

User's Manual

EQU Series

15/31 Band Graphic Equalizer



www.altoproaudio.com

Version 1.0 April 2002

— English —

SAFETY RELATED SYMBOLS



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure-voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.



Protective grounding terminal.



Alternating current /voltage.



Hazardous live terminal.

ON: Denotes the apparatus turns on.

OFF: Denotes the apparatus turns off, because of using the single pole switch, be sure to unplug the AC power to prevent any electric shock before you proceed your service.

WARNING: Describes precautions that should be observed to prevent the danger of injury or death to the user.

CAUTION: Describes precautions that should be observed to prevent danger of the apparatus.

WARNING

• Power Supply

Ensure the source voltage matches the voltage of the power supply before turning ON the apparatus. Unplug this apparatus during lightning storms or when unused for long periods of time.

• External Connection

The external wiring connected to the output hazardous live terminals requires installation by an instructed person, or the use of ready-made leads or cords.

• Do not Remove any Cover

There are maybe some areas with high voltages inside, to reduce the risk of electric shock, do not remove any cover if the power supply is connected. The cover should be removed by the qualified personnel only.

No user serviceable parts inside.

• Fuse

To prevent a fire, make sure to use fuses with specified standard (current, voltage, type). Do not use a different fuse or short circuit the fuse holder.

Before replacing the fuse, turn OFF the apparatus and disconnected the power source.

• Protective Grounding

Make sure to connect the protective grounding to prevent any electric shock before turning ON the apparatus. Never cut off the internal or external protective grounding

wire or disconnect the wiring of protective grounding terminal.

• Operating Conditions

This apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on this apparatus. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Do not use this apparatus near water.

Install in accordance with the manufacturer's instructions. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not block any ventilation openings.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Follow all instructions.
- Keep these instructions.
- Heed all warnings.
- Only use attachments/accessories specified by the manufacturer.

• Power Cord and Plug

Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

• Cleaning

When the apparatus needs a cleaning, you can blow off dust from the apparatus with a blower or clean with rag etc. Don't use solvents such as benzol, alcohol, or other fluids with very strong volatility and flammability for cleaning the apparatus body.

Clean only with dry cloth.

• Servicing

Refer all servicing to qualified personnel. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Preface

Dear Customer:

Thanks for choosing ▲LTO Graphic Equalizer and thanks for choosing one of the results of ▲LTO AUDIO TEAM job and researches.

For our ▲LTO AUDIO TEAM, music and sound are more than a job...are first of all passion and let us say...our obsession!

We have been designing professional audio products for a long time in cooperation with some of the major brands in the world in the audio field.

The ▲LTO line presents unparalleled analogue and digital products made by Musicians for Musicians in our R&D Centres in Italy, Netherlands, United Kingdom and Taiwan. The core of our digital audio products is a sophisticated DSP (Digital sound processor) and a large range of state of the art algorithms which have been developed by our Software Team for the last 7 years.

Because we are convinced you are the most important member of ▲LTO AUDIO TEAM and the one confirming the quality of our job, we would like to share with you our work and our dreams, pay attention to your suggestions and your comments.

Following this idea we create our products and we will create the new ones! From our side, we guarantee you and we will guarantee you also in future the best quality, and the best fruits of our continuous researches and the best prices.

Our ▲LTO Graphic Equalizer is the result of many hours of listening and tests involving common people, area experts, musicians and technicians.

The results of this effort is a high-end Graphic Equalizer which will provide a permanent precise equalization to the musician, performer, studio engineer and sound contractor .

Nothing else to add, but that we would like to thank all the people that made the ▲LTO Graphic Equalizer a reality available to our customers, thank our designers and all ▲LTO staff, there to make possible the realization of products containing our idea of music and sound and there to support you, our customers, in the best way, conscious that you are our best richness.

Thank you very much.

