



DSP-360

Digital Audio Processor



OWNER'S MANUAL



Dear customers:

Thank you for choosing this product! In order to ensure the safety of you and the machine, and to allow you to fully enjoy the best sound effects, please read this manual carefully before connecting or operating the unit. Please keep this manual in a safe place for future reference after reading.

open box to check:

After unpacking, please confirm whether the machine is damaged due to transportation, and wire and test each function according to the requirements of this manual. If there is any problem, please inform the sales department immediately.

When purchasing the machine, please check whether the strip code on the rear panel of the chassis is complete, and whether the random accessories are complete.

Machines that have not been opened by a designated maintenance department will not be within the scope of the Three Guarantees.

It is recommended that you save the removed packaging materials and accessories so that they can be used for future handling or maintenance.

table of Contents

To customers	01
Local features	02
Connection instructions	03
Front panel name and function introduction	04
Rear panel name and function introduction	05
Function editing parameter usage	06-12
Parameter curve	13-14
Specifications and performance	15
Failure and overhaul	16



This machine is a compact, powerful audio processor based on DSP. It combines the functions of a variety of conventional products into a box with a height of only 1U. It is equipped with 2 input, 4 output and 2 input. Output, 4 input, 6 output, 4 input, 8 output, various models, flexible combination of multiple crossover modes, especially suitable for use in the show.

96KHz sampling frequency, 32-bit DSP processor, 24-bit A/D and D/A conversion;

Provide USB and RS485 interface to connect to the computer, connect up to 250 machines through RS485 interface, and special RS232 serial port, convenient for different occasions, and more than 1500 meters away from external computer to control;

It is very convenient, intuitive and concise to directly use the function keys and code wheel of the panel to set the function or connect the computer to control through the PC control software.

Stand-alone or PC control software can store 12 user programs;

The password lock panel control function can be set through the SYSTEM button of the panel to prevent the operation of the idle person from damaging the working state of the machine;

Each input has 31 segments of GEQ+10 segment PEQ, and outputs 10 segments of PEQ;

2×24 LCD blue backlight display function setting, 8-segment LED display input/output accurate digital level meter, mute and editing status;

The slope of the variable high/low pass filter can be set, with Bessel and Butterworth set to 12dB, 18dB, 24dB per octave, Linkwitz-Riley) can set 12dB, 24dB, 36dB, 48dB per octave;

The parameters of the high/low pass filter can be independently adjusted to achieve an asymmetrical crossover function;

Each input/output has delay and phase control and mute settings.

The delay can be up to 1000 ms. The delay unit can be selected in milliseconds (ms), meters (m) and feet (ft).

The output channel also controls gain, voltage limit, and select input channel signals, and can simultaneously select multiple output channels to correlate all parameters simultaneously.



Interface operation

The external interface of this series of machines can be controlled computer using USB, RS485 and RS232 interfaces. This machine is made.

Signal level

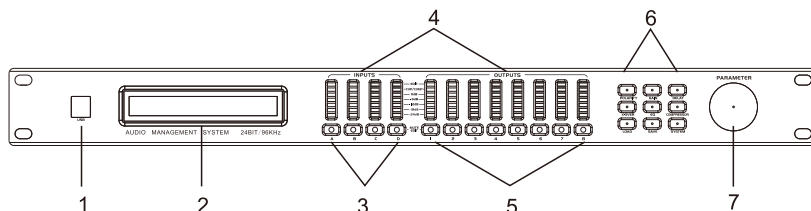
As with all signal processing equipment, the signal level supplied to the unit must be appropriate to avoid falling Low signal to noise ratio. The signal level of this series of machines can be selected by menu to reduce the shadow of this problem. When selecting the signal level, you should select +6dB of the level meter when the amount is large. The LED light just lights up. Since the reading of the meter is deliberately increased by 3dB, it is away from this time. The true peak is still 9dB. In order to carry out the equalization process, it is necessary to further reduce the loss. Enter the level to avoid the digital clipping of the gain caused by the unit. In the case of digital peak clipping, the top The red LED will illuminate. It must be noted that the large input levels given in the spec sheet are The point at which the peak is cut, not a safe, practical level. Be sure to ensure that the peak is not below the signal The next device in the chain, and there must be some margin when using equalization.

