amplifier can be supplied with pre-installed Speaker libraries. Also, the user can update the Speaker library or create his own library. When creating a sound system, the user simply selects the desired type of loudspeaker from the library.

*The **NetControl** installation package and user manual can be downloaded from parkaudio.ua ("Downloads" section on the **GSd** amplifier page).*

User Interface

LCD display, LED indicators and controls (encoder and 2 buttons with illumination).

*LED indicators on the front panel shows a signal presence, limiters activation and the overload of each amplifier channel. Encoder, LCD and buttons provide local access to navigation and **DSP** control.*

Removable Power Cord

NEUTRIK **powerCON 20A**.

This feature is provided for convenience of transportation and rack mounting.

FUNCTIONAL FEATURES

Output Short-Circuit Protection

Individual per each channel. Protects the output stage of the power amplifier against short-circuiting, as well as limits the output current when a maximum-level sine signal is applied continuously to 2-Ohms loudspeaker.

Overload Protection

The double-stage overload protection system, independent for each channel, protects the output stage and optimizes the quality sound under overload.

In the event of short overloads (for example, caused by a sharp decrease in the complex load resistance), only the current protection of the output stage is activated. It limits the output transistors current to safe level. Protect threshold allows to give full output power shortly, even on case of very low load.

In case of a more continuous overload, the protection system activates the built-in Clip-limiter, which reduces the level of the input signal.

DC Output Protection

Independent for each channel. With switchable power supply. Prevents DC damage to loudspeakers.

The amplifier's schematics precludes transit of any clicks or noise during the power-on/off transition process.

Protection of loudspeakers against DC damage is ensured for each pair of channel by individual power supply units which are disabled in the event of output DC voltage or any powerful LF fluctuations. In case the protection system becomes active on all channels and both power supply units become disabled, all indicators go off.

The amplifier can be restarted with the POWER toggle switch, by way of turning the amplifier off and turning it on, about 2 minutes later again.

High Frequency Protection

Independent for each channel. Prevents any damage to HF drivers as might be caused by non-musical signals of powerful high frequency spectrum.

Should any powerful high frequency fluctuations occur on the output either as a result of poor contact in the input cable connectors, or being send to the amplifier's input by any other device (such as a crossover or mixing console), the protection system activates the built-in optoelectronic Clip-limiter to reduce the input signal level. Thus the protection system effectively prevents any damage to tweeters as might be caused by non-musical signals of powerful high frequency spectrum.

Thermal Protection

Independent for each channel. Protects the amplifier's output stage against overheating.

The amplifier may stop functioning only in case of the fan breakdown or blocked air flow. In this case upon reaching 85°C, the independent protection system disables the respective channel of the amplifier. The CLIP LED goes on and the SIGNAL LED of the affected channel goes off. The amplifier resumes its operation in the reverse order. As soon as the amplifier cools down, the affected channels gradually regain their amplification level up to the set value.

Soft Start

Reduces the power-on inrush current.

The soft start system is provided to reduce inrush current to the amplifier and to minimize the noise contributed by the amplifier to the power mains during the power-on process.

Soft Signal Start

Ensures smooth power-on sound signal rise.

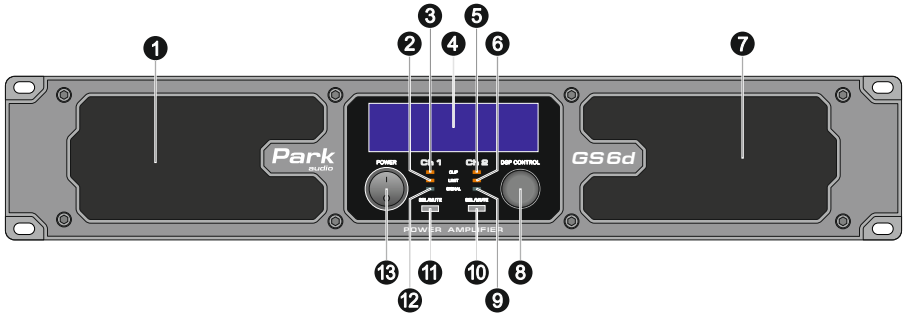
During the power-on process, this feature ensures smooth gain from zero to the maximum level to provide for a smooth rise of the sound level emitted from the loudspeakers.

