TAIDEN®

Digital Audio Power Amplifier

Professional Audio Power Amplifier

Installation and Operation Manual

V 1.1

Contents

Remark:

- All rights reserved for translation, reprint or reproduction
- Contents may change without prior announcement
- All technical specifications are guideline data and not guaranteed features
- TAIDEN Co., Ltd. is not responsible for any damage caused by improper use of this manual
- The equipment must be connected to earth!
- This product conforms to the rules of the European directive 2014/30/EU
- To protect your hearing, avoid high pressure level on earphones. Adjust to a lower and convenient level
- If any detailed information is needed, please contact your local agent or **TAIDEN** service center in your region. Any feedback, advice and suggestion about the products is appreciated
- **TAIDEN** is the registered trademark of TAIDEN Co., Ltd.
- In order to extend the life time of the whole system, we strongly recommend that the congress system be scheduled to shut down every day in the evening when not in use

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
6. The MAINS plug serving as a disconnection device, should be easy to operate.
7. The apparatus should be connected to the MAINS socket-outlet with protective earth.
8. Clean only with dry cloth.
9. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
10. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
11. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
12. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
13. Only use attachments/accessories specified by the manufacturer.
14. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
15. Unplug this apparatus during lightning storms or when unused for long periods of time.
16. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
17. Do not place the equipment on any uneven or unstable stand; original product package or appropriate package should be used to avoid damage caused by strong impacts during transportation.
18. Power supply cords: AC 100 V - 240 V 50/60 Hz
19. For service, please contact the nearest TAIDEN Service Center.
20. All TAIDEN products are guaranteed for definite time (see the WARRANTY CARD for details) excluding the following cases:
    A. All damage or malfunction caused by human negligence;
    B. Damage or malfunction caused by improper operating by operator;
    C. Parts damage or loss caused by disassembling the product by non-authorized personnel.
21. Use ONLY specified connection cable to connect the system equipment.
22. Upon receipt of the product, please fill out the Warranty Card enclosed and post it to TAIDEN Service Center.

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION: To reduce the risk of electric shock, DO NOT open covers, no user serviceable parts inside. Refer servicing to qualified service personnel only.

CAUTION: DO NOT use alcohol, ammonia or petroleum solvents or abrasive cleaners to clean the devices.

The lightning flash with an arrowhead symbol, with an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Important Safety Instructions

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: To reduce the risk of fire or electric shock, DO NOT expose units to rain or moisture.

Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical or applicable local codes.

Power Disconnect: Units with or without ON – OFF switch have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON – OFF switch is in the ON position. The power cord is the main power disconnect for all units

WARNING: The apparatus should be connected to a mains socket outlet with a protective earthing connection.

About this manual

This manual is a comprehensive guide to the installation and operation of the **TAIDEN** Digital Audio Power Amplifier (PA). It includes the detailed description of the functions and interfaces of the PA, including connection, installation, and operation.

The manual is divided into the following chapters:

Chapter 1: Overview

An introduction to the Digital Audio Power Amplifier.

Chapter 2: Functions and indications

Detailed descriptions of the functions and indications of the Digital Audio Power Amplifier.

Chapter 3: Connection and operation

Detailed descriptions of the connection and operation of the Digital Audio Power Amplifier.

Chapter 4: Specifications

Main technical parameters of Digital Audio Power Amplifier.

This manual is applicable to:

HPA-2016/02

Digital Audio Power Amplifier (2 channels, 2 × 200 W)

HPA-2016/04

Digital Audio Power Amplifier (4 channels, 4 × 200 W)