Ground

The grounding pins of all audio interfaces are directly connected to the grounding pins of the power socket. Also connected to this point. The power of this unit must be reliably grounded. Signal ground (0V) will be connected to the machine The ground of the box. To avoid the formation of a ground loop, the shield of the signal cable can only be grounded at one end. The usual rule is to ground only at the XLR interface of the output.

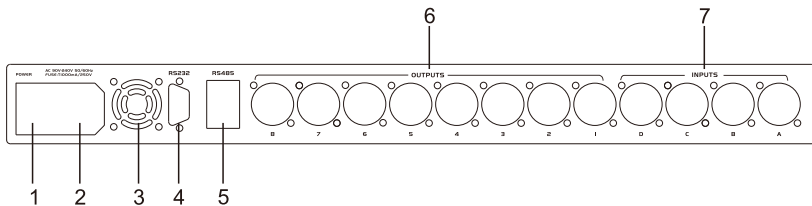
Front panel name and function introduction

Front panel layout:



1. The USB interface is connected to the PC for communication, and the related parameters are adjusted through the PC interface software. Used for the corresponding input and output sections.
2. LCD: Display menu options, output information and various parameters being adjusted.
3. Input mute, edit button
 - 1) Short press: mute/non-mute switch;
 - 2) Long press: Enter the input editing function interface. For details, please refer to the “Input Control Function Setting” section.
4. Level indicator: Used to indicate the dynamic display of the signal level.
5. Output mute, edit button
 - 1) Short press: mute/non-mute switch;
 - 2) Long press: Enter the output editing function interface. For details, please refer to the “Output Control Function Setting” section.
6. Function menu:
 - 1) Polarity: polarity setting 2) Gain: adjust gain
 - 3) Delay: delay setting 4) X-over: crossover setting
 - 5) EQ: equalization setting 6) Compressor: compression setting
 - 7) Load: call 8) Save: save 9) System: system related information
7. Digital encoder:
 - 1) Rotation: adjustment parameters 2) Press: Enter or OK, enter key

Rear panel layout:



1. Power switch (press the switch, turn on the power, work normally)
2. Power socket: The AC power input terminal of this unit. A power cord that can be used with it has been provided at random.
3. Cooling fan exhaust vent
4. RS232 serial port
5. RS485:
The RS485 port can be connected in series by network cable (up to 250 units can be connected), and then the RS485 port of any one of the machines can be selected. The serial connection can be remotely controlled by USB cable or 232 to 485 line and computer connection. Up to 1500m.
6. Output channel:
8 output channels (identified as CH1-CH8, in turn, 1st channel, 2nd channel, . . . 8th channel), each channel is equipped with a 3-core XLR socket. Each port is balanced, 2 is the hot end, 3 is the cold end, and 1 is the shield (ground) end.
7. Input channel:
4 input channels (identified as CHA-CHD, in turn, A channel, B channel, ... D channel), each audio is equipped with a 3-core XLR socket. Each port is balanced, 2 is the hot end, 3 is the cold end, and 1 is the shield (ground) end.

Edit interface:

Boot interface: power on, the LCD screen shows the current working mode of the machine, as shown in the figure:

Mode: 8
Name: USER1

When the machine does not operate for a while, the display automatically returns to this standby screen.

Input control function settings:

Input control function keys (4 keys correspond to 4 input channels: INA-IND, short press and long press):

- 1) Short press: mute/non-mute switch (when mute, the red light at the bottom of the corresponding channel is on; when it is not mute, the red light is off).
 - 2) Long press: Enter the input editing function interface (the red light at the top of the corresponding channel is on). The INA-IND input setting method is the same. The INA input setting is taken as an example to introduce the process of setting parameters: long press (press time about 2 seconds) INA button on the left side of the panel, you can enter the input editing function interface, press the Polarity, Gain, Delay and EQ edit keys in the function menu. Make settings for each parameter.
1. Press the Polarity edit button in the function menu to enter the polarity setting. The interface displays:

InA Polarity
Pol=Invert

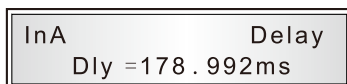
The polarity of each input can be adjusted independently. The polarity can be reversed (inverted by 180 degrees) by polarity adjustment. To adjust the polarity: press the digital encoder and rotate it to select.

