FREUDE

OWNER'S MANUAL

CAR AUDIO SYSTEM

PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS UNIT

FM-1

WARNING

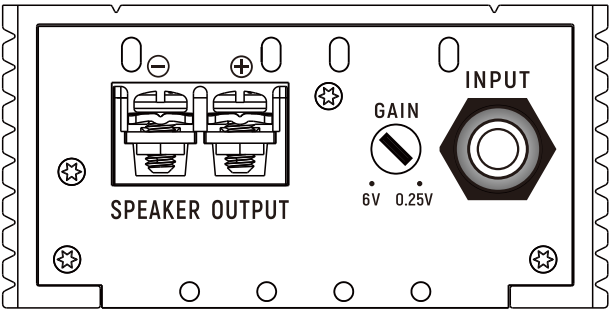
Make sure you choose a suitable place to mount the unit. The position should be completely dry with a good circulation of air, and from a mechanical point of view very stable.

SPECIFICATION EN

FREUDE MONO CHANNEL AMPLIFIER			
POWER DESCRIPTION	FM-1	Signal Noise Ratio	96dB
Rated Power @ 2 Ohm	80Wx1	Input Sensitivity	250mV-6V
Peak Power @ 2 Ohm	160Wx1	T.H.D.	<0.02%
Rated Power @ 4 Ohm	60Wx1	Supply Voltage	10~16V DC
Peak Power @ 4 Ohm	120Wx1	Input Impedance	22K Ohm
Frequency Response	10Hz-70KHz (-3dB)	Dimensions(mm)	188x80x40

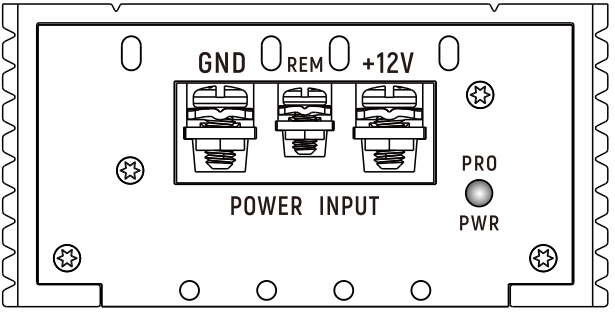
FUNCTIONS EN

FRONT PANEL



GAIN CONTROL

REAR PANEL



GND(-)=GROUND CONNECTION

Connect the GND terminal to the chassis ground of your car and take care of best electric and mechanic contact.In doing so,drill a hole in to the car chassis near the amplifier then remove paint,dirt or any other substance from the ground point.After that fasten the cable end with added ring terminal by using a screw.Ensure that the ground connection is as short as possible,and the cable diameter is minimum above model 8(AWG).

+12V=POWER SUPPLY

Connect the +12V terminal to the positive pole of the battery with a lead cable and add a fuse in to the power cable in a distance of not more then 30cm from the battery.3 meters of the cable wire to the minimum number 8(AWG) and 6 meters of the cable wire to the minimum number 6(AWG).

REM(ON/OFF)REMOTE CONTROL

Connect the REM terminal to the automatic antenna connector of your car radio.NOW when turning on and off your car radio.The amplifier automatically switches ON and OFF.A cable diameter of model number 23(AWG) is sufficient.

FUSE

The amplifier is equipped with a plug-in auto fuse protecting the set against fault conditions. Do not use a fuse with a higher value and never bridge the fuse over, as this may lead to irreparability damage so that ant any claim for warranty is denied.

TROUBLE SHOOTING

No Function:

The connection cable is not connected correctly (= terminal CABLE/GND/REM). Ensure that all connections and mechanic contact and that the jacket has been removed. The fuse is defective-pay attention to the correct value of a new fuse !

No Sound:

Speaker cable or speaker plug are not connected correctly.
No Sound /Red LED Protection Shines:
The plus and minus wires of the speaker cable have contact, thus eliminate the short circuit. If you use a 2 Ohm speaker or a 4 Ohm speaker and the set is overloaded, then turn the gain control to"Min" until the operation is free of trouble.

Poor Sound Quality (Distortions):

The speakers are overloaded, therefore turn down the volume level and check the volume control positions.

