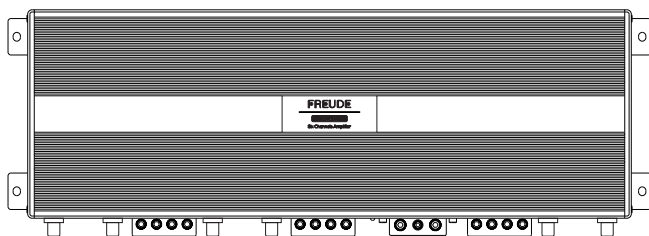


FREUDE

OWNER'S MANUAL

用户手册



FS-6

SIX CHANNELS AMPLIFIER

六通道车载功放

⚠ WARNING / 注意

PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS UNIT!

使用本产品前，请仔细阅读说明书，并保存好说明书，以备查阅！

Introduction

Thank you for purchasing a FREUDE product, designed according to the highest quality standards.

To achieve the best possible performance from your new components, we recommend you follow the instructions in this manual carefully. In order to design and create top level car hi-fi systems you need to understand automobile mechanical and electrical issues very well; if you think you lack the required knowledge or the proper tools, please consult with a specialized installer.

A professional installation will ensure your system delivers all the performance you have paid for, without affecting the safety and reliability of your vehicle.

This manual has been designed to provide you with the basic instructions required to install and use this product. For further information, please contact your authorized FREUDE dealer or after-sales service.

Precautions

- Before making holes, check the mounting space with supplied template.
- To prevent noise keep the wiring away from motors, high-voltage leads and other potential noise sources.
- To prevent a short-circuit, keep all wiring away from moving parts and sharp edges.
- Make sure you carefully read and understand the installation instructions before installing the system in vehicle.

| Packing List

The following items should be placed in the gift box according to the model you purchased. If there is any missing, please inform the seller or manufacturer as soon as possible.

- | | |
|--|---------|
| · FS-6 | · 1 pc |
| · User Manual (English & Simplified Chinese) | · 1 pc |
| · Mounting Bracket | · 4pcs |
| · Screws | · 12pcs |

WARNING

Freude amplifiers can be part of a high power audio system that can generate very high undistorted sound pressure levels. **Please remember that long exposure to an excessively high sound pressure level may damage your hearing.**

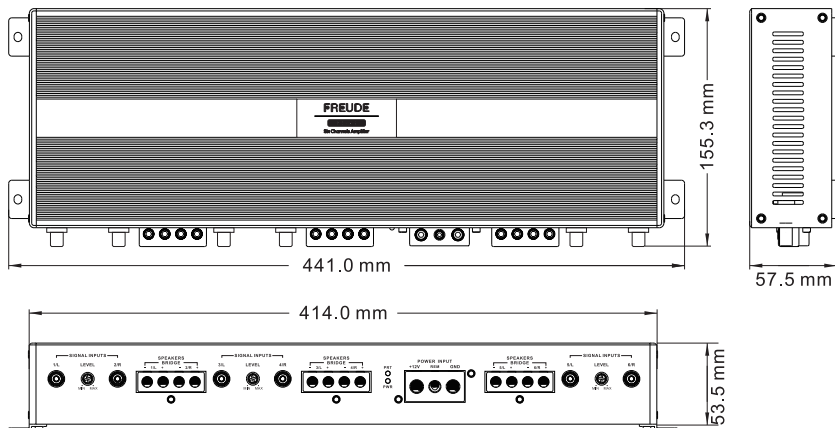
Safety must be at the forefront while driving. The listening volume should never obscure the noise coming from the outside of your vehicle; you should be able to hear the sounds generated by your vehicle in order to promptly face any emergency situation.