Chapter 1 Overview

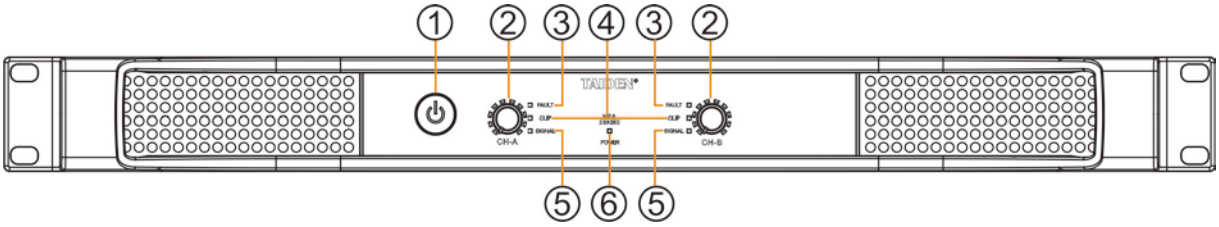
Digital audio power amplifier (hereinafter referred to as "PA") adopts the high efficiency class D power amplifier and switching mode power supply technology, the efficiency under conventional conditions is more than 80%.

PA adopts the active power factor correction technology, can adapt to all the global supply network, and plug & play anywhere; the electric energy can be gotten from the supply network stably and evenly, thereby minimizing the interference of the supply network, and improve the utilization efficiency.

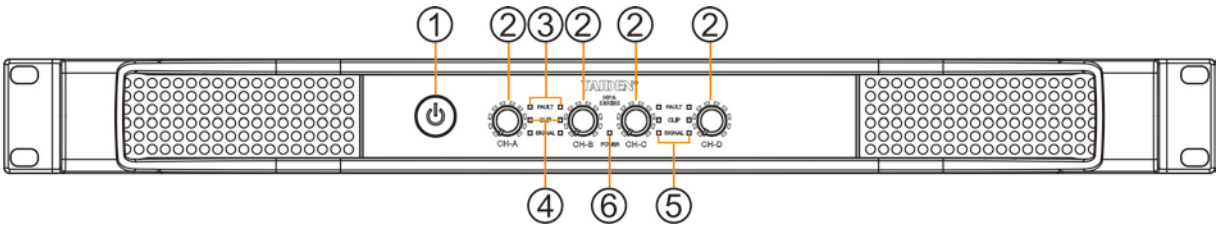
Features:

- Less heat, low working temperature, life span and reliability will be significantly improved.
- Energy saving and environmental protection, saving operating costs.
- Digital power amplifier + switching mode power supply, high efficiency, small size, light weight.
  Output power: 2×200 W (4 Ω/ 6 Ω)
  2×160 W (8 Ω)
  1×400 W (bridge/constant voltage)
  Frequency response: 20 Hz ~ 20 kHz (8 Ω)
  THD: ＜0.04%
- Wide operating voltage range: 100-240 VAC (±10%).
- Three working modes: stereo, mono, bridge.
- 1V and 0.7V gain for selection.
- XLR audio input interface and Speakon audio output interface.
- Perfect protection functions: short circuit, DC, over temperature protection, overload power control, temperature control, etc.
- Low noise high reliable temperature control fan.