▲LTO AUDIO TEAM

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1. INTRODUCTION

Thank you very much for expressing your confidence in ▲LTO products by purchasing our EQU Series Graphic Equalizers. With the EQU Series you have acquired an extremely musical and flexible Graphic Equalizer.

The high-end EQU Series are based on many years of experience and are designed to provide a permanent precise equalization to the musician, performer, studio engineer and sound contractor. The EQU Series can be used wherever is requested to modify the frequency " contour " of a sound and can offer a solution to many common sound problems and allows the user to use the creativity to obtain nice results in terms of sound characterization.

EQU Series Graphic Equalizers include the following seven models:

EQU131 - Graphic Mono 31 Band Equalizer

EQU215 - Graphic Stereo 15 Band Equalizer

EQU2215 - Graphic Stereo 15 Band Equalizer

EQU131VU - Graphic Mono 31 Band Equalizer / VU Meter*1

EQU231VU - Graphic Stereo 31 Band Equalizer / VU Meter*2

EQU231LED - Graphic Stereo 31 Band Equalizer / LED Display*2

EQU231TWIN - Graphic Stereo 31Band Equalizer /LED Display*2

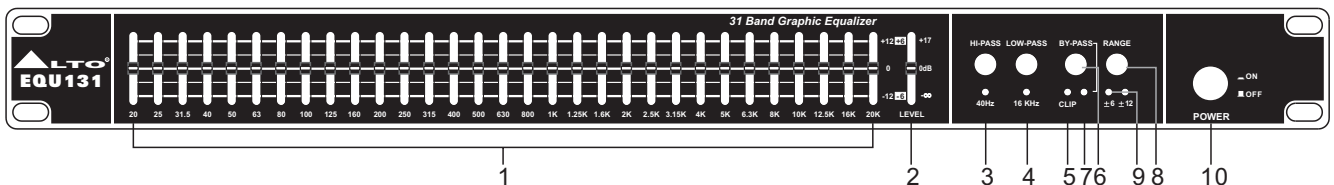
2. FEATURE LIST

- Easy to Operate Front Panel Controls
- Constant Q circuitry with a 3% center frequency accuracy
- Control range $\pm 6\text{dB}$ / $\pm 12\text{dB}$ selectable
- Active balanced and unbalanced input and output connectors
- Variable input level control
- Signal clip pilot
- Ground "LIFT" switch to disconnect signal ground from chassis ground
- Power off automatic bypass function
- Line voltage selectable
- Robust and Compact design
- Intended for installation in standard 19" rack space
- Manufactured Under ISO9001 Certified management system

