



High Precision Series

HP2150 – HP2240

Digital Amplified Mixer

User's Manual

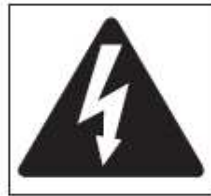
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1. Important safety instructions



This symbol indicates the presence of important directions for use and information that should be given particular attention so as to use the product properly.



This symbol indicates the presence of "dangerous voltage" that may cause the risk of electrical shock. Pay the utmost attention and proceed cautiously.

1. Follow carefully the attached documentation and keep it for future reference
2. Comply with the warnings
3. Store the packaging and check that all material is in excellent conditions.
4. Do not use water near the product, do not pour water or any other liquid on the amplifier. Do not use it with wet hands or feet into the water.
5. Do not use next to heat sources such as radiators, stoves or the like.
6. Check the integrity of the mains cable. Do not tread on the cable and do not squeeze the plug.
7. Connect the plug to a socket equipped with grounding. Do not camper the plug. If the plug supplied is not consistent with your socket, please apply to an electrician for its replacement.
8. Connect to supply mains with the same voltage as indicated on the back of the amplifier.
9. Install the amplifier in compliance with the instructions.
10. Do not obstruct the air ducts.
11. Disconnect the appliance in case of storm and if unused.
12. Connect according to the instructions only.
13. Do not connect input signal higher than that indicated in the manual.
14. Do not connect the amplifier output to the input of another channel.
15. Do not connect any output of the amplifier to power sources such as battery, voltage supply or outlet, regardless of the amplifier is on or off.
16. Keep the volume controls to a minimum during the amplifier switching on/off .
17. Do not remove the upper or lower cover: there is a risk of electrical shock.
18. Do not try to self-repair the appliance, but apply to qualified personnel.
19. Clean with a dry cloth only.
20. The product shall be handled by skilled personnel in the following cases:
 - mains cable or plug damaged
 - Exposure of the product to rain or humidity
 - Some liquid entered inside the unit.
 - An object fell on the unit
 - The unit fell down and is damaged
 - The product does not work correctly or shows a remarkable change of performance.
21. A careful supervision is necessary if the product is used in the presence of children or inexperienced adults.
22. This product could produce sound levels, which cause damage to the hearing. Pay the utmost attention and do not operate at high level of volume or at an uncomfortable level for a long time. Consult an audiometric specialist in case of hearing loss or complaints.

2. Declaration of conformity

This device conforms to the requirements of the EMC directive 89/336/EEC, amended by 92/31/EEC, and the requirements of the Low Voltage Directive 73/23/EEC, amended by 93/68/EEC.

Standards Applied:
EN55103-1 (Emissions)
EN55103-2 (Immunity)
EN60065, Class I (Safety)



3. User's liability



3.1. Damages to the loudspeakers

Always check the peak and continuous power of the loudspeakers.

This amplifier is extremely powerful and can be potentially dangerous both for the loudspeakers and for the persons.

Most loudspeakers may be easily damaged or broken. Even if there is a gain reduction through the attenuators on the amplifier's front panel, it is still possible to reach the maximum output power if the input signal level is high enough.



3.2. Dangerous output voltage

The amplifier can generate hazardous output voltage. Do not touch exposed cables of loudspeakers with the amplifier in operation.



3.3 Radio interferences

A sample of this product has been tested and approved to meet the requirements of the Electromagnetic Compatibility Directive (EMC). These requirements have been defined so as to provide reasonable protection against dangerous interference of electrical equipment. Whenever this product has not been installed or handled according to these guidelines, it might interfere with other equipment such as radio receivers. However, there is no guarantee that they should not occur in a specific installation. Should this equipment interfere with transceiver equipment (such possibility can be checked by switching on and off the device), the user should try to cancel the interference by observing one or more of the following measures:

- Increase the distance between the device and the receiver.
- Connect the device to a plug linked to a different circuit with respect to the one to which the receiver is connected.
- Redirect or move the receiver's antenna.
- Make sure that the unit concerned conforms to the EMC immunity limits (CE-labelled). All electrical equipment sold in the EC should be approved as for what concerns protection against electromagnetic fields, high tension and radio interference.
- Contact qualified personnel.

4. Introduction

Congratulations on choosing XTE device and thanks for trusting us and our products. Your device has been carefully planned in the smallest details, starting with every part of its equipment till final assemblage. All products XTE are made with the main purpose of guaranteeing our clients' full satisfaction, thus we underline that the product you have chosen uses the most advanced technology.

An improper use of the device can compromise its correct operation. Therefore we recommend you to carefully and correctly use it.

Read this manual carefully as it contains essential information for a safe use of your device.

4.1. Unpacking

Immediately inspect the package and its content so as to check whether there are any signs of damage. After unpacking check the product and all parts, if you notice any damage inform your dealer immediately.

It is advisable to save the packaging materials even if the amplifier shows no sign of shipping damage; you might have to return it to XTE or to one of its dealers. Use the original package only, which is the best way to protect the equipment from shipping mishandling.

4.2. Assembly

Metal framing of all the XTE products is suitable to be supported on a surface (table, etc.) and is equipped with separated stirrups for assembly in 19" rack standard.

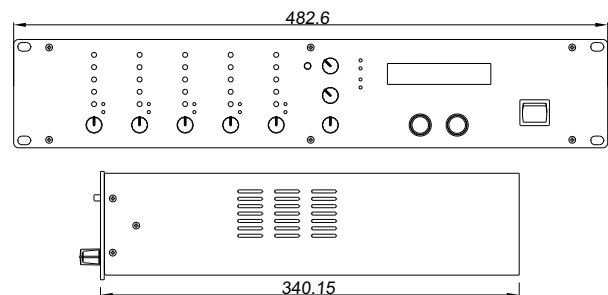


Fig1. Dimension for mounting

Pay particular attention during the installation; we remind you that the devices should not be installed in places with:

- High temperatures
- Dust and excessive humidity
- Presence of intense magnetic fields
- Water next to the component
- Vibrations
- Closed spaces inhibiting a proper ventilation

5. Description

HP2150 and HP2240 are bi-amplified sound systems that combine the flexibility of 7 inputs analog mixer with the high quality audio processing of dual channel 96kHz sample rate DSP and the high efficiency of class D switching amplifiers.

