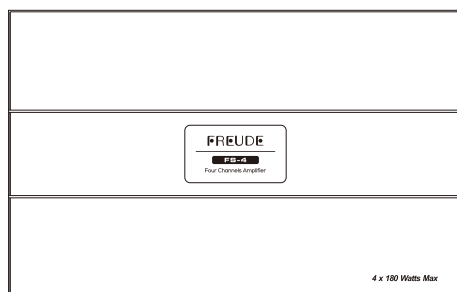


FREUDE

OWNER'S MANUAL



FS-4

4 CHANNELS AMPLIFIER

WARNING

PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS UNIT!

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

- This unit is designed for negative ground 12V DC operation only.
- Use speakers with an impedance of 2 or 4 Ohms (4 to 8 Ohm when used as bridging amplifier)
- 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 transistors 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.

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-4 Amplifier | · 1 pc |
| · User Manual (English) | · 1 pc |
| · User Manual (Simplified Chinese) | · 1 pc |
| · Mounting Bracket | · 4pcs |
| · Self Tapping Cross Screws | · 4pcs |
| · Cross Countersunk Head Screws | · 8pcs |

WARNING

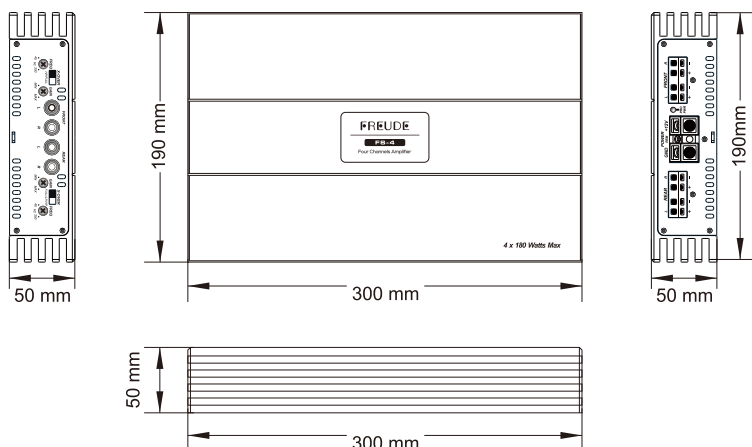
Freude amplifiers can be part of a high power audio system that can generate very high undistorted sound pressure levels. **Please remember that long exposure to an excessively high sound pressure level may damage your hearing.**

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:	· Class AB Four Channels Amplifier
· Channels:	· 4/3/2
· Rms Power @ 4Ω:	· 90W x 4Ch
· Max. Power @ 4Ω:	· 180W x 4Ch
· Rms Power @ 2Ω:	· 120W x 4Ch
· Max. Power @ 2Ω:	· 240W x 4Ch
· Bridge Rms Power @ 4Ω	· 240W x 2Ch
· Bridge Max. Power @ 4Ω	· 480W x 2Ch
· Supply Voltage:	· 10 - 16 VDC
· Frequency Response:	· 10Hz - 60kHz
· Signal Noise Ratio:	· 93dB
· Input Sensitivity:	· 250mV - 4V
· Input Impedance:	· 22kΩ
· T.H.D.:	· <0.02%
· Hi Pass Frequency:	· 40Hz - 250Hz
· Low Pass Frequency:	· 40Hz - 250Hz
· Weight:	· 3.24kg
· Dimensions(LxWxH; mm):	· 300 x 190 x 50 mm

Product Dimensions



The contents of this manual and the specifications of this product are subject to change without notice. SICHERHEIT reserves the right to make changes to the specifications and materials contained therein without notice.

General Precautions

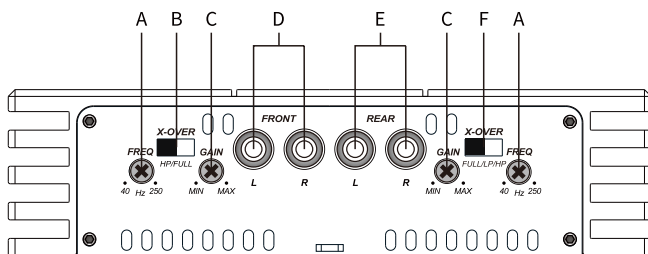
- Before installing the amplifier, make sure you carefully read and understand all instructions. Disregarding them might cause accidental harms or damage your amplifier.
- The vehicle electric system must have 12V DC voltage with negative to ground. Make sure your car has it in order to avoid any damages 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.