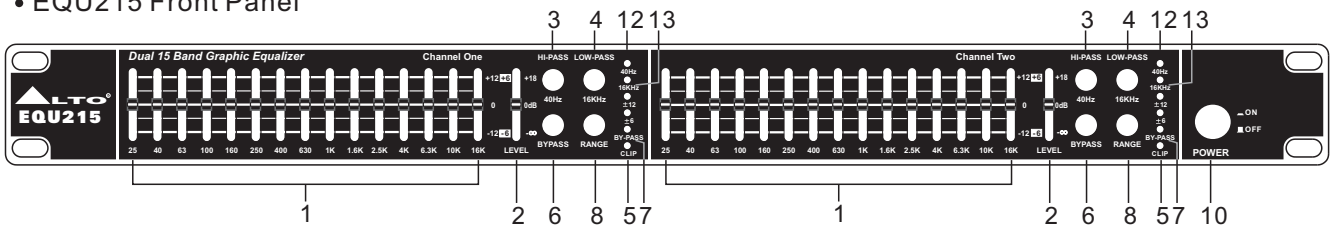
3. CONTROL ELEMENTS

3.1 The Front Panel

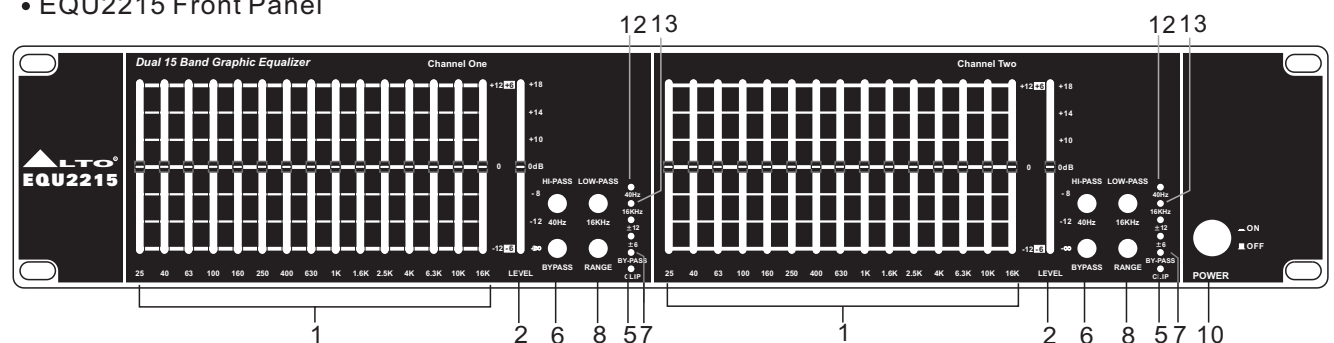
- EQU131 Front Panel



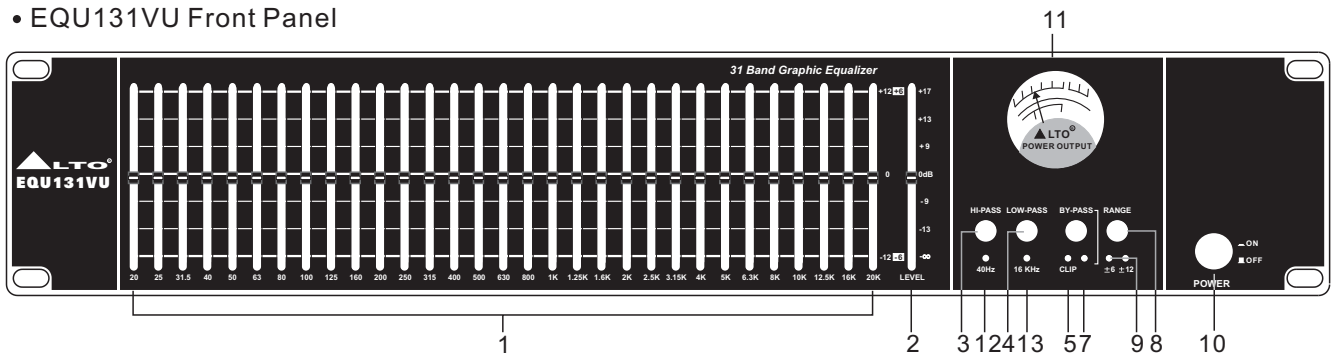
- EQU215 Front Panel



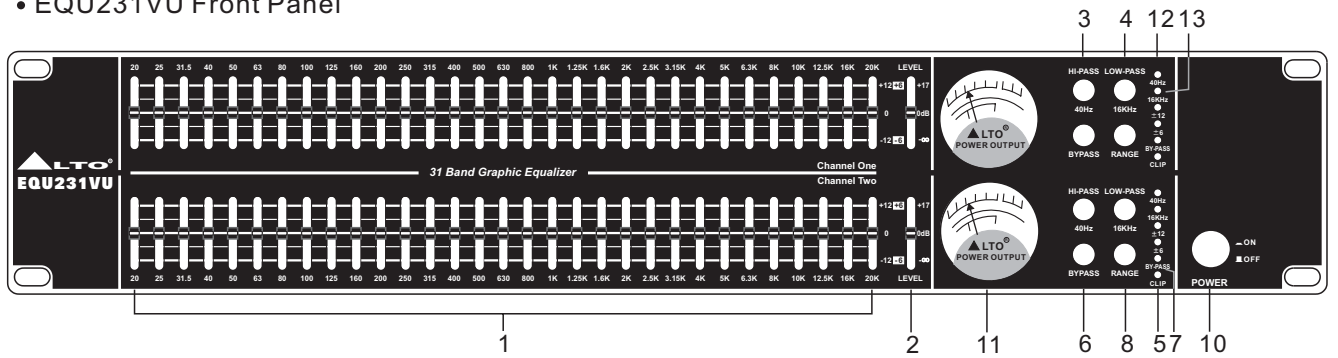
- EQU2215 Front Panel



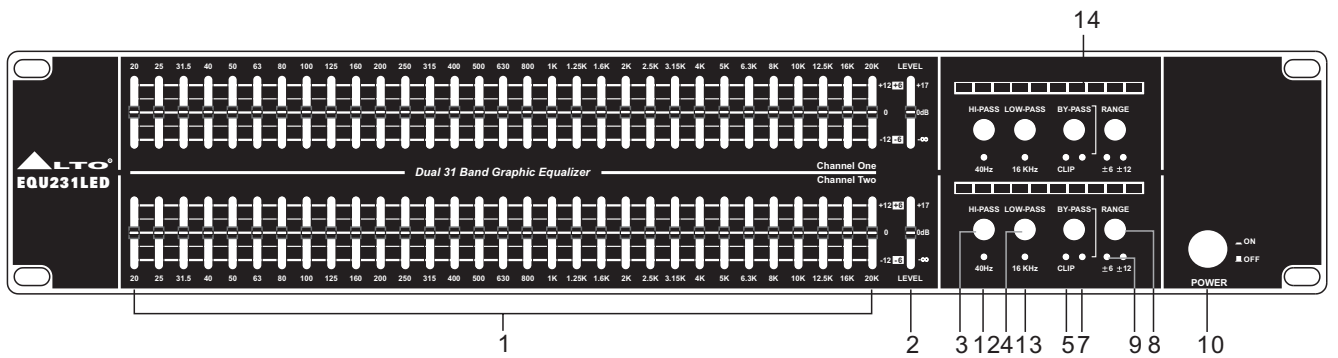
• EQU131VU Front Panel



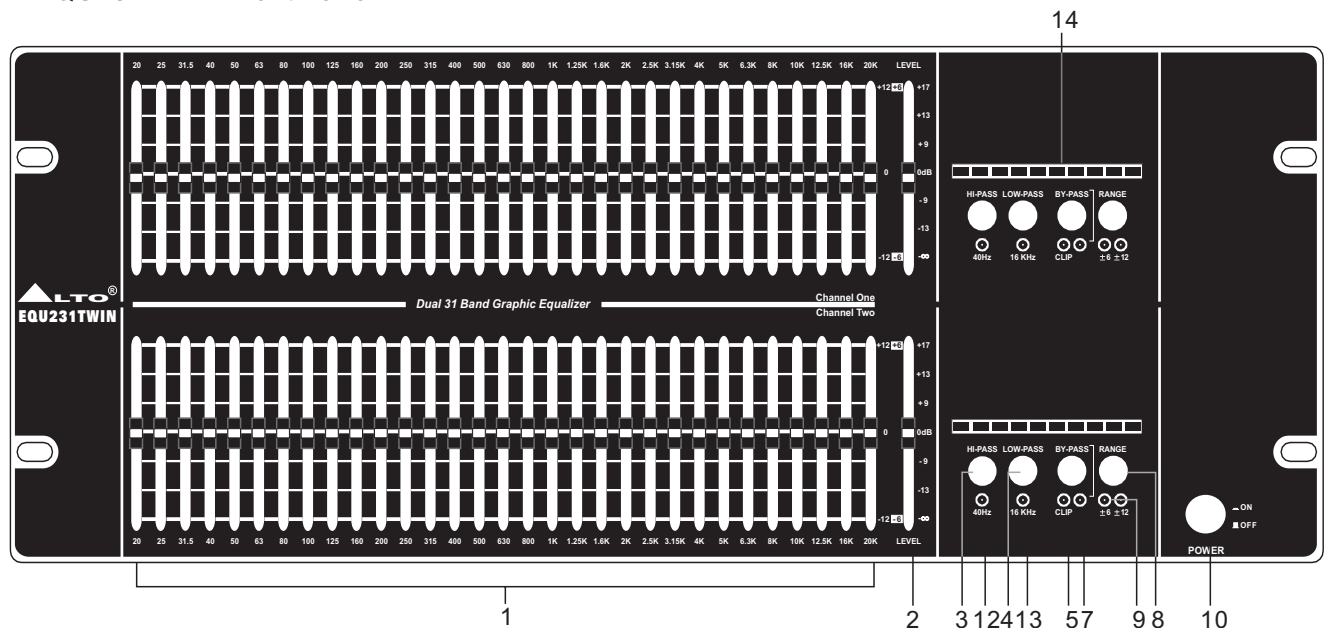
• EQU231VU Front Panel



• EQU231LED Front Panel



• EQU231TWIN Front Panel



1. Filter level controls

Each one of these linear potentiometers will boost or attenuate (either $\pm 6\text{dB}$ or $\pm 12\text{dB}$) the selected frequency at a preset bandwidth.

When all the sliders are in the centre position, the output of the equalizer is flat response.

2. Level control

This control sets the input signal level to the equalizer. Its "0dB" position is unity gain (no boost or attenuation). If the clip LED(5) is light continuously, turndown this control until it only flickers occasionally.