This results in a new generation of compact devices which allow a quick and easy solution for whichever audio installations where clear and intelligible audio broadcasting is an essential requirement, such as places of worship, court halls and auditoriums.

The DSP configuration is intuitive and easy handling thanks to the two rotary encoders and the 2x20 backlight LCD display that allow the navigation of the Menu.

The device is equipped with its own graphic user interface.

This makes programming simple and straightforward – Laptop or PC are no longer required.

Up to 20 different sets of settings, so-called „presets“, can be programmed and can easily be recalled by the user for each occasion as required.

The maximum sound effect accuracy is guaranteed from the analog noise gate and 3 band EQ for each input and also from the 31 Band Graphic EQ and the 6 PEQ available in the DSP processor parameters.

The two channel Class D integrated power unit (2x150W and 2x240W) allows high power range in compact size and low weight.

Both models operate on 230 VAC, 50Hz and may be desk or rack mounted.

The High Precision Series is extremely versatile, all in one solution, yet cost-effective, and is easy to install and operate.

6. Features

Amplified Mixer Section:

- Constant Impedance and constant Voltage outputs
- 2 Amplified Outputs
- Switching power supply
- Class D output circuit topology
- Low weight high Efficiency
- Full protections
- Low mains current draw
- Output Limiter
- Input signal presence and Clip indicators
- Output Clip and Protect state indicators
- 5 balanced Mic/Line XLR inputs selectable
- 2 stereo Auxiliary RCA inputs
- 1 Stereo REC RCA output
- 3 band Equalizer for each channel
- Noise Gate function for each channel
- 2 balanced XLR processed outputs
- 1 balanced XLR Direct output
- Selectable 48Vdc Phantom Supply
- Advanced Priority System
- Arranged for 19" rack mounting in 2 unit space

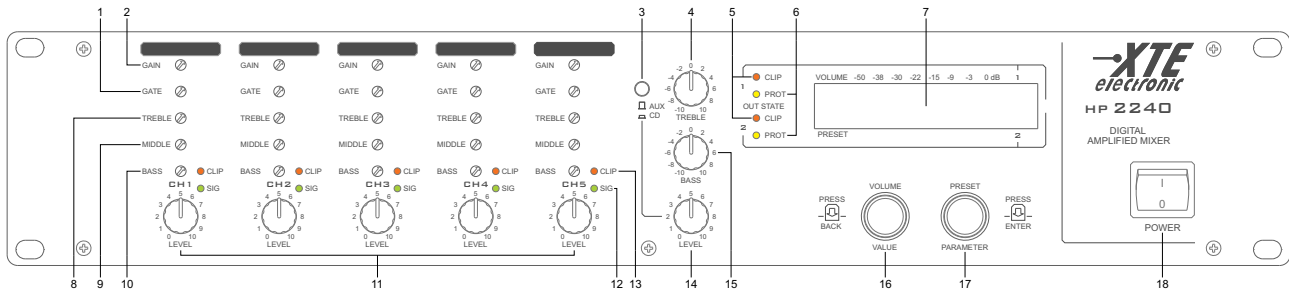
DSP Section:

- 2 channels 24bit/96kHz DSP Processor
- 20 memory Presets
- 4 memory Parameterset
- 31band Graphic EQ for each channel
- 6 PEQ for each channel
- Delay (680ms/233mt Max)
- Preamplifier Limiter
- User or qualified personnel access levels
- 2x20 backlight LCD Display
- Easy handling configuration
- Volume/Preset control protection

Optional Features

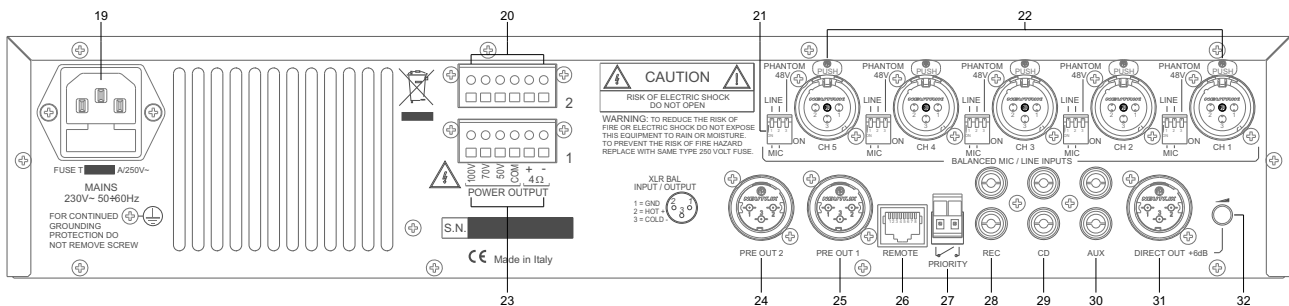
- C656-RJ Remote control optional card for the control of the master volume level of each channel
- C714 Din Don optional card with trimmer to adjust the volume (internal adjustment)

7. Front Panel: Controls and Indicators



1. GATE – MIC/LINE input Noise Gate activation threshold control
2. GAIN – MIC/LINE input gain control
3. AUX / CD – AUX/CD input selector
4. TREBLE – AUX/CD inputs Treble tone control
5. CLIP – Output 1 and Output 2 signal Clip led indicator
6. PROT – Power unit 1 and Power unit 2 protect state led indicator
7. LCD – 20x2 Back light LCD display for DSP parameters view
8. TREBLE – MIC/LINE input Treble tone control
9. MIDDLE – MIC/LINE input Middle tone control
10. BASS – MIC/LINE input Bass tone control
11. LEVEL – MIC/LINE input level control
12. SIG – MIC/LINE input Signal presence led indicator
13. CLIP – MIC/LINE input signal Clip led indicator
14. LEVEL – AUX/CD inputs level control
15. BASS – AUX/CD inputs Bass level control
16. VOLUME / VALUE / BACK – Volume, Value and Back navigation control for DSP processor
17. PRESET / PARAMETER / ENTER – Preset, Parameter and Enter navigation control for DSP
18. POWER – Power on switch