Functions

Front Panel



A. FREQ control

B. Frequency Selector

Switch: HP/FULL

C. Gain Control

D. Front Sound Field

RCA Input Terminal

E. Rear Sound Field

RCA Input Terminal

F. Frequency Selector

Switch: FULL/LP/HP

G. Rear Sound Field

Speaker Output Terminal

H. Power Input Terminal

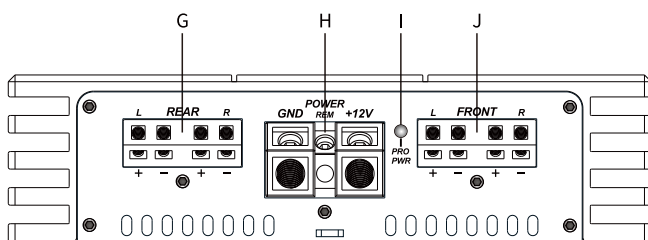
I. LED Power and Protection

Indicator

J. Front Sound Field

Speaker Output Terminal

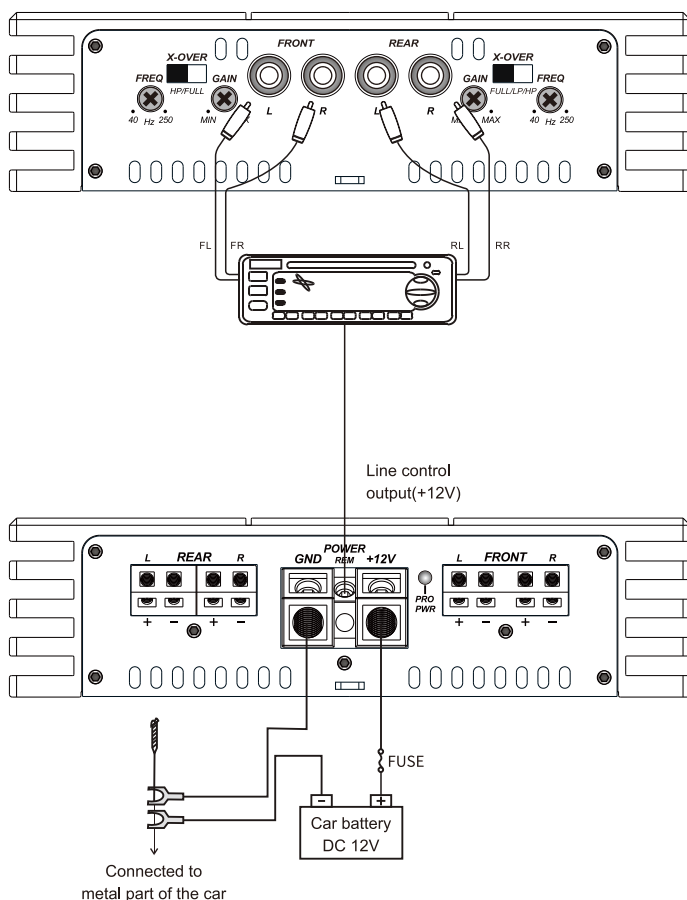
Rear Panel



Connections

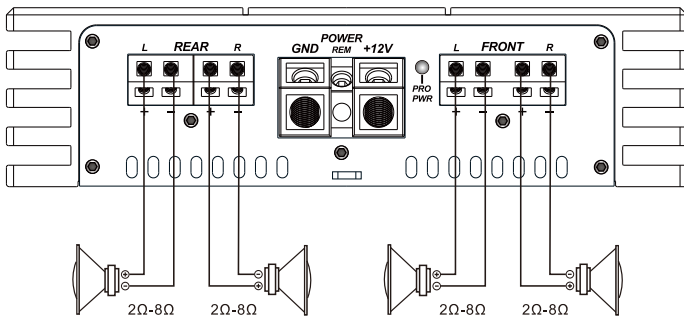
REM = Connect the remote wire (power antenna output) from the head unit to the REM terminal. If the head unit is not equipped with a remote/antenna output, locate a wire that is controlled by the accessory position of the key. It is important to have the amplifier turn off with the radio or key. If the amplifier remains on, the battery will drain.

12V = Connect the proper gauge power wire to the +12V terminal. Trace the power wire through the car to the in-line fuse or circuit breaker that is no more than 40cm from the battery. Remember, the in-line fuse or circuit breaker protects the car in the event of short circuit, Connect the in-line fuse or circuit breaker to the battery.

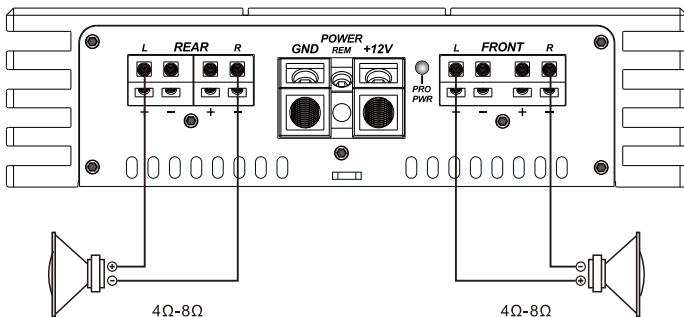


| Speaker Out Connections

4 Channels Speaker Connection Stereo Mode



2 Channels Speaker Connection Bridged Mode



| 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.



SICHERHEIT (ASIA) CO., LIMITED
Address: Flat/rm 815 8/f Star House 3 Salisbury Road
Tsim Sha Tsui, Kowloon, Hong Kong

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