3. High pass filter

This button electronically inserts a filter into the signal path, which cuts the low frequencies at 40Hz (12dB per octave). The LED (12) indicator lights when the button is pressed and this filter is serving in the circuit.

4. Low pass filter

This button electronically inserts a filter into the signal path, which cuts the high frequencies at 16KHz (12dB per octave). The LED (13) indicator lights when the button is pressed and this filter is serving in the circuit.

5. Clip LED

This LED will light when any section of the equalizer is within 5 dB of clipping. Occasional flickering of this clip LED is acceptable, but if it remains on continuously, you should turn down the level control or reduce the output level of the preceding component to avoid audible distortion.

6. Bypass switch

This switch inserts or removes the equalizer channel path. If bypass, the bypass LED(7) will be illuminated to indicate it is in bypass mode. When bypassed, the input signal is routed directly to the output jacks. When power loss, the unit automatic bypassed.

7. Bypass LED

When this LED lights, it is in bypass mode.

8. Range switch

This button switches the gain range of the filter potentiometer between ± 6 dB and ± 12 dB.

9. Filter range indicator

When the ± 6 dB range is selected, green LED will light. When the ± 12 dB range is selected, red LED will light.

10. Power switch

This is used to switch the equalizer on and off. The appliance would be turned on when the power switch to be set to the on-position, and it would be turned off when the switch be set to the off-position.

11. VU meter

This VU meter is used to indicate the output level.

12. High pass LED

When the High pass filter(40Hz/12dB) is in active, this LED will light.