Product Specifications

· Model:	· FS-6
· Type:	· Class AB Six Channels Amplifier
· Max. Power @ 4Ω:	· 4Ch x 150W + 2Ch x 210W
· Rms Power @ 4Ω:	· 4Ch x 100W + 2Ch x 140W
· Max. Power @ 2Ω:	· 4Ch x 225W + 2Ch x 270W
· Rms Power @ 2Ω:	· 4Ch x 150W + 2Ch x 180W
· Bridge Rms Power @ 4Ω	· 2Ch x 450W + 1Ch x 540W
· Bridge Max. Power @ 4Ω	· 2Ch x 300W + 1Ch x 360W
· Supply Voltage:	· 9 - 17 VDC
· Frequency Response:	· 10Hz - 60kHz
· Signal Noise Ratio:	· 100dB
· Input Sensitivity:	· 0.4V - 6V
· Input Impedance:	· 22kΩ
· T.H.D.:	· ≤0.05%
· Impedance:	· 2-8Ω
· Fuse:	· 3x40A
· Weight:	· 3.16kg
· Dimensions(LxWxH; mm):	· 414x155.3x53.5mm
· Made in P.R.C	

Product Dimensions

Dimensions in mm



To continuously improve product performance, our company reserves the right to implement technical upgrades without prior notice.
Specifications shown on packaging and user manuals may reflect earlier technical versions.
In the event of any discrepancies in technical parameters or illustrations caused by typesetting or proofreading errors in printed materials,
technical specifications are governed by the physical product.

General Precautions

- Before installing the amplifier, make sure you carefully read and understand all instructions. Disregarding them might cause accidental harms or damage your amplifier.
- The vehicle electric system must have product's required voltage with negative to ground. Make sure your car has it in order to avoid any damages to your amplifier and to the vehicle.
- Pre-plan the configuration of your new amplifier and the best wiring routes to ease installation.
- Always wear protective eyewear when using tools that may generate splinters.
- During installation, keep the amplifier in its packing as long as possible; this will protect it from damages.
- Secure all auxiliary devices you built to install the components to the vehicle structure through brackets, screws, nuts and bolts; this insures stability and safety while driving.
- The amplifier detachment while driving can damage the people in the vehicle and other cars. Secure the amplifier at best, paying utmost attention if installation is inside the passenger's compartment. Do not carry out any installation inside the engine compartment.
- Before installing the amplifier, turn off the source and all other electronic devices in the audio system for preventing any damages.
- Make sure the location you chose for the components does not affect the correct functioning of the vehicle mechanic and electric devices.
- Do not run the cables or install the amplifier next to electronic gear cases.
- Use extreme caution when cutting or drilling the car plate, checking there are no electrical wiring or structural element underneath.
- Make sure power cable is not short circuited during installation and connection.
- Power cable must have mechanically resistant and self-extinguishing insulation. Its section have a size corresponding with what is suggested in this manual. Avoid to run it over or through sharp edges or close to moving mechanical devices. Make sure it is well fixed all along its length. Block positive and negative cables just close to the amplifier respective power supply terminal blocks through screw.
- Use rubber grommets to protect the wire if it runs in a hole of the plate or proper materials if it is close to heat-generating parts.
- To ground the device (-) in the right way, use a screw in the vehicle chassis; scrape all paint or grease from the metal if necessary, checking with a tester that there is continuity between the battery negative terminal (-) and the fixing point. If possible, connect all components to the same ground point; this solution rejects most noise.
- Route all signal cables away from power cables.
- Never run cables outside the vehicle; you would not be protected against wear and in case of accidents.
- When installing speakers and the cables that connect them, make sure that non-insulated parts never touch, even occasionally, the vehicle cutting parts. If they do, the amplifier protection is activated.
- To prevent all problems, use good quality cables, connectors and accessories.
- After installation and before plugging the main power supply fuse, check the system wiring and make sure all connections were done in the right way.
- Power amplifiers put an increased load on the battery and on its charging system. We recommend checking your alternator and battery condition to ensure they can handle the increased consumption. Standard electrical systems in good condition should be able to stand this extra load without problems but we recommend the use of an energy storage capacitor and/or a battery for high level audio systems.