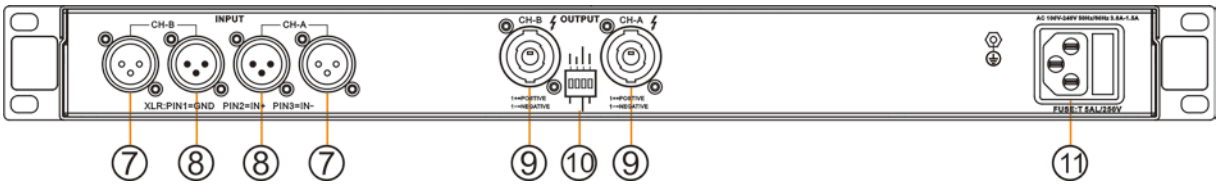
Chapter 2 Functions and indications



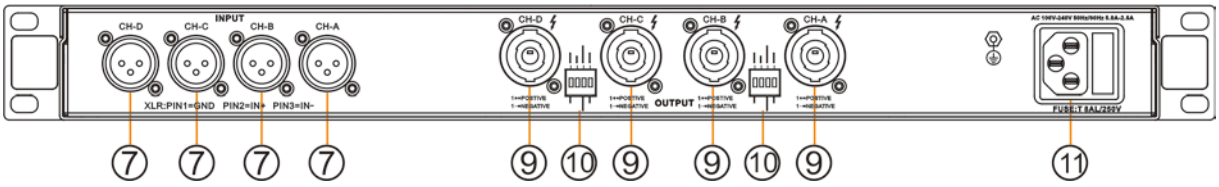
Front panel of HPA-2016/02



Front panel of HPA-2016/04



Rear panel of HPA-2016/02



Rear panel of HPA-2016/04

Figure 2.1 Digital audio power amplifier

1. Power switch

- Power on/off.

2. Gain control

- Gain is controlled by dB attenuation. With the minimum set, the signal is completely cut off.

3. Fault indicator

- When the circuit protection is onset, the indicator turns red.

4. Clip indicator

- When the output signal distortion of the corresponding channel exceeds 1%, the indicator will turn to orange.

5. Signal indicator

- When the input signal exceeds “-32dBV”, the indicator will turn to green.

6. Power indicator

- The "Power" indicator turns to green when power on.

7. Signal input

- Male XLRM socket.

8. Signal input

- Male XLRF socket.

9. Power output

- Four core SPEAKON speaker sockets;
- Stereo / mono mode output: CHA/CHB: 1+, 1-;
- Bridge mode output: CHA/B: 1+, 2-.

10. Mode Switch

- Gain switch:

  When the gain of PA is 1 Vrms, the input sensitivity is 1 Vrms;

  When the gain of PA is 0.7 Vrms, the input sensitivity is 0.7 Vrms;

- Mode switch:

  MONO (DIP switch: MONO): signal inputs from channel A and output from channel A&B; MONO: signal inputs from channel C and output from channel C&D;

  STEREO (DIP switch: STEREO): channel A&B&C&D works independently;

  BRIDGE (DIP switch: MONO): signal inputs from channel A/C and output from channel A/C;

11. Power connector

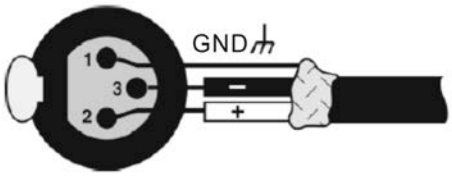
- AC 100-240 V, 50/60 Hz.

Chapter 3 Connection and operation

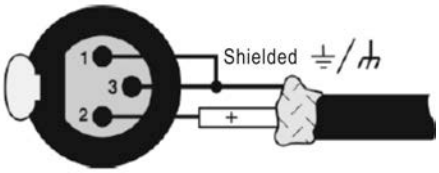
3.1 Input/Output

Connecting knowledge:

- Input wire use the shielded wire with high shielding layer density;
- Input signal use balanced connection, to reduce noise interference;
- If using unbalanced connection, the shorter the better, had better not exceed 3 meters;
- Signal cable should avoid go together with power cable and PA output cable, to avoid noise;
- Please power off all devices before change connection; otherwise it may cause damage to the hearing and speakers.