Overvoltage Protection System

Relay system. Used to protect the amplifier against overvoltage in the mains.

In case of accidental connection of the amplifier to incorrect-wired mains, the inter-phase voltage of 400V may be applied to the amplifier. In this case the protection system will block the mains connection to the power supply. Only the protection system stand-by power supply unit remains in operation. The system activates, whenever the mains voltage exceeds ~265V. The amplifier automatically resumes operation after the mains voltage goes down to ~260V.

FRONT PANEL



❶❼ Dust filters.

❷❻ **LIMIT** – Channel 1 and 2 limiters activation LEDs.

❸❺ **CLIP** – overload LEDs for channels 1 and 2.
Indicating overload and distortion occurrence.

❹ 2 x 20 characters LCD display.

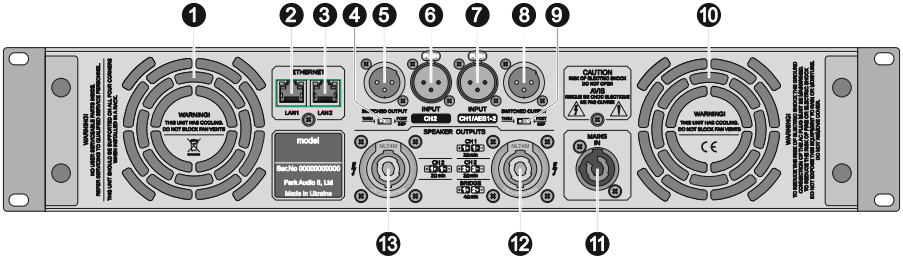
❽ **DSP CONTROL** – encoder knob for the menu navigation and parameters setting.

❾⓬ **SIGNAL** – индикаторы сигнала на выходе каналов 1 и 2.

❿⓫ **SEL/MUTE** – channel selection for setting parameters/ mute corresponding channel.

⓭ **POWER** switch.

REAR PANEL



❶❿ Output fan grill.

❷❸ **ETHERNET LAN1, LAN2** – RJ45 connectors for ETHERNET network connection.

❹❾ Line output switches for channels 2 and 1, respectively.

❺❽ **SWITCHED OUTPUT** – line output for channels 2 & 1, respectively. (**XLR** male). Signals applied to line outputs are shown in DESIGN FEATURES, Line Outputs).

❻ **INPUT CH2** – Channel 2 balanced line input (**XLR** female). Used for applying analog input signal for channel 2.

❼ **INPUT CH1/AES1-2** – balanced line input (**XLR** female). Used for applying analog input signal for channel 1 or applying digital signal to channel 1 and 2.*

⓫ **MAINS IN** – mains cable connector.

⓬⓭ **SPEAKER OUTPUTS** – output **SpeakOn** connectors for speakers connection. Connectors pin assignment are marked on the amplifier rear panel.

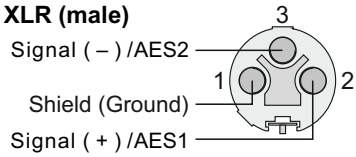
Note.

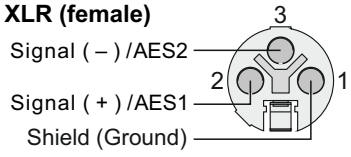
*Analog/digital signal choice is performed via local amplifier interface or **NETControl** software.

INPUT AND OUTPUT CONNECTORS

Input Connectors

Use **XLR** (male) connectors to connect to the amplifier inputs and **XLR** (female) connectors to line outputs. See the wiring on the figures below.