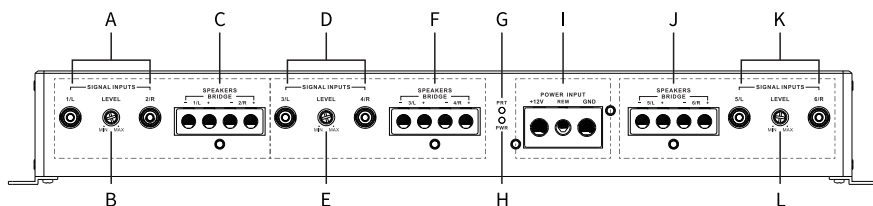
- Put a fuse and its insulated fuse holder 40 cm max. far from the battery positive terminal; connect one end of the power cable to it after connecting the other end to the amplifier. The fuse value must be 50% higher than the amplifier built-in one. In case the cable supplies several amplifiers, the fuse value will have to be 50% higher than the sum of the values of all other fuses in the amplifiers.
- There must be good air circulation where the amplifier is installed; this area must not be affected by humidity, rain, external deposits or parts coming from the vehicle mechanical devices. Do not hinder in any way the cooling of the amplifier side fins
- Install the amplifier in the vehicle parts where temperature is between 0°C (32°F) and 55°C (131°F).

WARNING: When working in demanding conditions, the amplifier can reach temperatures of around 80 - 90°C (176 - 194°F). Make sure it is not dangerously hot before touching it.

| Precautions

- This unit is designed for negative ground 12V DC operation only.
- Use subwoofer speakers system with an impedance of 2 or 8 Ohms.
- Avoid installing the unit where:
 - It would be subject to high temperatures, such as from direct sunlight or hot air from the heater.
 - It would be exposed to rain or moisture.
 - It would be subject to dust or dirt.
- If your car is parked in direct sunlight and there is a considerable rise in temperature inside the car, allow the unit to cool off before operation.
- When installing the unit horizontally, be sure not to cover the heatsink fins with the floor carpet.
- If this unit is placed too close to the car radio, an interference may occur. In this case, separate the amplifier from the car radio.
- This power amplifier employs a protection circuit to protect the amplifier and speakers if the amplifier malfunctions. Do not attempt to test the protection circuits by covering the heatsink or connecting improper loads.
- Do not use the unit with a weak auto battery as its optimum performance depends on a normal battery supply voltage.
- For safety reasons, keep the volume of your car audio system moderate so that you can still hear normal traffic sounds outside your car.
- If the product contains desiccant, do not eat, avoid touching the liquid, and keep away from children.