13. Low pass LED

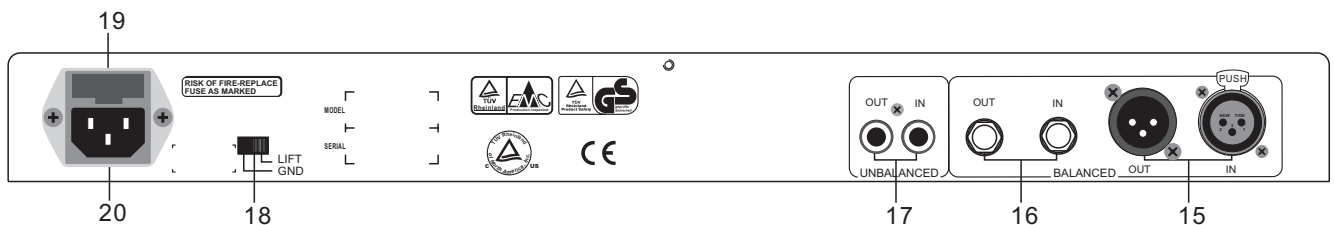
When the Low pass filter(16KHz/12dB) is in active, this LED will light.

14. Output level meter

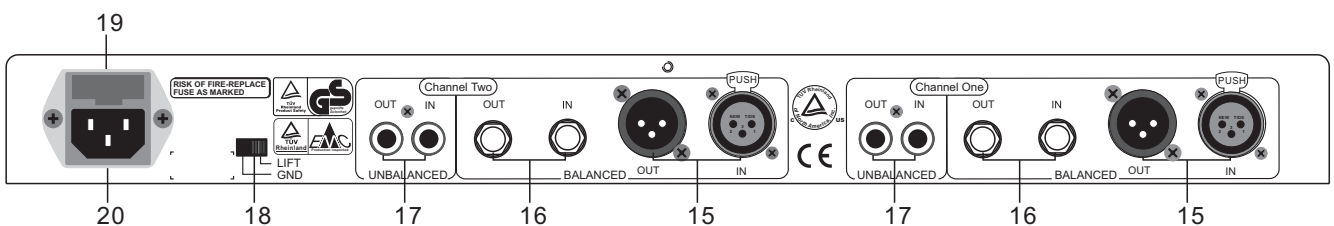
This output level meter is used to indicate the output level.