8. Back Panel: Controls and Connectors



19. MAINS – AC 230V power supply socket, with incorporated protection fuse
20. POWER OUT – Output 2 connector for loudspeaker lines connection
21. MICROSWITCHES – MIC/LINE input sensitivity selector and 48V Phantom activation
22. MIC / LINE – Balanced inputs with variable sensitivity
23. POWER OUT – Output 1 connector for loudspeaker lines connection
24. PRE OUT 2 – Mixed and processed output of the DSP channel 2
25. PRE OUT 1 – Mixed and processed output of the DSP channel 1
26. REMOTE – RJ45 connector for remote Master level and Priority control
27. PRIORITY – Phoenix connector for configurable priority function control
28. REC – Mixed stereo line output
29. CD – Stereo CD input
30. AUX – Stereo line input
31. DIRECT OUT – Mixed output of the amplifier without DSP processing
32. LEVEL – Direct out level control

9. Power Supply

The unit is expected to work with 230 VCA – 50/60 Hz distribution system.

In case of power dysfunction, check the outside protection fuses and eventually replace them with others of same calibration; if one of them burns out immediately, do not go on and have check the unit by qualified personnel.

Take away plug from 230 VCA electric power socket always, before removing fuses and, in any case, open the unit framing.

10. Connections

10.1. General criteria

In order to allow the equipment to work correctly, it is advisable to comply with a number of general criteria when making the connections:

- Avoid positioning cables or microphones on the cabinet of the equipment.
- Avoid laying the signal lines parallel to the power-supply lines. Keep a minimum distance of 30/40 cm.
- Position the input lines and the output lines at a distance from one another.
- In order to avoid acoustic feedback (the Larsen effect), position the microphones out of the angle of coverage of the loudspeakers.

10.2. Balanced Mic / Line Inputs

The 5 female XLR input sockets (22) for the mic / line level signals are located on the rear panel of the equipment. The figure Fig2. shows the connections to these sockets. These inputs are electronically balanced.

The mic / line sensitivity could be selected through the multi-micro switch (21) placed on the left of the socket.

48Vdc “phantom” supply could be joint to each socket (on the same balanced phonic line), through the multi-micro switch (21) placed on the left of the socket; therefore, before connecting a microphone it should pay attention to the model (if dynamic or electret). In case of dynamic microphone do not insert 48 VCC; insert it with electret microphone only.

10.3. Direct Out

The male XLR direct output socket (31) for the preamplified signal not DSP processed are located on the rear panel of the equipment. The figure Fig2. shows the connections to this socket. This output is electronically balanced.

The output signal level could be adjusted through the potentiometer (32) placed on the right of the socket.

10.4. Pre Out 1 / Pre Out 2

The 2 male XLR output sockets (24-25) for the preamplified signal DSP processed are located on the rear panel of the equipment. The figure Fig2. shows the connections to these sockets. These outputs are electronically balanced.



Fig2. XLR Bal Input / Output Pin-out

10.5. CD / AUX

The 2 couple of mono female RCA input sockets (29-30) for the CD and AUX sources are located on the rear panel of the equipment. These inputs are unbalanced.

These 2 inputs are alternatively selected by a switch (3) located on the front panel.

When the CD input is selected by the switch located on the front panel, the AUX input is directly mixed with the other inputs for allows the connection in cascade of an external mixer's Pre Out in the way to expand the system input capability. This feature could be deactivate following the indications described in the Fig6.

10.6. REC

The couple of mono female RCA output socket (28) for the REC preamplified signal not DSP and 3 band EQ of each channel processed is located on the rear panel of the equipment. This output is unbalanced.

10.7. Remote / Priority

The female RJ45 socket (26) for the remote control are located on the rear panel of the equipment.

The Priority function is also available on the 2 pole phoenix-type (27) connector located on the right of the socket. The Priority function could active the chime if C714 Din Don optional card is used.

The remote master volume level control for each output channel is available if the C656-RJ Remote control optional cards is used.

The remote control and priority functions are deeply described in the chapter 12 advanced functions.



10.8. Power Output

The device is provided with a multi-way power output terminal strip for constant-voltage distribution (50, 70, 100 V) and low impedance (4 Ohms) systems (20-23).

Constant voltage lines

50, 70, 100 V terminals should be used with each loudspeaker equipped with impedance-matching transformers and parallel connected. This fact makes the system easy to create and, if any of the loudspeakers should be disconnected from the line for any reason, the rest of the system would continue to function properly. The figure Fig3. shows the connections of the line to these sockets.

In order to achieve the maximum efficiency of the system and to take precautions from amplifier bad working, it is necessary to check the effective total power handling of the loudspeakers that has to be equal or lower than the RMS power value of used amplifier. It's a good rule arranging a 10-20% safety margin on the amplifier power capability.

Constant impedance lines

4 Ohms terminal should be used.

In order to achieve the maximum efficiency of the system and to take precautions from amplifier bad working, it is necessary to check the effective loading impedance of the lines. The total speakers impedance should be equal or higher than pre-selected value for connection.

To get that, each loudspeaker should be without impedance-matching transformer and should be connected in series or in series-parallel groups; In any case loudspeakers should also have the same power handling. The figure Fig4. shows the connections of the line to these sockets.