Functions



A. Ch1 & Ch2 RCA Input Terminal

B. Ch1 & Ch2 Volume Level

C. Ch1 & Ch2 Speaker Outputs Terminal

D. Ch3 & Ch4 RCA Input Terminal

E. Ch3 & Ch4 Volume Level

F. Ch3 & Ch4 Speaker Outputs Terminal

G. Protection Light

H. Power Light

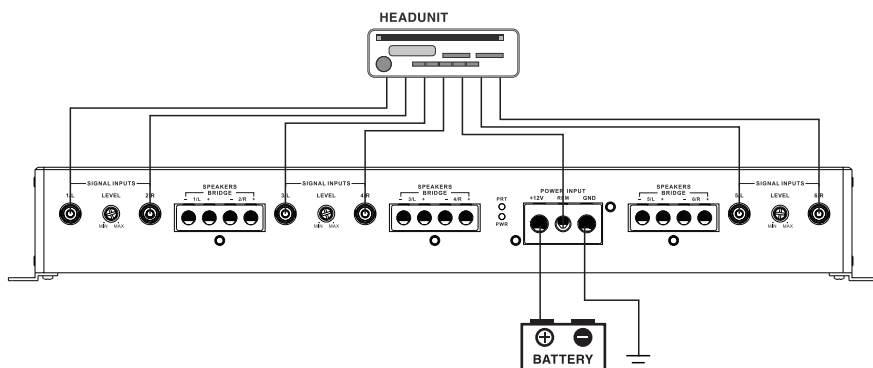
I. Power Input Terminal

J. Ch5 & Ch6 RCA Input Terminal

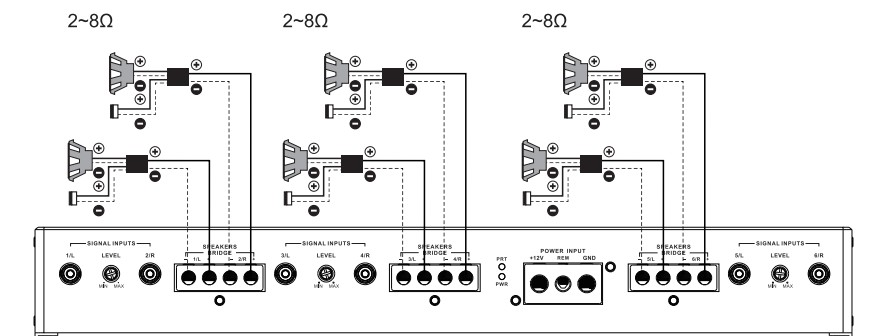
K. Ch5 & Ch6 Volume Level

L. Ch5 & Ch6 Speaker Outputs Terminal

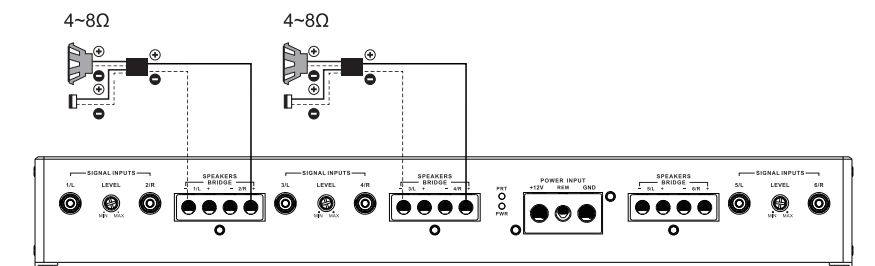
Speakers Connections



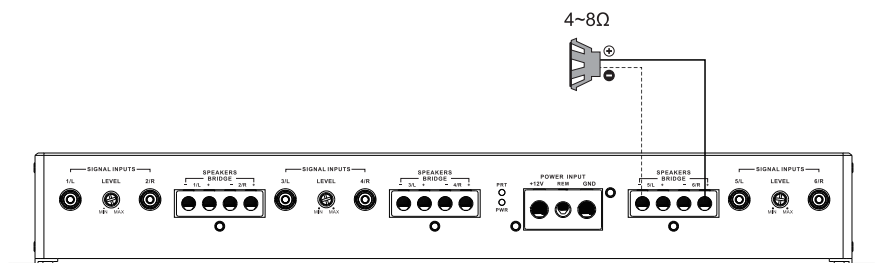
Speaker Connection



Speaker Bridge Connection



Single Subwoofer Connection



| Interference

All cables are sources of interference. The power cable and RCA audio cable are very prone to interference: the remote cables are less prone. There is often interference caused by the generator(piping), ignition (cracking) or other car electronic parts. Most of these problems can be eliminated by correct and careful cabling. In doing so, these are the following guidelines:

- . Use only a signal cable for the wiring between "low level in" of the amplifier and RCA or DIN output of the radio.
- . Lay the signal, speaker and power cables separately with enough distance form one another and also from each other car cable. If not possible, you can lay the circuit and ground cable together with the serial cables. Audio and speaker cable should be as far away from these as possible. The REM cable to the automatic antenna output of the radio can be laid together with the signal cables.
- . If there are noises from the car electronics. Add an interference suppression choke to the power wiring.
- . If there are humming noises, use thicker ground cables or add further ground cables to the chassis

| Wiring Instructions

POWER CONNECTION

The battery terminal (+12V) must be connected to the fuse block before connecting to the positive terminal of the vehicle battery to provide an adequate voltage source and minimize noise. Use only #10 gauge or thicker (smaller gauge #) wire for this lead and connect it to the terminal of the battery after all other wiring is completed.

GROUND CONNECTION

The ground terminal (GND) connection is also critical to the correct operation of the amplifier. Use a wire of the same gauge as the power connection (#10 or thicker) and connect it between the ground terminal(GND) of the amplifier and a metal part of the vehicle close to the mounting location. This wire should be as short as possible and any paint or rust at the grounding point should be scraped away to provide a clean metal surface to which the end of the ground wire can be bolted.

REMOTE TURN-ON CONNECTION

The amplifier is turned on by applying +12V to the remote turn-on terminal (REM). The Wire lead to this terminal should be connected to the "Auto-Antenna" lead from the car stereo which will provide the +12V only when the car stereo is turned on. If the car stereo does not provide an Auto-Antenna lead, the remote turn-on lead may be wired to an "Accessory" or "Radio" terminal in the car's fuse block. This will turn the amplifier on and off with the ignition key, regardless of whether the car stereo is on or off. The remote turn-on lead does not carry large currents. So #20 gauge wire may be used for this application.