PRECAUTIONS EN

- This unit is designed for negative ground 12V DC operation only.
- 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.
- If the product contains desiccant,do not eat,avoid touching the liquid,and keep away from children.

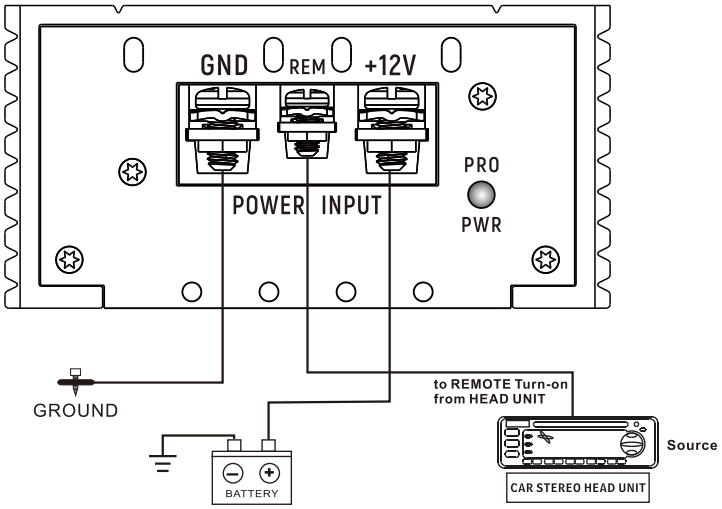
FUSE REPLACEMENT

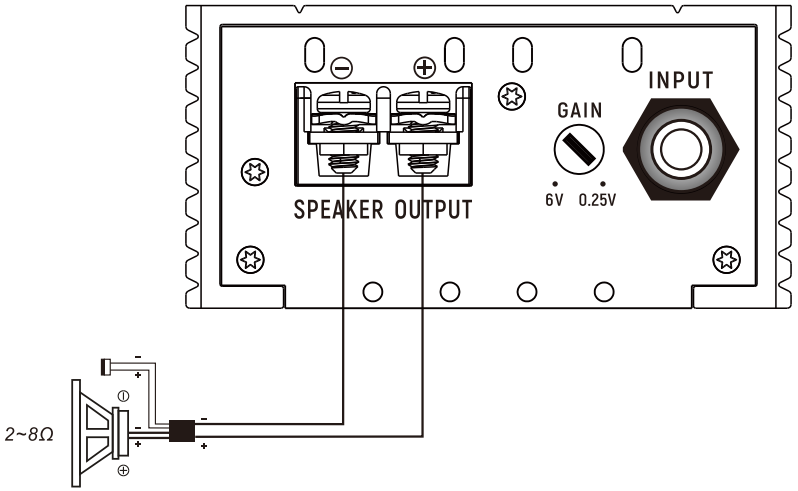
If the fuse blows, check the power connection and replace the f use. If the fuse blows again after replacement, there may be an internal malfunction. In this case, consult your dealer.

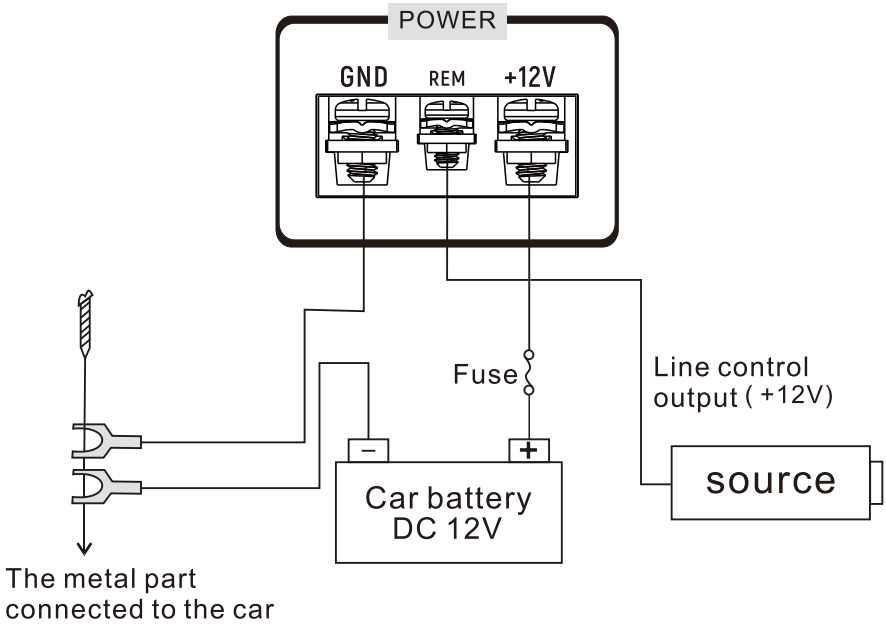
WARNING:
Use the specified amperage fuse. Use of a higher amperage fuse may cause serious damage.