3.2 The Rear Panel

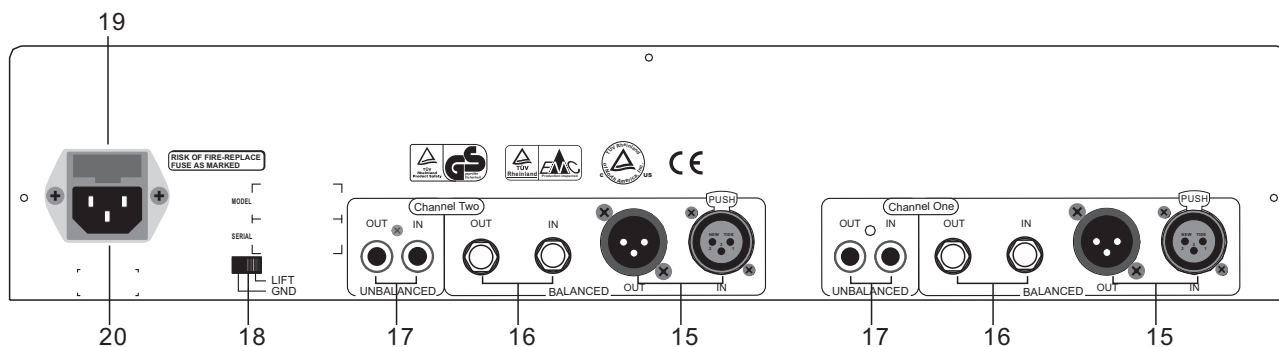
• EQU131 Rear Panel



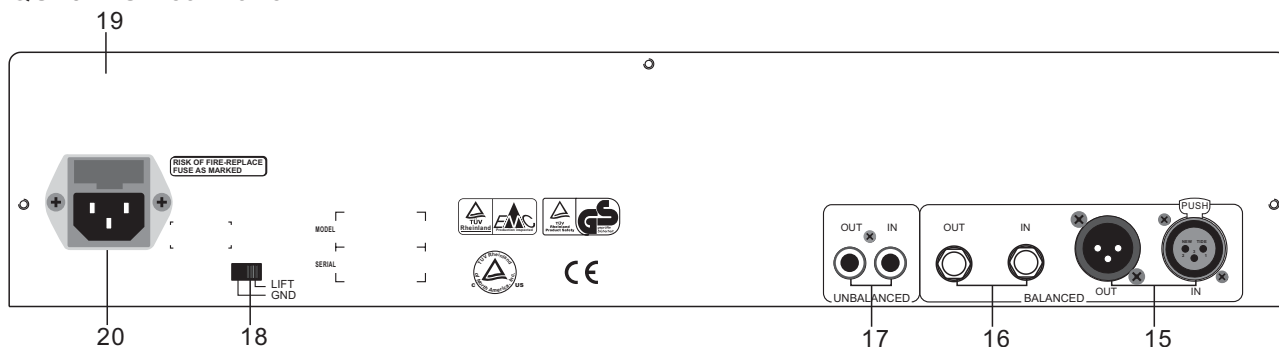
• EQU215 Rear Panel



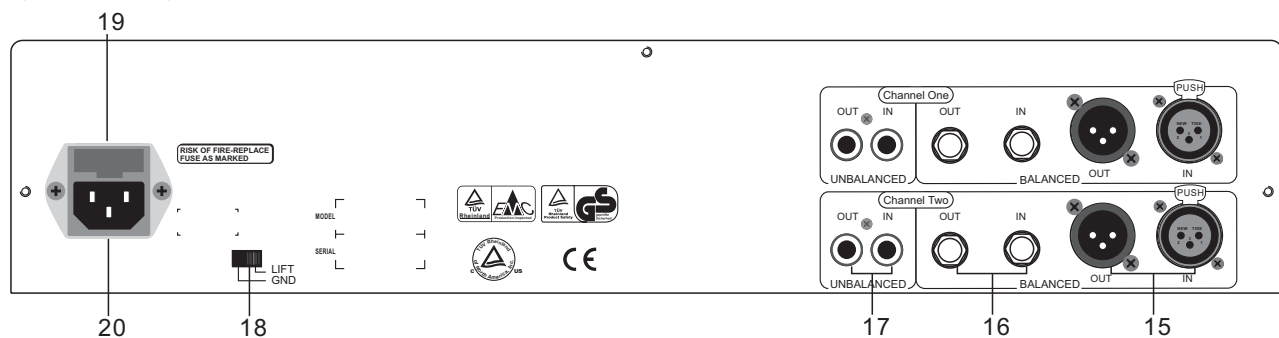
- EQU2215 Rear Panel



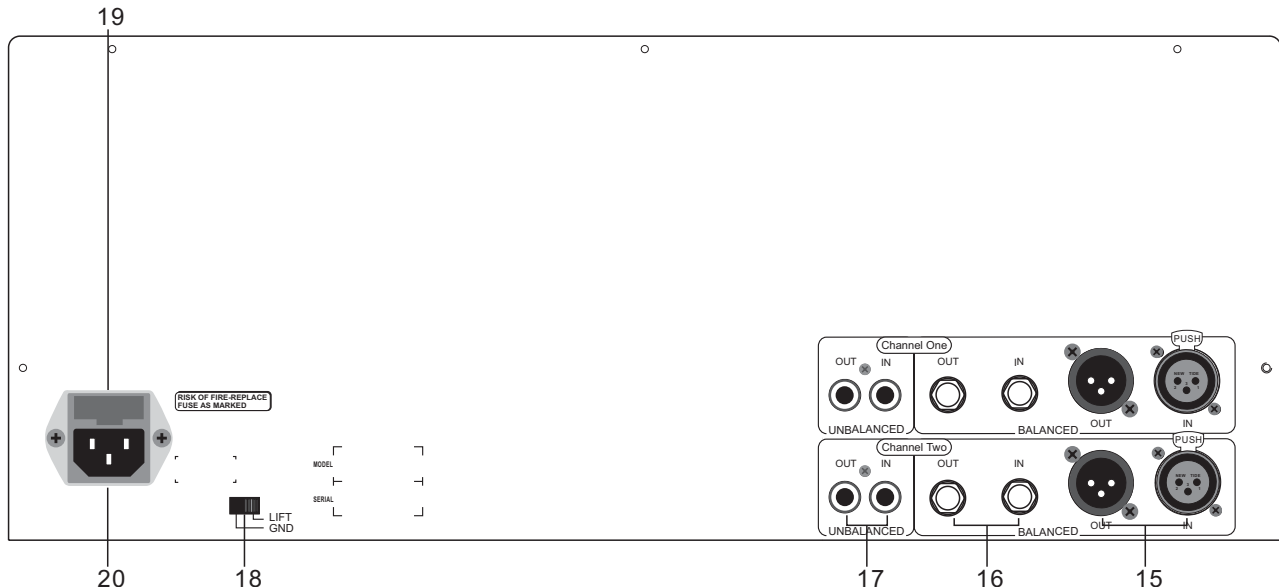
- EQU131VU Rear Panel



- EQU231VU/EQU231LED Rear Panel



- EQU231TWIN Rear Panel



15. XLR input and output connector

The XLR connector are actively balanced and are used to input/output the signal.

16. 1/4" TRS phone plug input and output connector

The 1/4" TRS connector are actively balanced and are used to input/output the signal.

17. RCA input and output connector

The RCA connector are unbalanced.

NOTE : While you can use any input connector with any output connector, only one set of these connectors is to be used at one time, detail wiring and connection, please refer to 4.2 audio connection.

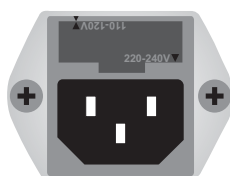
18. Ground lift switch

This switch is used to disconnect the signal ground from the mains and chassis earth. If it is determined that the equalizer is the cause of hum or buzz in your system due to a ground loop, move this switch to the "lift" position.

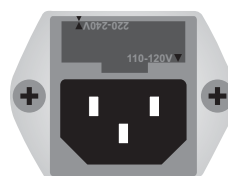
19. Fuse holder / Voltage selector

This is a dual voltage unit. Before you attempt to connect and operate the unit, please make sure that your local voltage matches the voltage on the fuse-holder cover.