SPEAKER CONNECTIONS

Depending on the type and number of speakers used with the amplifier, wire them to the speaker terminals as per the appropriate wiring diagram. For most applications #16 gauge wire should be used for the speaker leads but in no case thinner than #18 gauge. For leads in excess of 3 meters #14 gauge is recommended. When wiring the speakers, pay careful attention to the polarity of the terminals on the speakers and make certain they correspond to the polarity of the corresponding terminals on the amplifier. Do not ground any speaker leads to the chassis of the vehicle.

产品简介

感谢您购买根据高质量标准设计的FREUDE产品。

为了使设备发挥最佳性能，我们建议您仔细遵循本手册中的说明。为了设计和创建顶级的汽车高保真系统，您需要非常了解汽车的机械和电气问题；如果您认为您缺乏所需的知识或适当的工具，请咨询专业安装人员。

本手册旨在为您提供安装和使用本产品所需的基本指导。如需获取更多信息，请联系FREUDE授权经销商或FREUDE服务中心。

注意事项

- 在安装钻孔之前，请检查安装的空间和使用安装模板。
- 为了防止噪音的增加，应使连接线远离发动机，高压引线和其他潜在的噪声源。
- 为了防止短路，把所有的连接线都远离边缘锋利的部件。
- 在您的车里安装这个音响系统之前，确保您仔细阅读和理解安装说明。

包装清单

根据您购买的型号包装箱内应放置如下物件，如有缺少，请尽快通知销售商或厂家：

- | | |
|----------|-------|
| · FS-6 | · 1台 |
| · 中英文说明书 | · 1本 |
| · 安装支架 | · 4个 |
| · 螺丝 | · 12个 |

注意事项

FREUDE 放大器是大功率音频系统的一部分，会产生很高的不失真的声压级。请记住，长期暴露在过高的声压下可能会损害你的听力；因此，请用常识实际操作安全音量。

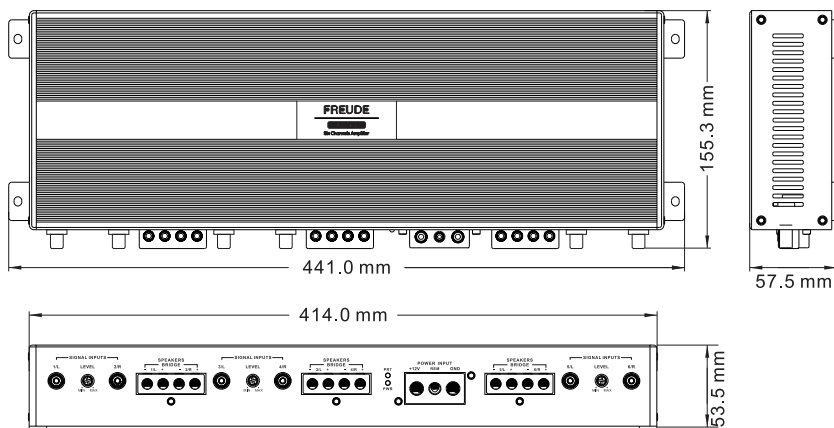
开车时听的音量不能掩盖车辆外部的噪音；你应该能够听到你的车辆产生的声音，以便及时面对任何紧急情况。

产品规格

· 型号:	· FS-6
· 类型:	· 六声道AB类功放
· 峰值功率 @ 4Ω:	· 4Ch x 150W + 2Ch x 210W
· 额定功率 @ 4Ω:	· 4Ch x 100W + 2Ch x 140W
· 峰值功率 @ 2Ω:	· 4Ch x 225W + 2Ch x 270W
· 额定功率 @ 2Ω:	· 4Ch x 150W + 2Ch x 180W
· 桥接峰值功率 @ 4Ω:	· 2Ch x 450W + 1Ch x 540W
· 桥接额定功率 @ 4Ω:	· 2Ch x 300W + 1Ch x 360W
· 电源电压:	· 9 - 17 VDC
· 频率响应:	· 10Hz - 60kHz
· 信噪比:	· 100dB
· 输入灵敏度:	· 0.4V - 6V
· 输入阻抗:	· 22kΩ
· 失真度:	· ≤0.05%
· 扬声器阻抗:	· 2-8Ω
· 保险丝:	· 3x40A
· 重量:	· 3.16kg
· 产品尺寸(长x宽x高; mm):	· 414 x 155.3 x 53.5 mm
· 中国制造	