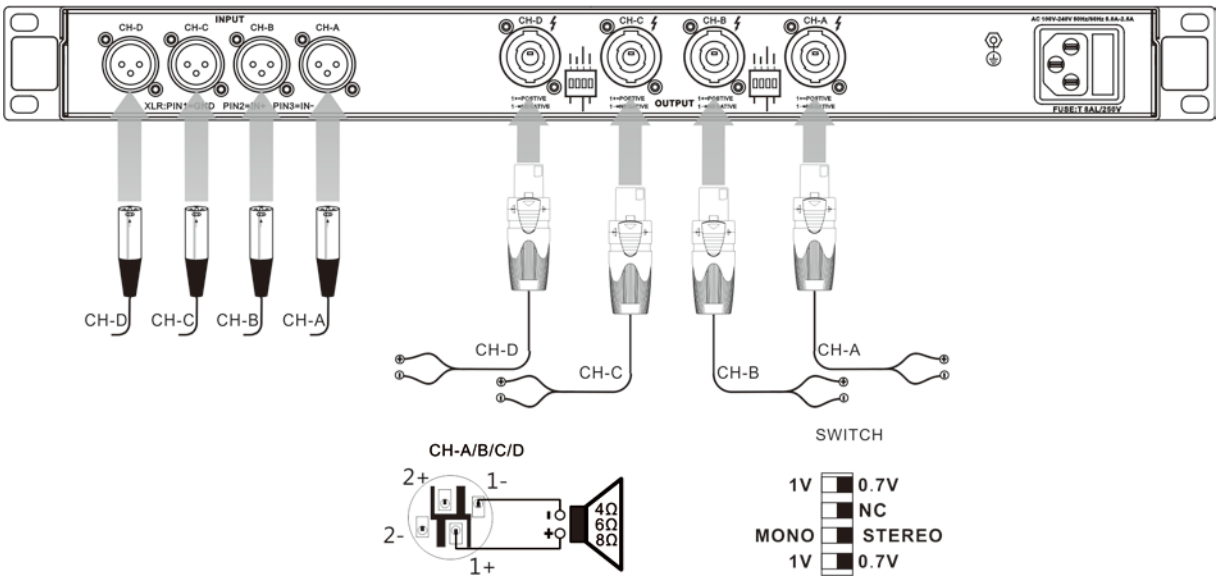


Connection diagram: balanced analog input

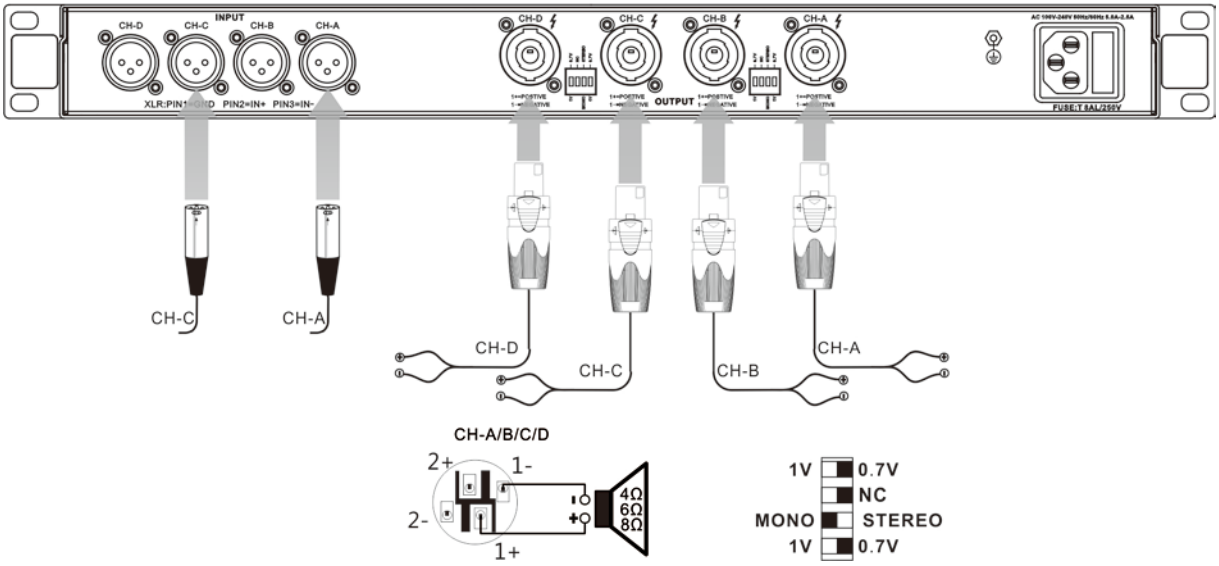


Connection diagram: unbalanced analog input

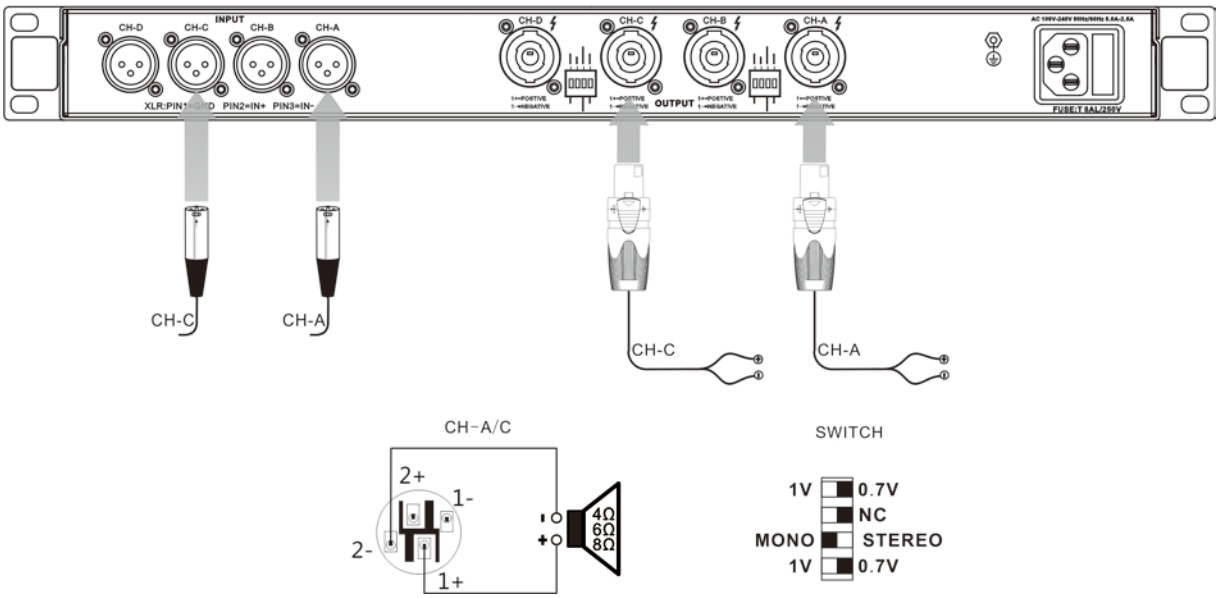
3.2 Stereo mode



3.3 MONO mode



3.4 Bridge mode



Note:

- ☞ In the bridge mode, the DIP switch is set to MONO, the signal is input from the A/C channel, and output from the A/C, and the output terminal is connected to 1+ 2-;
- ☞ The constant voltage output setting is the same as the bridge output setting.

3.5 Operating instructions

Please confirm before installation:

- The power cord not connected to the power socket;
- The power switch is off;
- Volume knob turned off (counterclockwise to limit).

3.5.1 Protect speaker

Clipping not only makes the sound quality worse, but also damages the treble unit (the "Clip" indicator will be turned on when clipping), you can reduce the input signal level to avoid clipping.

The speaker drive circuit may be burned by strong infrasound signal. The sound of breathing and the high level and low frequency signal caused by the dropping of the microphone are typical infrasound signals. To prevent infrasonic signals, one of the following methods should be used:

- Install high pass filter between the mixer output and PA input;
- Open the high pass filter in the mixer. Set the filter frequency as high as possible without affecting the using. For example, set to 35 Hz for music signal and 75 Hz for microphone signal. For each mixer input channel, the filter frequency is set below the minimum fundamental frequency of the related channel.