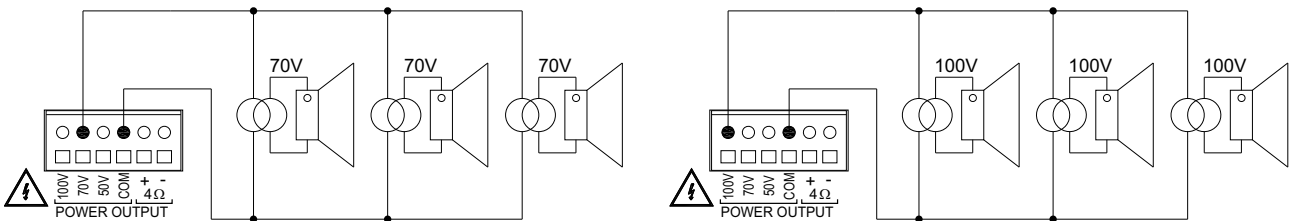


Fig3. Constant Voltage Lines

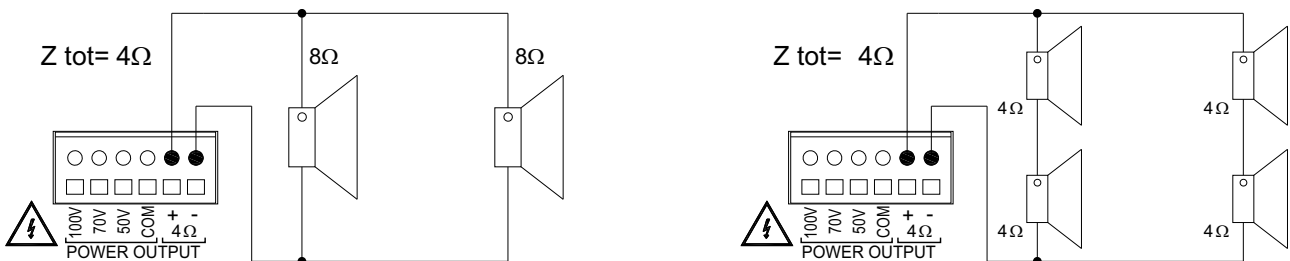


Fig4. Constant Impedance Lines

11. Protection Systems

In addition to the usual protection consisting of fuses, these products are complete of different protection devices in order to safeguard them from possible risks of damage. Protection conditions are signalled by the fact that the PROT (6) signalling lamp located on the front panel of the equipment will light (Short Circuit excluded), the unit will stop working and only the fan will continue to run.

11.1. Power Output Short Circuit

Applying a lower loading impedance than the rated value means requiring the equipment to supply a power higher than it can do on a continuous basis.

In order to avoid this problem, the units are equipped with a circuit protecting them against overloads that protects automatically.

The protection circuit will be tripped immediately on the amplifier if any of the following cases occurs:

- Short circuit on one of the loudspeaker outputs.
- Loading impedance less than 50% of the rated value.
- power required of the loudspeaker system connected to the constant-voltage lines higher than the power that the amplifier is able to deliver.

Overload conditions are signalled by the fact that the unit doesn't supply any amplified signal at the power output.

The equipment will resume normal operation after a power cycle as soon as the cause of the overload has been eliminated.

11.2. Turn On / Turn Off Delay

A mute circuit with relay, with a delayed starting up and immediate power turning off, has been inserted in order to avoid the switch-on/turn-off transients that may cause damage to the loudspeakers.

11.3. Power Unit Over Temperature

The thermal protection is of the self-resetting type, and is tripped when the equipment reaches an excessively high temperature.

This may be due, for example, to the fact that the ambient temperature is too high or to the insufficient ventilation of the rack cabinet.

The equipment will resume normal operation as soon as the cause of the temperature overload has been eliminated.

11.4. Power Supply Over Voltage

The A.C. voltage is monitored; if its value does not fall within the correct running range (over voltage) the supply will be automatically blocked. The amplifier will restart when the main supply voltage is under the maximum running voltage.

11.5. Power Supply Soft Start

The units are provided with a soft-start system to reduce the inrush current when switched on. This feature is particularly useful in multiple devices installations.

12. Advanced Functions

12.1. Noise Gate

A Noise Gate circuit has been inserted for each input channel in order to minimize the background noise on the output when no signal is applied at the input. The channel opening threshold could be adjusted through the controls (1) located on the front panel of the equipment. The Fig6 shows available internal setting for the noise gate circuit.

12.2. Remote

The remote master volume level control for each output channel is available if the C656-RJ Remote control optional cards is used. The figure Fig6. shows the C656-RJ insertion operation. Connection with the female RJ45 socket (26) must be via shielded cable without section limitations for distances up to 150 mt. The figure Fig5. shows the connections to these sockets. An external pot (10K) can be connected for remote master volume level control for each output channel or a switch for the mute control. The external pot is governed by the master level of the amplifier allowing the installer to set the volume, then lock the amplifier in a rack, leaving the user with just a master volume control that cannot go beyond the level set on the master control.

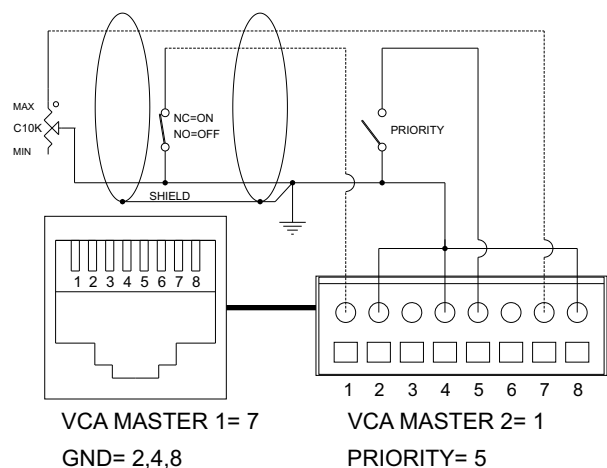


Fig5. Remote Socket Pin-out

12.3. Priority

A priority circuit has been inserted in order to softening one or more setted input channels by the priority control in accord with the system requirements.

Internal jumpers are provided to assign muting of the channels independently. From the factory, muting is assigned to all input channels.

The figure Fig6. shows the instructions to assign the muting of the channels.

A Normally Open input is available on the Remote RJ45 socket (26) and also on the Priority 2 pole phoenix-type connector (27) for the connection of paging microphone with priority control or to be controlled from external devices.

The Priority function could active the chime if C714 Din Don optional card is used.