产品尺寸

尺寸单位:mm



通用预防措施

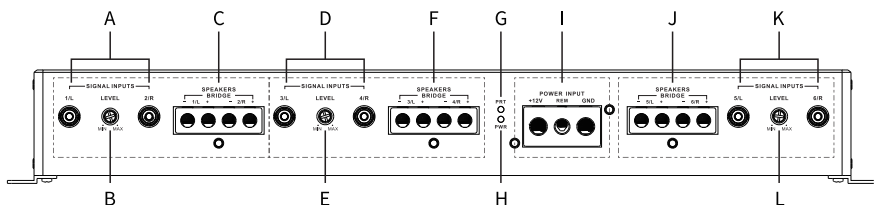
- 在安装功放之前,一定要仔细阅读和理解所有的使用说明。忽略它们可能会造成意外伤害或损坏放大器。
- 确保你的车辆电动系统必须有合乎参数要求的直流电压,负接地,以避免对你的放大器和车辆造成任何损害。
- 预先规划新放大器的配置和最佳布线路线,以方便安装。
- 使用可能产生碎片的工具时,一定要戴防护眼镜。
- 在安装过程中,将放大器尽可能长时间地保存在其包装中,这将保护它不受损害。
- 通过支架、螺钉、螺母和螺栓将安装组件的所有辅助装置固定在车辆结构上,以保证驾驶时的稳定性和安全性。
- 驾驶时放大器脱落,会对车内人员和其他车辆造成伤害。请将放大器固定好,如果安装在乘客车厢内,请格外注意。不要在发动机舱内进行任何安装。
- 在安装放大器之前,关闭主机和音频系统中的所有其他电子设备,以防止任何损坏。
- 确保您选择的安装位置不影响车辆机械和电气设备的正确功能。
- 不要将电缆或将放大器安装在变速箱旁边。
- 切割或钻孔时要特别小心,检查下面是否有电线或结构器件。
- 安装、连接时,确保电源线不短路。
- 必须使用绝缘良好和优质耐用的电力电缆。它的规格与本手册中建议的相对应。避免碾过或穿过锋利的边缘或靠近移动的机械设备。确保它的整个长度都是固定好的。通过紧固件将正负极电缆紧靠放大器各自的电源端子座。
- 如果电线要穿过板的孔,使用橡胶垫圈来保护它;如果电线靠近发热部件,使用适当的材料。
- 用正确的方式将设备(-)接地,请使用车辆底盘上的螺钉;如果有必要,刮去金属上所有的油漆或油脂,用测试仪检查电池负极(-)和固定点之间是否相通。如果可能,将所有组件连接到同一个接地点;这种方法可以排除大部分噪音。
- 所有信号线应远离电源线。
- 不要在车外安装电缆;以防止磨损和造成事故。
- 在安装扬声器和连接它们的电缆时,确保非绝缘部件永远不会接触到车辆切割部件,否则,放大器保护被激活。
- 为了防止所有问题,请选用正规优质的电缆、连接器和附件。
- 安装结束后,在插入主电源保险丝之前,检查系统接线,确保所有连接都正确。
- 功率放大器增加了电池和充电系统的负载。我们建议检查您的交流发电机和电池的状况,以确保它们可以处理增加的消耗。处于良好状态的标准电气系统应该能够正常地承受这种额外的负载,但对于大功率输出音频系统,我们建议使用储能电容和/或电池。
- 保险丝及其绝缘保险丝座连接电池正极的电源线长度最多放置 40 厘米。并远离电池正极;将电源线的另一端连接到保险丝后,再将电源线的一端连接到放大器上。保险丝的值必须比放大器内置的高 50%。如果电缆提供几个放大器,保险丝的值将必须比功放中所有其他保险丝值的总和高 50%。
- 安装放大器的地方必须有良好的空气流通;这个区域不能受潮湿、雨水、外部沉积物或来自车辆机械设备的部件的影响。不要以任何方式阻碍放大器散热翅的冷却。
- 将放大器安装在温度介于 0°C(32°F)至 55°C(131°F)之间的车辆部件中。