2. Press the Gain Edit button in the function menu to enter the gain setting. The interface displays:

InA Gain : 0.0dB
Noise Gate : -80dB

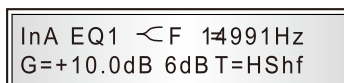
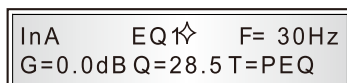
Gain and noise gates are provided for each input channel, and the gain can be adjusted from -36 to +12. After entering the interface, adjust the gain value by rotating the edit wheel button. After adjusting, press the edit wheel, the cursor moves to the editable position of the noise gate value, and then edit the value by rotating the edit wheel. The noise threshold range is: -120dB to 0dB.

3. Press the Delay edit button in the function menu to enter the delay setting. The interface displays:



Each input channel has independent delay control. The delay value is 0-1000ms, less than 10ms, and the step is 21 μ s; when it is greater than 10ms, the step is 1ms. To adjust the delay setting: press the digital encoder and rotate to adjust the parameters. Press the digital encoder cursor again to switch to ms (M\Ft) and rotate the digital encoder to convert the unit.

4. Press the EQ Edit button in the function menu to enter the EQ setting. The interface displays:



Each input channel has 31 GEQs and 10 segments of PEQ. Each press of the EQ button switches EQ/GEQ. In the PEQ state, the adjustment parameters are: center frequency point: 20 Hz - 20 kHz, step: 1 Hz, Q value: 0.404 to 28.8, gain: ± 20 dB, step size is 0.1 dB. Equilibrium setting: Each press of the digital encoder can move any of the cursor selection interface (example in the above figure), and rotate the digital encoder to adjust each parameter.

Output control function settings:

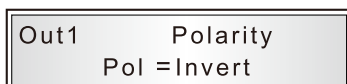
Output control function keys (8 keys correspond to 8 output channels: OUT1-OUT8, short press and long press):

1) Short press: mute/non-mute switch (when mute, the red light at the bottom of the corresponding channel is on; when it is not mute, the red light is on).

2) Long press: Enter the output editing function interface (the red light at the top of the corresponding channel is on). The OUT1-OUT8 output setting method is the same. Take the OUT1 output setting as an example to introduce the process of setting parameters: Long press

(press time about 2 seconds) OUT1 button on the left side of the panel, you can enter the output editing function interface, press Polarity, Gain, Delay, X-over in the function menu. The EQ and Compressor edit keys allow you to set various parameters.

1. Press the Polarity edit button in the function menu to enter the polarity setting. The interface displays:



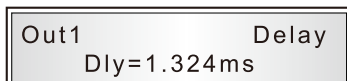
The polarity of each output channel can be adjusted independently. The polarity can be reversed (inverted by 180 degrees) by polarity adjustment. When the outputs are in linkage mode, the polarity screen is still independent. The parameter settings are the same as the input channel Polarity setting method.

2. Press the Gain Edit button in the function menu to enter the gain setting. The interface displays:



The gain of each output is independently adjustable. The output gain is adjusted from -36dB to +12dB in steps of 0.1 dB. Adjust the gain: Every time you press the digital encoder, you can move the cursor to select any one of Gain: 3. 0dB, A: ON, B: OFF, C: OFF, D: OFF (example above), rotate the digital encoder. Each parameter can be adjusted.

3. Press the Delay edit button in the function menu to enter the delay setting. The interface displays:



Each output channel has independent delay control. The delay value is 0-1000ms, less than 10ms, the step is 21μs; greater than 10ms, the step is 1ms. The parameter setting is the same as the input channel Delay setting method.