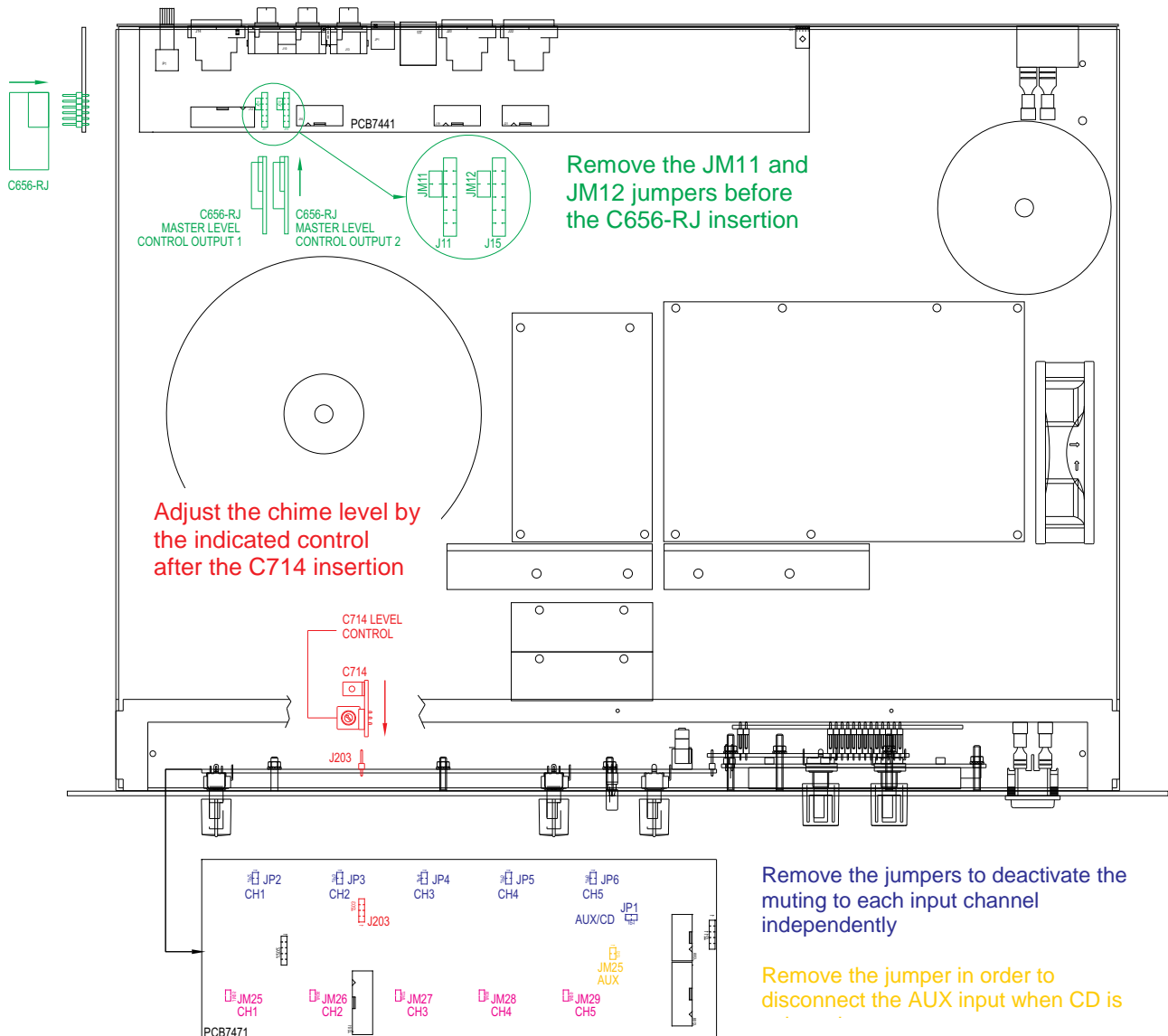
The figure Fig6. shows the C714 insertion operation and level control.



The following modifications are to be performed by qualified audio technicians only.

NOTE: To avoid frustration, check this section BEFORE installing your mixer in the rack!

NOTE: Fix the connection by silicon glue after the optional cards insertion



Remove the solder jumper in order to set the noise gate activation threshold at the lower value for the channel activation also with very low input signal. The Gate (1) control will be deactivated.

Fig6. Internal Adjustment and Modifications

13. Advanced Functions - DSP Section

13.1. Programmable settings („Presets“)

The DSP combines numerous integrated functions with very simple operation. Even in acoustically difficult environments, best results are achieved. So-called „Presets“ can easily be programmed. No less than 20 of these preset slots enable programming for any application and make them available to the user at the touch of one’s fingertips.

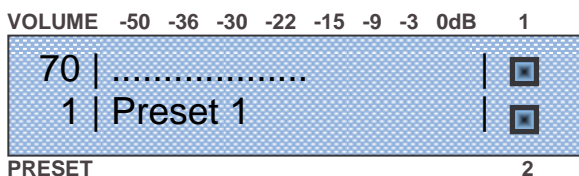
For each preset, the following 3 parameters are programmed:

- master volume
- which of the 2 outputs are to be active
- preset name.

This way the different settings are immediately distinguishable.

13.2. Changing between presets

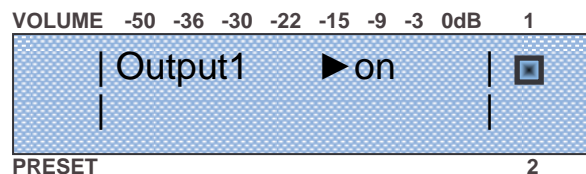
- Turn the unit on with the main on/off switch located on the front panel.
- The welcome message will appear in the display. After a few seconds, it will disappear again and the settings of the current preset will show up. Below, an example is given.



- Here one can see the current preset name (in this case „Preset 1“) as well as the value of the master volume in percent (total output volume, here 70%). The bar above the preset name is an analogue representation of the master volume.
- On the right-hand side of the display the two little squares represent the 2 outputs (the numbers 1 through 2 are written above and below the display). A dot within a square indicates, that this particular output is active.
- Please note: The preset settings can be guarded against accidental changes. In this „Vol/Preset protect“, changes can only be undertaken by pushing and turning a knob at the same time.
- In order to switch from one preset to another, push the preset knob while turning it until the desired preset shows up in the display; then let go. Now, all is set for the next application.