警告: 当工作在苛刻的条件下,放大器可以达到温度约 80 - 90°C (176 - 194°F)。在接触它之前,确保它不会引起烫伤。

警告

- 本机器设计仅适用于负极接地12伏特直流下操作。
- 可接2欧到8欧的扬声器系统。
- 避免安装在以下环境中：
 - 高温日照或有热气流动的地方
 - 暴露在雨水或潮湿的地方
 - 多尘或有污垢的地方
- 如果汽车停留在太阳直接照射的地方，车内温度会上升，在使用前请先待机器冷却。
- 如果本机器是水平安装在汽车底盘上，请确保地毯不会盖住散热器。
- 如果本机器太靠近汽车收音机，可能会引起干扰。这时请把功放机和汽车收音机分开摆放。
- 本机器内置保护电路，在功放机功能出错时对功放和喇叭起保护作用。请不要冒险将功放机用物件盖住或接不合适的负载以测试这个保护电路。
- 请不要使用过弱的电池，因为本机器的优越性能取决于它有正常的电池供应电压。
- 出于安全考虑，请保持汽车音响系统音量在一个适合的水平，以便您能够听到车外一般的声音。
- 产品如果含有干燥剂，请勿食用，避免触碰液体，并远离儿童。

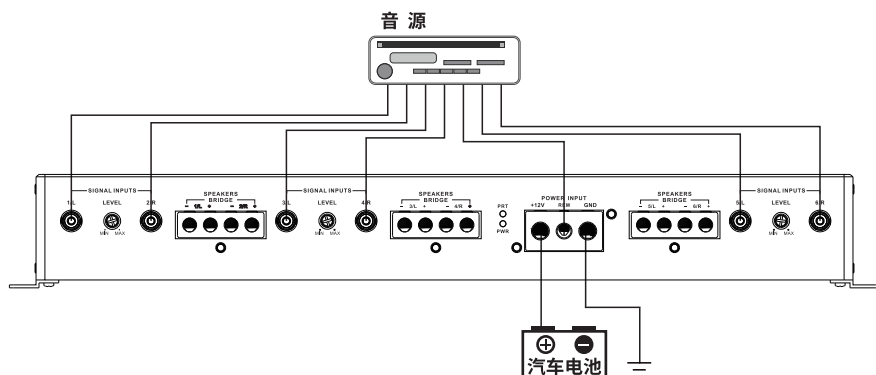
功能说明



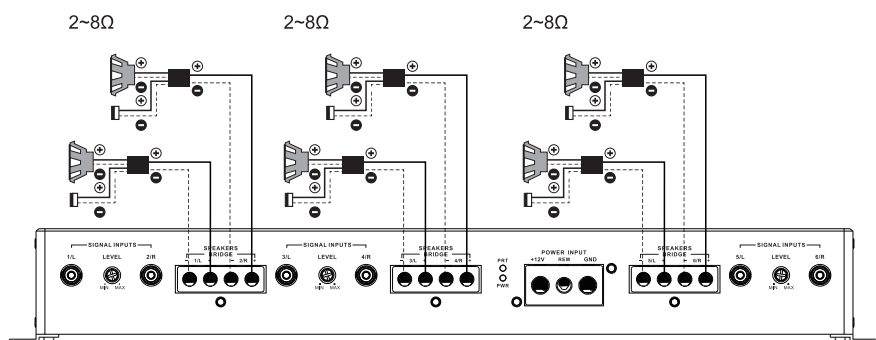
- A. Ch1 & Ch2 RCA 输入端子
- B. Ch1 & Ch2 电平调节
- C. Ch1 & Ch2 扬声器输出端子
- D. Ch3 & Ch4 RCA 输入端子
- E. Ch3 & Ch4 电平调节
- F. Ch3 & Ch4 扬声器输出端子

- G. 保护指示灯
- H. 电源指示灯
- I. 电源输入端子
- J. Ch5 & Ch6 RCA 输入端子
- K. Ch5 & Ch6 电平调节
- L. Ch5 & Ch6 扬声器输出端子