4. Press the X-over edit button in the function menu to enter the crossover setting. The interface displays:



High-pass filtering (HPF) and low-pass filtering (LPF) can be set separately for each output channel. The selectable responses are: Bessel, Butterworth, Linkwitz-Riley. Frequency turning point: 20Hz-20KHz, where Bessel, Butterworth attenuation slope is: 12dB/oct, 18dB/oct, 24dB/oct; Linkwitz-Riley attenuation slope: 12dB/oct, 24dB/oct, 36dB/oct, 48dB/oct. High-low-pass filter settings: Each time you press the X-over edit button, the interface switches between the high/low-pass filters. Each press of the digital encoder moves the cursor to select 25Hz, Bessel, 24dB/oct (As shown in the above figure, the rotary digital encoder can adjust each parameter.

5. Press the EQ Edit button in the function menu to enter the EQ setting. The interface displays:



Each output channel has 10 segments of PEQ. The parameter is adjusted in the PEQ state: center frequency point: 20 Hz - 20 kHz, center frequency point: 20 Hz - 20 kHz, step: 1 Hz, Q value: 0.404 to 28.8, gain: ± 20 dB, step size is 0.1 dB. Equilibrium setting: Each time you press the digital encoder, you can move the cursor to select any one of the screens (example above), and rotate the digital encoder to adjust each parameter.

6. Press the Compressor Edit button in the function menu to enter the compression settings. The interface displays:



The compressor can be set separately for each soft exit channel. The adjustable parameters are: start time: 0.3ms-100ms, less than 1ms, step size is 0.1ms, greater than 1ms, step size is 1ms; release time: can be set to 2 Multiple, 4x, 6x, 8x, 16x, 32x start-up times; the compression ratio ranges up to 127:1.



Call the menu:

Press the Load edit button in the function menu to enter the call copy settings, rotate the digital encoder boundary

Face display: Select: Group Load, Select: Channels Copy.

1. Select: Group Load

Used to call a set of data, the interface is displayed as:

Select and Load 1: USER 1

Press the digital encoder to enter the first level submenu, and the rotary digital encoder can be selected. 1- 12 sets of data, press the digital encoder again, it is OK.

2. Select: Channels Copy

After pressing the digital encoder, the interface is displayed as:

Copy from :InputA to :InputC

Each time you press the digital encoder, you can move the cursor up and down. You can copy any input or output. Item, rotary digital encoder can choose Copy from as InputA-D or Output1-8. You can choose Copy to be InputA-D or Output1- 8.

1) Copy from: You can copy any channel to any channel.

2) Copy to channel: Copy any channel to any channel.

Save menu:

Used to store a set of data. When the user sets the data (including all the parameter settings of 4 sets of input and 8 sets of output), enter this menu to save. The erase and save operations can be performed under this menu. The rotary digital encoder interface displays: Select: Store, Select: Erase

Select :Store 1, USER 1

Function editing parameter usage

There are 12 groups available for users to save, using the call menu (Load), can meet 12 groups of customers each. Since the requirement, in addition to saving the data, the existing data can be erased under this menu. EnterPress this digital encoder on this menu (the value flashes), rotate the digital encoder, select 1- 12Group any group, press the digital encoder, enter the save page, and then press the digital encoder to nameSave (named to enter 12 characters, rotate the digital encoder to convert the name characters), the page appears "Storing Successfully is saved. If you need to change the naming, you can re-enter, you can enterLine changes.

System menu:

Press the System Edit button in the function menu to enter the system menu settings, rotate the digital encoderDisplayed in sequence: 1.Device ID Setup, 2.Password, 3.Power On Setup, 4.Backlight Setup, 5.Current Program, 6. System Information.

1. Device ID Setup

Set the machine ID number, which is used to connect with the PC software.



SYSTEM SETUP MENU
1. Device ID Setup

Press the digital encoder to enter the setup page. Rotate the digital encoder to adjust the parameters to 1-250.

2. Password

It is used for password setting. After the user sets the data, the machine has a password function to prevent others from mishandling.