13.3. Temporarily changing on existing preset

- Should it become necessary to change the volume of a given preset, turning the volume knob to set the desired value. This change is only temporary, i.e. once the unit is turned off and back on again, the original preset is active again. Push the volume knob while turning it to set the desired value if the „Vol/Preset protect“ is activated.
- Should it become necessary to temporarily change the active outputs. By pushing the preset knob, the display will successively show each output. The respective name of the output will appear (in the example given below „Output1“) as well as a little square next to the corresponding number of the output. „On“ or „off“ indicate whether the output is active or not. This is also reflected in the little squares, where a dot in the middle indicates an active output.

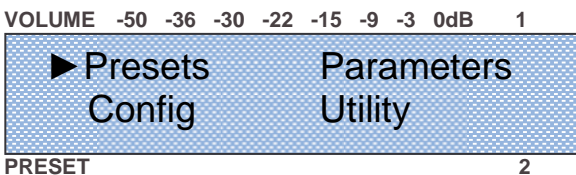


- Turning the volume knob by one click, you can change the output to „on“ (active) or „off“ (deactivated). Briefly pushing the volume knob will take you one level back, and in the display you will see the preset name again with its current settings. These changes are also temporary, i.e. will only be effective until the unit is turned off and back on again.

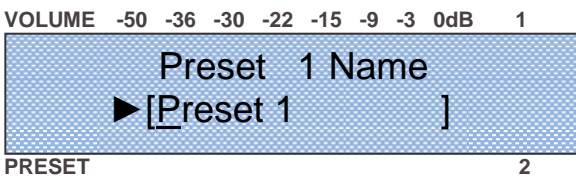
14. Extended Functions - DSP Section

14.1. Programming a new preset (or reprogramming an existing one)

- This section describes how to programme one of the 20 preset slots, i.e. give a preset name and select the desired master volume and outputs. In the same fashion, existing presets can be reprogrammed (as opposed to the temporary changes described in section 13.3.).
- First, turn the unit off with the main on/off switch in the back.
- Then, turn the unit back on, while pushing both the volume und preset knobs at the same time. Keep the knobs pushed until the parameter menu appears (see below). The four items „preset“, „parameters“, „config“, and „service“ appear.



- Briefly push the preset knob. The Edit Preset windows will appear.
- Briefly push the preset knob. The first preset will appear („Preset 1“ in case no preset name has been given so far).
- In case you wish to choose a different preset slot, briefly push the volume knob. That way you move back to the Edit Preset menu and can choose a different preset by turning the volume knob.
- A yet unused preset slot can be identified by the fact that it does not yet have given preset name, but merely „preset“ and a number (e. g. „preset 12“).
- Briefly push both knobs at the same time. Again the parameter menu shows up.
- Push the preset knob. Now you can determine the preset name. The cursor will blink under the first character.



- By turning the volume knob, the following letters, numbers, and special characters will appear in this order: A-Z, Ä, Ö, Ü, a-z, ä, ö, ü, 0-9, space, !, #, \$, %, &, ' () * +, - . /

- Pushing the preset knob will confirm the current character und move the cursor one position to the right. Now you can set the next character.
- When you've filled in the preset name, turn the preset knob one click to the right to now determine the master volume for this preset. Set the value by turning the volume knob. The values range from 0 to 100%. The corresponding value in dB is given in brackets.
- Now turn the preset knob again one click to the right in order to determine the outputs for this preset.
- When pushing the preset knob, the 2 outputs will appear one after the other with their respective names. „On“, as well as a dot in the little square, indicate that this output is active. By turning the volume knob one click, the shown output can be either activated or deactivated.
- Now the programming for this preset is complete. By pushing the volume knob, you will exit the programming mode. You will be asked whether you would like to „Save changes?“. Pushing the volume button indicates „yes“ and your changes will be saved (→ „Saving ... do not interrupt!“). Pushing the preset knob indicates „no“ and the display will show „Changes discarded!“.



The following modifications are to be performed by qualified audio technicians only.

14.2. Programming the Mixer (The parameters menu)

- Functions and settings in the parameter domain should be changed by qualified personnel only. The only exception is the programming of a new preset as described in section 14.1. .
- The digital control boasts the great advantage of the programmability of various functions. In this parameters menu, not only the presets are programmed, but among others, the equalizers and the parameters for feedback elimination are set. In fact, the entire programming of the DSP is done here with menu-driven user guidance and merely two knobs. No PC or Laptop are required.
- In order to enter the parameters menu (and therefore the programming mode), first turn the unit off.

- Then, turn it back on again while pushing both knobs (volume and preset) until the parameter menu with its four items preset, parameters, config, and utility appear.
- By turning the preset knob, you can change from one menu item to the next which is indicated by a small arrow.
- By pushing the preset knob, you choose the respective item from the menu.

14.3. General comments on programming the DSP

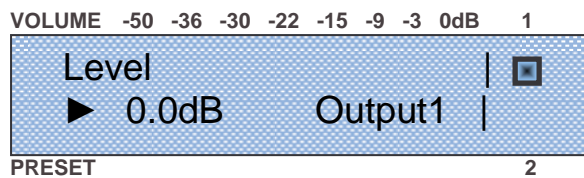
- Turning the preset knob one click to the right will always bring you to the next item of a menu, i. e. to the next parameter to be programmed. This knob is therefore also marked „parameter“. For simplicity, we will continue to name this knob the preset knob.
- Changing a value or character is always done by turning the volume knob. This knob is therefore also marked „value“. However, here too for simplicity, we will stay with the name of volume knob.
- These knobs are so-called dynamic rotary encoders, meaning that when slowly turning one of them, the value will change in small increments whereas turning a knob by the same amount more quickly will change the value superproportionally faster. This enables a fast but precise setting of the desired values.
- By pushing the volume knob, you will go up one level in the menu hierarchy. Whenever you have changed any parameter, you will be asked whether you would like to „Save changes?“. Pushing the volume button indicates „yes“ and your changes will be saved (→ „Saving ... do not interrupt“). Pushing the preset knob indicates „no“ and the display will show „Changes discarded!“.
- The following 4 sections will describe the programming possibilities of the 4 menu items. For quick reference, there is a table of all programmable settings at the end (in section 14.8.).