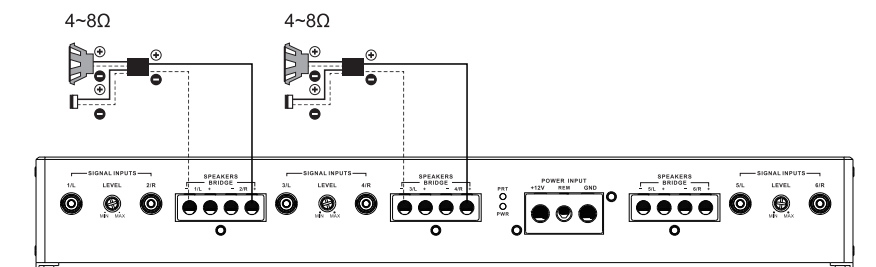
电源连接



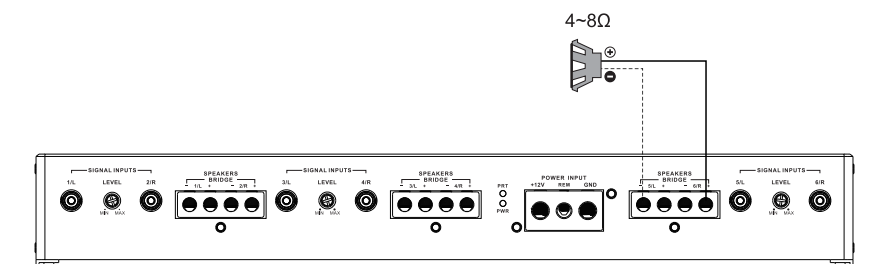
扬声器连接



扬声器桥接输出



单个低音扬声器



关于信号干扰的提醒

所有电缆都是干扰源，电源线和 RCA 信号线都非常容易引起干扰，线控线材产生的干扰相对较小。发动机噪音，点火器爆裂声或其他汽车部件也常常会引起干扰。大多数的这些问题都能够通过正确且谨慎的接线方式来避免。安装过程中，请参照以下指引：

- 连接主机的 RCA 输出到功放机的低电平输入信号时，仅可使用音源信号线。
- 远离车内其他线材，信号线，喇叭线和电源线之间也需隔开一定距离。若不可行，也可将电源线和地线与串行电线一起放置。音频线和喇叭线应尽量远离这些线材。连接到收音机输出天线的线控线材可以和信号线放置在一起。
- 如果汽车电子设备有噪音干扰，请在电源上添加抑制干扰电感。
- 如果有嗡嗡声噪音，请使用更粗的接地线，或者添加更多的接地线到汽车底盘上。

接线说明

电源接线电池

+12V 正极必须通过保险丝座连接到汽车电池的正极，以为其提供足够的电压且噪音最小。请只使用 10 号或更粗（号数更低）的线材，当所有接线完成后才将线材接到电池的端子上。

地线连接

地线连接对于功放机的正常工作同样非常关键。请使用同电源线一样大小的线材（10 号或更粗的），将它连接在功放地线和靠近功放机的汽车金属部位之间。这条线要尽可能短，如果接地点有任何油漆或铁锈，请把它刮去，为接地提供一个干净的金属接触面，地线的末端可用螺栓固定。

线控开机连接

功放机通过线控端子接收到+12 伏特电压时自动开启，可以用汽车主机里的“自动天线”。如果汽车主机没有提供“自动天线”引线，线控开机线可以连到汽车保险盒中的“配件”或“收音”处。这样不管汽车主机是开或关，都可以通过打火器钥匙开启功放。线控开机线不需要承载大电流，所以这里用 20 号线就可以了。

喇叭连接

这取决于要连到这台功放机上的扬声器的数量和种类，根据接线图把喇叭端子接起来。大多数情况下，可以用 16 号线，但是无论如何不能使用比 18 号线更细的线材。对于超过 3 米的引线，建议使用 14 号线。在连接喇叭端子的时候，请留意端子的极性，确保它们被接到功放机对应的极性端子上。不要将喇叭线对接汽车底板地线。

FREUDE

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