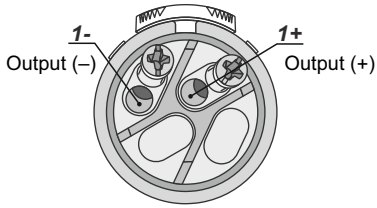


Output Connectors

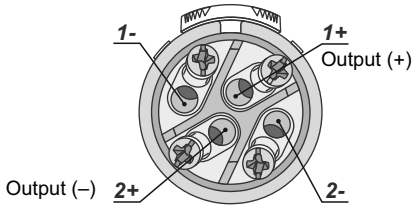
Use SpeakON **NL4FX** (**NL2FC**) or **NL4FX** (**NL4FC**) connectors to connect speaker systems to the amplifier individual channel outputs. For connection of both channels via a single cable, use SpeakON **NL4FX** (**NL4FC**). See the wiring on the figures below.

CAUTION! Never attempt to jumper or otherwise link up any pins of output connectors.

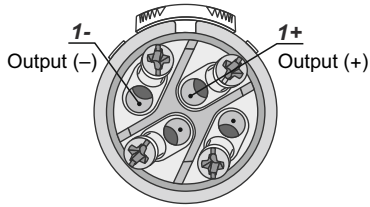
NL2FX for individual channel linking up



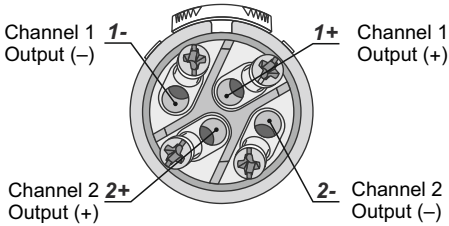
NL4FX for BRIDGE MODE



NL4FX for individual channel linking up



NL4FX for linking up two channels with a single connector



Use a POZIDRIVE PZ1 screwdriver to connect cables to connectors. Never use a PHILIPS screwdriver. See the detailed wiring information at http://www.neutrik.com

CABLE REQUIREMENTS

Input Cables

Make sure to use only shielded cables whether balanced or unbalanced. Shielding when properly grounded protects a signal against external electrical interference. As a rule, unbalanced lines of over 3 meters long are not acceptable. Greater distances require a balanced cable.

Avoid placing input cables close to power cords or power transformers.

Output Cables

The amplifier is capable of delivering high level output current; therefore, the wire gauge used for speaker cables is particularly important. Inadequate wire gauge adds significant resistance to the speaker's own impedance, reducing the power which is actually delivered to the speaker. It will also result in a decreased damping factor and possible fire hazard.

Since the power applied to the loudspeaker is of primary concern in system design, we have included the table below to allow you determine the appropriate wire gauge for your application.

Power Loss in a 10-meter Cable

Wire Gauge (mm^2)	Cable Resistance (Ohms)	Cable power loss		
		2Ohm load	4Ohm load	8Ohm load
1.50	0.24	10.7 %	5.7 %	2.9 %
2.00	0.18	8.3 %	4.3 %	2.2 %
2.50	0.15	7 %	3.6 %	1.8 %
4.00	0.09	4.3 %	2.3 %	1.1 %
6.00	0.06	2.9 %	1.5 %	0.7 %

The table shows the percentage of the power loss in a 10-meter copper multiple-core cable. This table reflects the power loss as a percentage of the output power of the amplifier applied to the load. Use this table to determine the power loss to the load at other cable lengths. For example, if you plan to deliver 1000Watts to 2-Ohms load through 20m of 2.5-mm2 cable, the power loss in the cable would be 7 % x 2=14 % of 1000W or 140W lost in the cable.

AC POWER REQUIREMENTS

Use 230 V 50/60 Hz single-phase grounded power supply mains for amplifier.

The quality of the AC power supply mains is of prime importance for the amplifier functioning. The amplifier should be powered from the mains designed for at least 1.5 times the average current consumed by the amplifier.

Never try to connect the amplifier to a household power supply mains.