3.5.2 Matters need attention

Although PA will be protected under exceptional circumstances, please pay attention to the use of PA in order to achieve the best performance and maximum safety:

1. It is necessary to configure PA before use, including the connection of input and output cables, improper wiring will result in equipment failure;
2. Before turning on the power supply of the device, make sure that the volume control knob is adjusted to the minimum. Otherwise, sudden bursts of sound may damage your hearing;
3. Do not connect the ground wire of the output cable and the ground wire of the input signal, which will form ground loop and cause oscillation;
4. Do not connect the output to the power supply, battery or mains supply. Otherwise it may cause an electric shock;
5. Tampering with the circuit or unauthorized modification of the circuit can be dangerous and cause all services provided by the agent fail;
6. Do not use PA when the yellow "Clip" LED blinks continuously;
7. Please do not make mixer overload, otherwise it will send the clipping signal to PA, and PA will precisely reproduce these signals and speakers may be damaged;
8. Do not use PA below the nominal load, too low load may cause PA output protection and premature clipping may damage the speaker;
9. When PA is switched on, the output interface may have a fatal voltage.

   Note: TAIDEN is not responsible for any damage caused by excessive use of other system components.

3.5.3 Heat sinking

Heat sinking method: Cold air intake from front panel vent, flow through the heat sink and take away heat, and discharge from rear panel. In order to have a good heat sinking, please put the device in 0 - 40 °C environment, and make a smooth ventilation between the front and rear panel. Reserved space shall not be less than: side 5 cm, rear 10 cm.

If the temperature of the internal heat sink is more than 70 °C, the power limit function will be activated, and the output power will be reduced to avoid excessive temperature rising. If the temperature of the internal heat sink continues to rise to more than 85 °C, PA will be protected and the output will be turned off. When it drops to a safe temperature, PA will start automatically.

3.6 Troubleshooting

The following table lists the main reasons for the abnormal work and treatment measures, as well as the circuit protection in each case.

Phenomenon	Possible cause	Treatment measures
"Power" indicator is not on when power on	PA is not connected to AC power network	Check AC cable
	The power plug is not inserted into the power socket	Check the power plug and insert it firmly
	Rear panel breaker disconnect	Check the circuit breaker and reset it
	PA power switched off	Check the front panel power switch and place it in the "On" position
"Power" indicator blinks	AC voltage low	Check AC cable
"Fault" indicator on	Short circuit in speaker terminals, PA output terminals or speaker cable	Locate the short circuit and eliminate the short circuit
	PA overload	Supports 4 Ω and above speakers system c
"Clip" indicator on	Input signal is too high	Lower input level
Power off during operation (All indicator off)	PA output DC voltage	Consult your local service center

Chapter 4 Specifications

PA	HPA-2016/02	HPA-2016/04
Rated power (EIAJ THD=1%，1 kHz)	2×200 W (4 Ω / 6 Ω)	4×200 W (4 Ω / 6 Ω)
	2×160 W (8 Ω)	4×160 W (8 Ω)
	1×400 W (Bridge)	2×400 W (Bridge)
	1×400 W (70 V Constant voltage)	2×400 W (70 V Constant voltage)
	1×400 W (100 V Constant voltage)	2×400 W (100 V Constant voltage)
Voltage gain (8 Ω, 1 kHz)	31.0 dB	
Rising slope (1 kHz, Bypass low-pass filter)	50 V/μs	
Input sensitivity (Rated power, 1 kHz)	1 Vrms，0.7 Vrms	
THD+N (10% Rated power, Typical value)	0.04%	
IMD-SMPTE (10% Rated power, Typical value)	0.05%	
DIM30 (10% Rated power, Typical value)	0.05%	
Crosstalk suppression (Below rated power, 20 Hz - 1 kHz)	⩾ 70 dB	
Frequency response (10% Rated output power, 8 Ω, 20 Hz - 20 kHz)	± 0.5 dB	
Input impedance	20 kΩ (Balanced), 10 kΩ (Unbalanced)	
Damping coefficient (8 Ω, 20 Hz - 100 Hz)	⩾ 200	
SNR (A weighted, 20 Hz - 20 kHz)	⩾ 105 dB	
Power supply	100-240 VAC，50/60 Hz	
Protection	Short circuit protection, over temperature protection, DC protection	
Box dimension (h × w × d, mm)	45 × 480 × 295	
Product weight	3.9 kg	4.1 kg

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