14.4. Presets

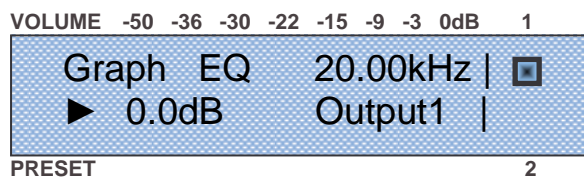
- **Preset name:** Determine the name for a given preset. The procedure is described in detail in section 14.1. .
- **Preset master volume:** Setting the master volume for a given preset.
- **Preset output:** Choose the desired outputs for a given preset. The procedure is described in detail in section 14.1..

14.5. Parameters

- Briefly push the preset knob. The Edit Parameterset windows will appear.
- Briefly push the preset knob. The first parameterset will select.
- In case you wish to choose a different parameterset slot, briefly push the volume knob. That way you move back to the Edit Parameterset menu and can choose a different preset by turning the volume knob.
- **Level:** Determine the level for each output. Set the desired value by turning the volume knob. Pushing the preset knob will bring you to the next output. With this individual level setting, you will achieve an optimal balance of the outputs which remains even when changing the master volume.



- **Delay:** It can be set in 1-meter increments and the corresponding delay time is given in milliseconds (calculated according to a speed of sound of 343 m/s, corresponding to a room temperature of 20 °C). Here, too, pushing the preset knob will move you from one output to the next.
- **Graph EQ:** Set the level of the 31 bands of the graphic equalizer for each of the 2 outputs (see picture below). By turning the preset knob, you will move to the next frequency; again by pushing it, you will move to the next output.

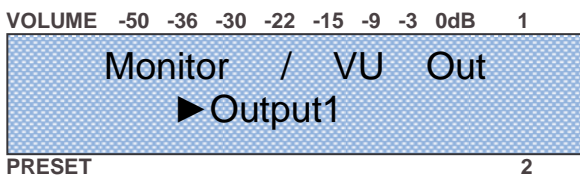


- **Param EQ 1 Freq:** Set the 1st frequency of the fully parametric equalizers (range: 20 Hz to 20.45 kHz). Here, too, the value is set with the volume knob. Pushing the preset knob will bring you to the next output, so you can set the first frequency for each output.

- **Param EQ 1 Gain:** Set the gain of the 1st band (range: +18 to -44 dB). Between +18 and -20 dB very fine 0.5 dB increments are possible.
- **Param EQ 1 Q:** Set the Q-factor for the 1st band (range: 0.2 to 100; logarithmic increments 0.2, 0.22, 0.25, 0.28, 0.32, etc.). The high Q-factors enable extremely narrow-band notch-filters for ideal feedback elimination.
- **Param EQ 2-6 Freq:** Proceed as described above for bands 2, 3,4,5 and 6.
- **Param EQ 2-6 Gain:** Proceed as described above for bands 2, 3,4,5 and 6.
- **Param EQ 2-6 Q:** Proceed as described above for bands 2, 3,4,5 and 6.
- **Limiters:** Can be individually set for each output. By pushing the preset knob, you can choose the output; turning the volume knob by one click, you can turn the limiter either „on“ or „off“.
- By pushing the volume knob you return back to the parameter menu. In case you have changed any parameters, you will be asked whether you would like to save them.

14.6. Config

- **Startup Preset:** Choose a preset that will be selected at the mixer power on by turning the volume knob.
- **Startup Parameterset:** Choose a parameterset that will be selected at the mixer power on by turning the volume knob.
- **Monitor / VU Out:** Selection of one of the 2 outputs for monitoring via VU meter in the display. By turning the volume knob, you can choose the desired output.

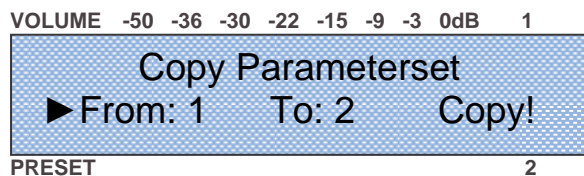


- **LCD contrast:** Set the contrast of the LCD display from 0 to 50 for an optimal readability.
- **Vol/Preset protect:** The protection of the settings is such that changes (e. g. changing between presets or temporary volume changes) can only be performed while *pushing and turning* the knobs at the same time. This is intended to safeguard the settings from accidental changes. If this protection is turned off, changes can be made by simply turning the knobs without pushing them. Turning the volume knob by one click either enables or disables the protection.

- **Welcome screen Line 1:** Set the first line (16 characters) of the welcome text that shows up when powering up the unit. The cursor will blink under the first character. By turning the volume knob, the following letters, numbers, and special characters will appear in this order: A-Z, Ä, Ö, Ü, a-z, ä, ö, ü, 0-9, space, !, ,, # \$ % & ' () * + , - . / Pushing the preset knob will confirm the current character und move the cursor one position to the right. Now you can set the next character.
- **Welcome screen Line 2:** Set the second line (16 characters) of the welcome text that shows up when powering up the unit.
- **Output 1 Name:** Determine the name of the first output. 8 characters are available for this name (e.g. nave, gallery, etc.)
- **Output 2 Name:** Determine the name of the second output. 8 characters are available for this name (e.g. nave, gallery, etc.)

14.7. Utility

- Briefly push the preset knob. The Utility menu windows will appear.
- Choose between Copy or Firmware menu by turning the volume knob.
- **Copy:** Briefly push the preset knob. The Copy menu windows will appear. Select the desired Parameterset on the right of the word „From:“ by turning the volume knob. Turning the preset knob one click to the right to be able to select the desired Parameterset on the right of the word „To:“. Select the desired Parameterset on the right of the word „To:“ by turning the volume knob. Turning the preset knob one click to the right to be able to select the Copy! Function. Briefly push the preset knob to copy the settings of the Parameterset selected on the right of the word „From:“ to the Parameterset selected on the right of the word „To:“. This Utility allows to create different Parameterset where the big quantity of parameters are the same.



- **Firmware:** Displays the current firmware version of the unit.