Use the power cord supplied. The power cord supplied with a **GS6**, **GS7** or **GS8** amplifier has only a PowerCon connector on one side. The other side of the cord should be connected either directly to the power distributor terminal box or to an industrial-type three-pin plug. Use a plug designed for the current rating not less than the average current consumed by the amplifier.

Connection and wiring must be performed by a qualified technician.
Never use household-type electric plugs.

Prior to plugging, please, make sure that there are no other devices consuming much AC current, as the normal operation of such several devices may be impossible. In the event of line voltage sag, the unit will continue to operate normally, albeit with less power.

The actual AC current consumption by the amplifier depends on the type of the music program and the load impedance. While installing the audio systems, in order to optimize the power wiring, please, note that for reproduction of typical audio material at the full output level, the average current consumption rate is as follows:

– 4/7 A for **GS4d** into 4/2 Ohms;
– 5/9 A for **GS5d** into 4/2Ohms;
– 6/11 A for **GS6d** into 4/2 Ohms;
– 7/11 A for **GS7d** into 4/2 Ohms;
– 8 A for **GS8d** into 4Ohms.

*** Note:** The above ratings are given for a crest-factor 3 musical signal. Some modern music genres may have less crest factor, which may lead to increased current consumption.

In order to minimize the AC current hum and noise, make sure to plug all audio devices interconnected with signal cables, into the same mains outlet.

RACK-MOUNTING REQUIREMENTS

The amplifier is designed to fit a standard 19” rack. While mounting, make sure to provide unhindered air access to the front and rear sides of the rack. The fan blows air backwards. It is not necessary to leave empty space above or below the amplifier. Prior to installing the amplifier into the rack, remove the rubber feet from the amplifier bottom panel. Having done that, put the amplifier into the rack and secure it in place with four screws with washers. The manufacturer strongly recommends to secure the amplifier rear brackets to the rack, too. Where required, use a transition bracket (optional) to extend the mounting depth of the amplifier mounted into the rack.

MAINTENANCE

Cleaning of Dust Protective Air Filter

No special tools are required for removing the filter. Just grip it and pull. Wash the filter with any detergent, flush it with water, let it dry and re-install.

In case the filter is worn out, replace the filter with a spare one supplied.

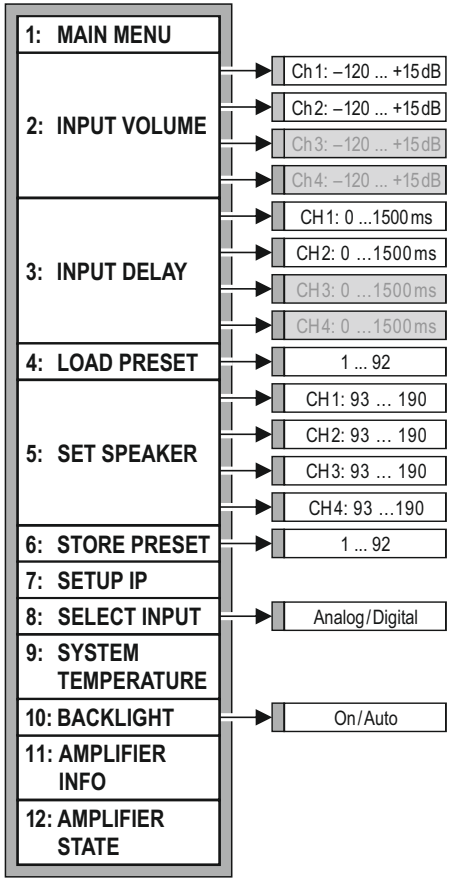
ATTENTION! *Never install a wet filter.*

Do not dry the filter with hot air or expose it to direct sun rays.

AMPLIFIER SETUP

*DSP settings control is performed via **ETHERNET**, using personal computer with the installed **NetControl** software*.*

*Some **DSP** engine settings are available in the amplifier system menu.*



INPUT VOLUME – signal level setting for each channel ******.

INPUT DELAY– delay setting for each channel. ******.

LOAD PRESET – presets loading from Preset Library (memory cell 1 ... 92). Applied to all channels simultaneously.