SYSTEM SETUP MENU
2. Password

Press the digital encoder to enter the password setting page, and press again to enter a set of passwords consisting of 1 to 4 digits. Press the digital encoder to enter the password. Rotate the digital encoder to select any number of "1, 2, 3. . ." and then press the digital encoder to determine. If you have locked with a password, press the System Edit button, then press the Digital Encoder to enter the password.



3. Power on setup

Set the power-on state, keep the data state saved, or turn it on completely.

SYSTEM SETUP MENU 3. Power On Setup
--

After pressing the digital encoder, rotate the digital encoder with either Keep State or All Mute.

4. Backlight Setup

It is used to set the backlight to be on or off automatically after 10 seconds to enter the power saving mode (the operation method is the same as 3).

SYSTEM SETUP MENU 4. Backlight Setup

5. Current Program

The currently called program group number is displayed (the operation method is the same as 3).

SYSTEM SETUP MENU 5. Current Program

6. System Information

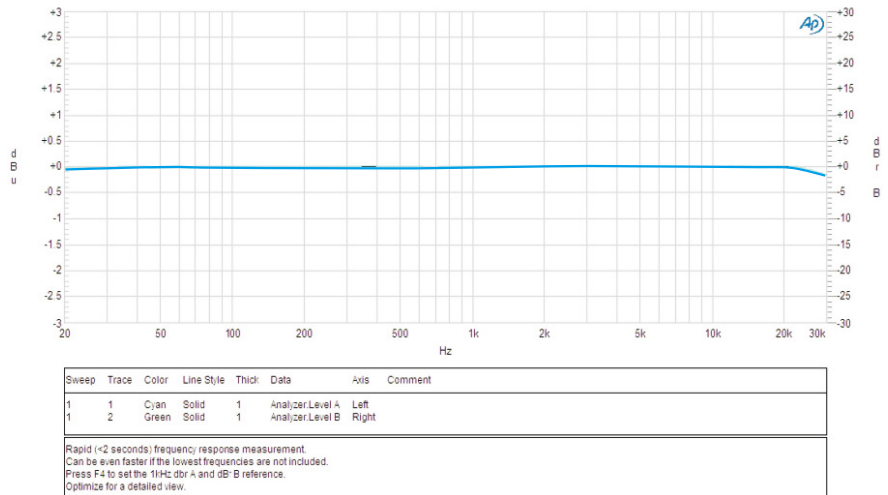
Display system information.

SYSTEM SETUP MENU 6. System Information
--

Parameter curve

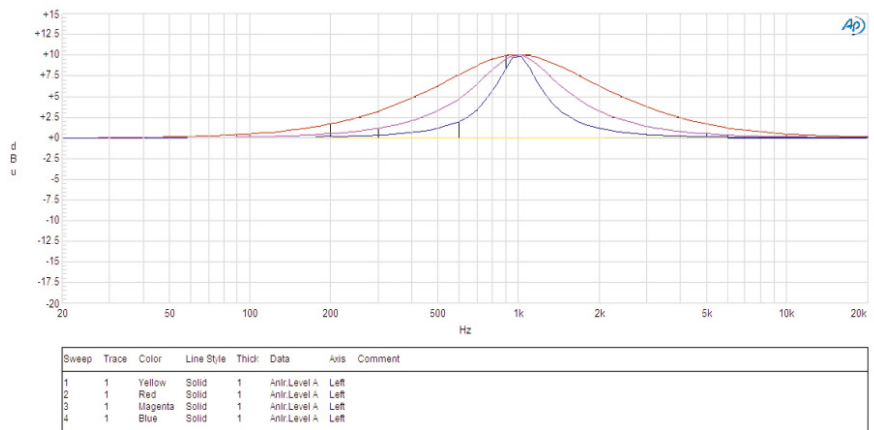
EQ curve:

Audio Precision



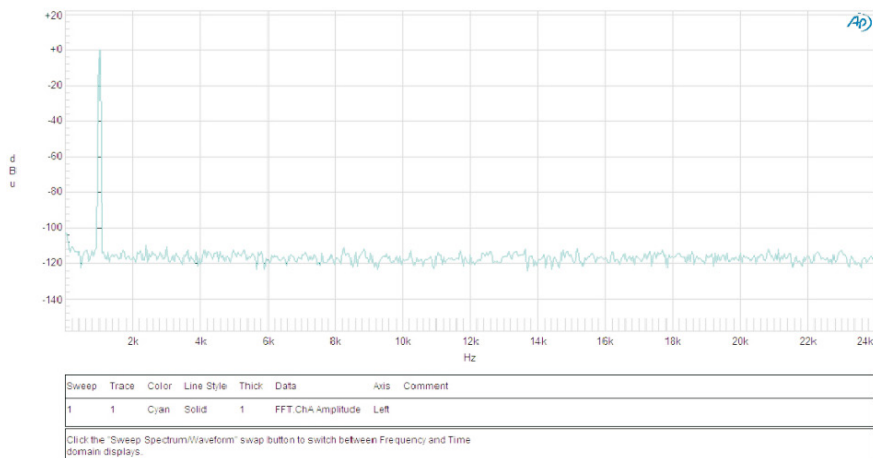
Audio Precision

09/03/14 11:32:50



FFT curve:

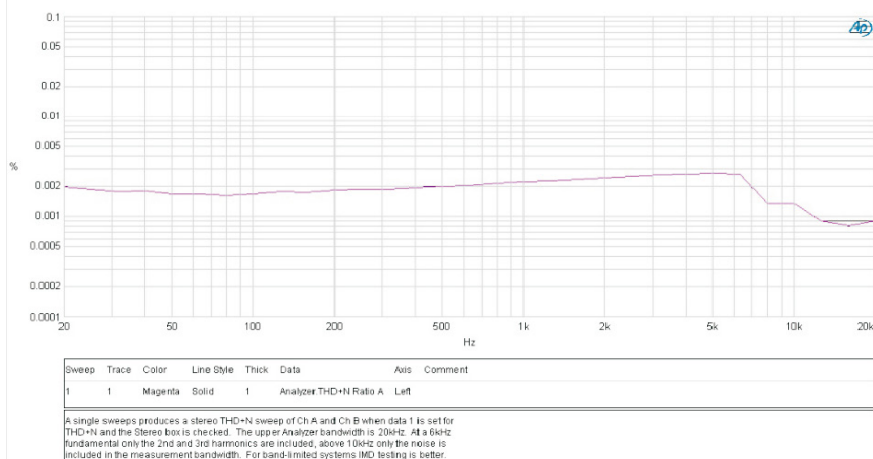
Audio Precision



Distortion curve:

Audio Precision

A-A THD+N vs FREQUENCY



Specifications and performance indicators

Input channel and socket		2 XLR female	2 XLR female	3 XLR female	4 XLR female
Output channel and socket		4 XLR male	6 XLR male	6 XLR male	8 XLR male
input resistance		Balance: 20KΩ			
Output impedance		Balance: 100Ω			
PC interface		Panel 1 USB, Backplane 2 RS485 (RJ-45 seats) + 1 RS232			
Co-simulation ratio		> 70dB (1KHz)			
Input range		≥17dBu			
Frequency response		20Hz-20KHz (-0.5dB)			
Signal to noise ratio		> 110dB			
Distortion		< 0.01%OUTPUT=0dBu/1KHz			
Channel separation		> 80dB (1KHz)			
Input channel function	Mute	Separate mute control for each channel			
	Delay	Each output channel has independent delay control. The delay value is 0-1000ms, less than 10ms, and the step is 21μs; when it is greater than 10ms, the step is 1ms.			
	polarity	In phase, inverting			
	EQ	Each input channel has 31 segments of GEQ and 10 segments of PEQ. Adjust the parameters in PEQ state: center frequency point: 20Hz-20KHz, step: 1Hz, Q value: 0.404 to 28.8, gain: ±20 dB, step size is 0.1dB			
Output channel function	Mute	Separate mute control for each channel			
	select	Each output channel can be individually selected for different input channels, or any combination of input channels can be selected.			
	Gain	Adjustment range: -36dB to +12dB, step size is 0.1dB			
	Delay	Each output channel has independent delay control. The delay value is 0-1000ms, less than 10ms, and the step is 21μs; when it is greater than 10ms, the step is 1ms.			
	polarity	In phase, inverting			
	EQ	10 equalizations per output channel: PEQ/Lo-Shelf/Hi-Shelf			
	Frequency divider	High-pass filtering (HPF) and low-pass filtering (LPF) can be set separately for each output channel. The selectable responses are: Bessel, Butterworth, Linkwitz-Riley. Frequency turning point: 20Hz-20KHz, where Bessel, Butterworth attenuation slope is: 12dB/oct, 18dB/oct, 24dB/oct; Linkwitz-Riley attenuation slope: 12dB/oct, 24dB/oct, 36dB/oct, 48dB/oct.			
	compressor	The compressor can be set separately for each output channel. The adjustable parameters are: threshold: ±20dBu, step distance is 0.05dBu, start time: 3ms-100ms, less than 1ms, step size is 0.1ms; greater than 1ms, step size is 1ms Release time: can be set to 2 times, 4 times, 6 times, 8 times, 16 times, 32 times starting time			
processor		96KHz sampling frequency, 32-bit DSP processor, 24-bit A/D and D/A conversion			
Display		2X24LCD blue backlight display setting, 8-segment LED display input/output level, mute and edit status			
Power consumption		≤30W			
power supply		AC 90V/240V 50Hz/60Hz			
Package dimensions		1PC: 536×410×80 (mm)			
Net weight / Gross weight		1PCS: 4.1/5 (Kg)			

Product performance continues to improve, the above specifications are subject to change



note

In order to avoid unnecessary loss to you during transportation, when the unit malfunctions, and Not necessarily a problem with this machine. Please check the machine in detail before sending the repair. After the barrier, please return the machine to our after-sales service center, we will provide you with professional Repair service.

configuration list		
No.	name	Quantity
1	machine	1
2	Instruction manual	1
3	power cable	1



Before using the device, please read the instructions carefully and follow the warnings about operation and use. This manual should be kept for future reference.

- ◆ **power supply:** This unit can only be used with the type of power source indicated in the instruction manual.
- ◆ **Power line protection:** Pay attention to avoid the power cord being crushed by heavy objects. Pay special attention to the plug of the power cord, the outlet of the device and the convenient socket. Do not pull or pump the power cord.
- ◆ **Moisture moisture:** Do not use it near a water source, such as a bathtub, sink, kitchen sink, wet basement in a wash basin, near a swimming pool, etc.
- ◆ **Temperature:** The unit must be kept away from heat. For example: heat sinks, heating resistors, various furnaces and other heat generating devices (including amplifiers).
- ◆ **Electric shock:** Care must be taken to prevent items or water from falling into the core. If metal or other conductive objects are dropped, there is a risk of electric shock shorting inside the unit.
- ◆ **Cover removal:** Due to the high voltage in the machine memory, non-electronic professional technicians should not disassemble the casing. If the internal electronic components are abnormally contacted, serious electric shock may occur. The company is not responsible for this incident.
- ◆ **Clean:** This unit can only be used with the type of power source indicated in the instruction manual.
- ◆ **Abnormal smell:** When abnormal smell or smoke is found, immediately turn off the power and pull out the plug, contact the supplier or the nearest maintenance department for repair service.
- ◆ **Long idle:**
 - A. For safety reasons, please turn off the power switch and unplug the power cord. In case of fire.
 - B. Prevent water, metal, flammable materials or other foreign matter from falling into the machine to avoid electric shock and fire accidents. In the event of such an accident, immediately turn off the power and stop using it. Contact the company's service center or the store where you are looking for a repair service.
- ◆ **Note:** Do not press the power plug under the machine or in the middle of other items; do not set the power supply to a place where people come and go frequently, so as to avoid electric shock or fire accidents caused by broken plugs.

Warning: To prevent fire or electric shock,
do not place this deviceSet in a
rain or wet environment.

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
Note: To avoid electric shock, do not remove the cove (or cover). If The fault should be repaired by professional maintenance personnel!		