14.8. Quick reference: DSP menu structure

The following table lists the DSP menu with its items and parameters:

Item	Submenu	Parameter	Description
Preset	Edit Preset		Preset selection menu (1÷20)
		Preset name	Name of the preset
		Preset master volume	Master volume of the preset (-∞ ÷ +10dB)
		Preset output	Choice of active outputs
Parameters	Edit Parameterset		Parameterset selection menu (1÷4)
		Level	Level of each output (-∞ ÷ +12dB)
		Delay	Delay times for each outputs(0 ÷ 680ms 233mt)
		Graph. EQ [1st. frequency]	Level of 1 st band of the graphic equalizer; settable for each output (-44dB ÷ +18dB)
	
		Graph. EQ [31st frequency]	Level of 31 th band of the graphic equalizer; settable for each output (-44dB ÷ +18dB)
		Param. EQ 1 Freq	Frequency of the 1 st parametric equalizer; settable for each output (20Hz ÷ 20kHz)
		Param. EQ 1 Gain	Gain of the 1 st parametric equalizer; settable for each output (-44dB ÷ +18dB)
		Param . EQ 1 Q	Q-factor of the 1 st parametric equalizer; settable for each output (0,2 ÷ 100)
		... [same for the other 6 parametric equalizers]	
		Limiter on/off	Set limiter individually for each output
Config.		Startup Preset	Startup Preset selection (1÷20)
		Startup Parameterset	Startup Parameters selection (1÷4)
		Monitor / VU Out	Select output for VU meter
		LCD Contrast	Contrast of the LCD display (0÷50)
		Vol/Preset Protect	Rotary encoder protection on/off
		Welcomescreen Line 1	1 st line of welcome screen
		Welcomescreen Line 2	2 nd line of welcome screen
		Output 1 Name	Name of 1 st output
		Output 2 Name	Name of 2 nd output
Utility	Copy / Firmware		Copy or Firmware selection menu
		Copy	Parameterset copy function
		Firmware	Firmware version

15. System SetUp (Step by Step)

The inputs of the mixer can accommodate a wide range of sources including active paging stations, dynamic microphones, DVD, CD and Mp3 players and mixers.

The Direct out and Preout outputs may be used to drive power amplifiers, mixers, or mixer amplifiers. The Power output may be used to drive constant voltage or constant impedance speaker lines.

Each installation will require setting the appropriate relative mix of levels between paging, program sources and mic/line inputs for each line or amplified outputs.

Because of the variation in levels between the possible sources, the mixer offers a number of gain stage adjustments and parameter tools so you can set the correct levels for your application.

Also consider what the outputs are driving....

Setting up correct parameter structure through the whole system is important to achieve optimal results.

The following step by step procedure has been devised to assist during the setup process.

- Connect the speaker lines to the correct power output socket.
- Select the indicated input sensitivity (mic/Line) by the dipswitch (21) located on the back panel, for each input in accord with the source.

- Active the phantom supply by the dipswitch (21) located on the back panel if electret microphones are used.
- Ensure that all the Gains and Volume controls are at minimum, and that the Tone controls are flat.
- Keep the master volume for each output channel at about 10%÷20%
- Keep the input channels LEVEL (11) at about 5 (50%).
- Adjust each input channel GAIN (2) in order that the SIG (12) green led lit continuously also with low input signal and that the CLIP (13) red led lit with strong input signal.
- Adjust each input channel GATE (1) in order to avoid the noise gate activation cause background noise or undesired signal but by the speaker voice or input signal only.
- Adjust the master volume and the input channels LEVEL in order to obtain the required sound pressure.
- Optimize the room equalization and delays in order to obtain the best intelligibility by the DSP parameter tools.
- Adjust the 3 band equalizer (8,9,10) for each channel in order to obtain the best result with each different input source.

16. Configuration Example

17. Technical Specifications

MODEL	HP2150	HP2240
Configuration	7 In/2 Output Channel Amplified Mixer	7 In/2 Output Channel Amplified Mixer
Inputs	5 balanced mic/line; 2 stereo AUX	5 balanced mic/line; 2 stereo AUX
Outputs	2x150W @ 100-70-50V/4ohm	2x240W @ 100-70-50V/4ohm
Controls	3 Band EQ, Gain, Gate and Level for each input; Bass and Treble EQ and Level for AUX inputs; Master Level; Volume, Preset, Value, Parameter, Back and Enter for DSP	
AUX Input Sensitivity	+ 0 dBu 775 mV	+ 0 dBu 775 mV
CD Input Sensitivity	+ 3 dBu 1,09V	+ 3 dBu 1,09V
LINE Inputs Sensitivity	- 28 dBu 31mV	- 28 dBu 31mV
MIC inputs Sensitivity	- 58 dBu 1 mV	- 58 dBu 1 mV
Mic-balanced inputs Impedance	600 Ohm	600 Ohm
Bass control	± 12 dB at 70 Hz	± 12 dB at 70 Hz
Middle control	± 12 dB a 700 Hz	± 12 dB a 700 Hz
Treble control	± 12 dB at 10 kHz	± 12 dB at 10 kHz
REC output level	+ 0 dBu 775 mV	+ 0 dBu 775 mV
PRE OUT output level	+ 4 dBu 1,22 V	+ 4 dBu 1,22 V
Frequency response	80-15.000 Hz	80-15.000 Hz
Rating power distortion @ 1 KHz	< 1%	< 1%
SN Ratio Line	> 84dB	> 84dB
E.I.N. MIC (20Hz÷20kHz weighted)	126 dBV	126 dBV
DSP ADC / DAC Resolution and Sampling Rate	24 bit, 96 kHz	24 bit, 96 kHz
DSP internal accuracy	48 bit, entire data path	48 bit, entire data path
DSP audio clock frequency	96 kHz, entire data path (thus, EQs are very precise at high frequencies)	96 kHz, entire data path (thus, EQs are very precise at high frequencies)
DSP internal overload reserve	48 dB (renders a DSP internal overload in conventional applications virtually impossible)	48 dB (renders a DSP internal overload in conventional applications virtually impossible)
Power Requirements	AC 230V-50÷60Hz	AC 230V-50÷60Hz
Consumption (1/8 power program)	95VA	140VA
Dimensions (WxHxD)	482x88x340mm	482x88x340mm
Weight - Net	7,1kg	8,6kg
Optional	C656-RJ remote control card; C714 Din-Don tone card	

XTE Electronic reserve the right to make changes to the drawings and specifications at any time and without notice.

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