SET SPEAKER – Speaker presets loading from Speaker Library (memory cells 93 ... 190).Applied to all channel separately.

STORE PRESET – current setting store as user preset into Preset Library (in one of the memory cells (1 ... 92).

SETUP IP – amplifier IP address setting.

SELECT INPUT – input mode choise (analog or digital AES/EBU).

SYSTEM TEMPERATURE – amplifier temperature.

BACKLIGHT –LCDbacklight activation***.

AMPLIFIER INFO – information about amplifier.

AMPLIFIER STATE – amplifier state information. Shows error codes.

Note.

*The **NetControl** installation package and user manual can be downloaded from parkaudio.ua (''Downloads'' section on the **GS4d**...**GS8d** amplifier page).

****** Input channels Ch3 and Ch4 are not used. backlight

******* Auto backlight is not available.

Enter the menu by short clicking the encoder knob **DSP CONTROL**.

Choose the needed menu item by knob **DSP CONTROL** rotation.
Current menu item is marked by the arrow cursor (left and right).

To make changes in the current menu item short click the **DSP CONTROL knob.**

Rotating the **DSP CONTROL knob** set the needed parameter setting.

In this menu item (**VOLUME**) signal level for each channel is set. The desired channel is chosen by clicking **SEL/MUTE** button for the corresponding channel. The channel number is indicated in the upper line of the LCD-display. Rotating the **DSP CONTROL knob** changes parameter with step 0.1dB. The step can be changed from 0.1dB to 1dB and vice versa by short clicking **DSP CONTROL knob**.

No parameters confirmation needed. It is enough to choose another channel or exit from current menu item. To exit current menu item press and hold **DSP CONTROL** knob.

When the power is turned off, the amplifier remembers the current settings. When amplifier is turned on again, all previous settings will be restored automatically.

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

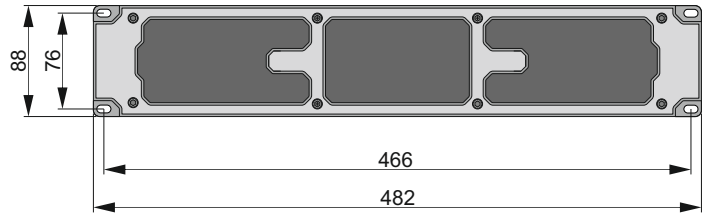
Output Power:	
– GS4d	**2 x 2000 W** (2 Ohm, ~230 V) **2 x 1500 W** (4 Ohm, ~230 V) **3600 W** (bridge, 4 Ohm, ~230 V) **2700 W** (bridge, 8 Ohm, ~230 V)
– GS5d	**2 x 2500 W** (2 Ohm, ~230 V) **2 x 2000 W** (4 Ohm, ~230 V) **4500 W** (bridge, 4 Ohm, ~230 V) **3600 W** (bridge, 8 Ohm, ~230 V)
– GS6d	**2 x 3000 W** (2 Ohm, ~230V) **2 x 2300 W** (4 Ohm, ~230V) **5400 W** (bridge, 4 Ohm, ~230V) **4140 W** (bridge, 8 Ohm, ~230 V)
– GS7d	**2 x 3500 W** (2 Ohm, ~230 V) **2 x 3000 W** (4 Ohm, ~230 V) **6300 Вт W** (bridge, 4 Ohm, ~230 V) **5400 Вт** (мост, 8 Ом, ~230 V)
– GS8d	**2 x 4000 W** (4 Ohm, ~230 V) **2 x 2200 W** (8 Ohm, ~230 V) **7200 W** (bridge, 8 Ohm, ~230 V)
Peak Output Voltage:	
– GS4d	**135 V**
– GS5d	**150 V**
– GS6d	**165 В**
– GS7d	**180 V**
– GS8d	**210 V**
Frequency Responce *	**20 Hz – 20 kHz** (±0.2 dB, Pnom., Ryjv.)
Signal-to-Noise Ratio:	**100 dB** (unweighted, Analog Input) **105 дБ** (unweighted, AES/EBU Input)
Total Harmonic Distortion:	**0.02 %** (1 kHz, Rном.) **0.05 %** (20 Hz – 20 kHz, Rnom.)
Damping Factor	**800** (1kHz, 8 Ohm)
Channel separation	**60 dB** (1kHz)
Slew Rate:	**60 V/µs** (channel) **120 V/µs** (bridge)
Voltage Gain	**35 dB**
Input Impedance	**10 kOhm** (balanced)