PROTECTION CIRCUIT:
This amplifier is provided with a protection circuit which operates in the following cases when:

- the unit is overheated.
- the speaker terminals are short circuited.


GND
REM
+12V
POWER INPUT
PRO
PWR
GROUND
to REMOTE Turn-on
from HEAD UNIT
Source
BATTERY
CAR STEREO HEAD UNIT


INPUT
GAIN
6V 0.25V
SPEAKER OUTPUT
2~8Ω



NOTES ON THE POWER SUPPLY:

- Connect the +12V power input lead only after all other leads have been connected.
- Be sure to connect the ground wire of the unit securely to a metal part of the car A lose connection may cause a malfunction of the amplifier.
- REM:The unit is turned on by applying +12 Volts to this terminal. This terminal does not draw heavy current like the Power Terminals so a thinner connecting wire is acceptable. Standard 25 GAUGE is fine . if the radio is equipped with a Power Antenna control wire,it can drive this terminal.if the Power Antenna wire is already in use,you can still splice into it.With this method,the unit will turn on automatically with the radio.
- Use a 10 or thicker power cord.
- Place the fuse in the power supply lead as close as possible to the car battery .
- During a full power operation, maximum current will run through the system Therefore, make sure that the leads to be connected to the +12V and GND terminals of the unit respectively must be larger than 10-Gauge (AWG.10).

POWER CONNECTION

The battery terminal (+12V) must be connected directly to the positive terminal of the vehicle battery to provide an adequate voltage source and minimize noise. Connecting the battery terminal lead to any other point (such as the fuse block) will reduce the power output and may cause noise and distortion. 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 #18gauge wire should be used for the speaker leads but in no case thinner than #20 gauge. For leads in excess of 3 metters #16 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.

INPUT CONNECTIONS

This amplifier features low-level input capability.

If the car stereo does not provide low-level outputs,the power amplifier can be connected to the power amplifier by adding a high and low level converter.

OPERATION EN

After the amplifier has been installed and all connections have been made careful -lyand securely, turn the radio on so that the amplifier is switched on automatically. After a short power-on period, the amplifier reaches its full performance.

Now turn up the volume slowly using the volume control of the radio. If there is no sound or only a distorted replay, switch off the radio immediately, the amplifier will also switch off automatically, and check if all connections have been made correctly.

- **POWER=LED POWER INDICATOR**

  After the orderly connection of the three power terminals, the LED indicator shines green and goes out with off.

- **PROTECT =LED PROTECTION INDICATOR**

  This set is equipped with an overload protection, immediately upon overloading due to short circuit or much increased temperature the overload protection is activated and the red LED indicator is shining. Through this the amplifier is protected against damage. In case of the thermal protection a certain short cooling time must be allowed after which the amplifier automatically resumes operation.

- **LEVEL CONTROL**

  The input level control allows the system to work well within a wide range of output level. Choose the adjustment in the way that you achieve a sound most possibly without any distortion. as a guideline the following procedure is recommended:

  If you use several amplifier, the adjustment has to be made for each set separately, tune up the volume of your car radio to 2/3 of the maximum volume.

  Now turn the gain control of the amplifier from " Min " to " Max " direction until you can hear distortions. Then turn the level control a little back to " Min ". The gain control adjustment is finished now.

  Attention! If you use 2 Ohm speakers or 4 Ohm speakers and the overload protection is triggered, turn the gain control to " Min " direction, until the operation is free of trouble.

INTERFERENCE EN

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 source cable for the wiring between " low level in " of the amplifier and RCA output of the radio .
- Lay the signal, speaker and power cables separately with enough distance from 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 huming noises, use thicker ground cables or add further ground cables to the chassis.

FREUDE

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