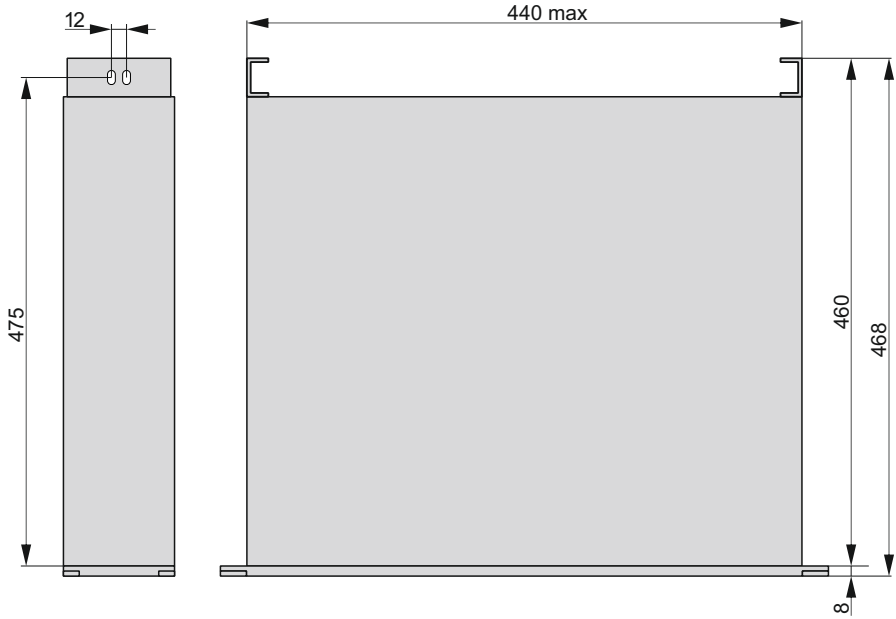
Max. Input Level	**+15 dBu**
Signal Latency:	**1.16 ms** (at 48 kHz) **529 µs** (at 96 kHz)
ADC / DAC	**24 bit, 96 kHz** (AKM)
Digital Input	**AES / EBU, 24 bits, 32–96 kHz** (built-in Sample Rate Converter)
DSP Parameters SHARC DSP,	**96 kHz sampling rate / 40 bit floating point** **ADC: 120dB SNR , -100 dB THD/N,** **+18 dBU Input Level** **DAC: 120 dB SNR , -104 dB THD/N,** **+18 dBU Output Level**
DSP Functions	**Crossovers. 20 PEQ per channel.** **Delay up to 1.5sec/channel.** **RMS and Peak Limiters.** **Two banks of FIR filter (500 tap each) per channel.** **Speaker library (96 speaker).** **92 user presets.**
Power Requirements	**~230 VAC, 50/60 Hz**
Weight:	
– GS4d	**13.5 kg**
– GS5d	**13.7 kg**
– GS6d	**13.9 kg**
– GS7d	**14.1 kg**
– GS8d	**14.3 kg**
Dimensions:	
– width	**482 mm**
– height	**88 mm (2U)**
– height plus feet	**96 mm**
– depth	**468 mm**
– depth in rack	**460 mm**

OPERATING CONDITIONS

Air temperature:	**5 ... 35°C**
Atmospheric pressure:	**86.6 ... 106.7kPa (650 – 800 MMHG)**
Relative humidity:	**less than 80%**

DIMENSIONS





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