Caution: The fuse protecting the AC supplies circuits of this unit. The fuse can only be changed by a qualified technician, in the event of a fault or changing the supply voltage. If the fuse continues to blow after replacing, discontinue use of this unit before repaired.



THIS IS SET FOR
110V AC TO 120V
AC OPERATION



THIS IS SET FOR
220V AC TO 240V
AC OPERATION

The fuse-holder above the AC connector on the rear of the chassis has 3 triangular markers (please refer to the above pictures), with two of these triangles opposing each other, your unit is set to the operating voltage printed next to these markers.

To change, pull fuse-holder out and rotate 180°, then push in again.

20. AC Inlet

This connector is meant for the connection of the supplied main cord.

Do not insert power cable into unit until voltage has been correctly set. Do not plug power cable into AC power until voltage has been correctly set.

4. INSTALLATION & CONNECTION

4.1 Mains Connection

Please ensure that the EQU Series Graphic Equalizer is set to the correct supply voltage before plugging the power cord into the wall outlet, use the same fuse as marked on the fuse holder at the AC power connection socket.

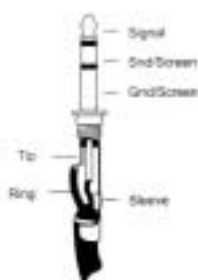
The mains connection of the EQU Series Graphic Equalizer is made by using the enclosed mains cable and a standard IEC receptacle. It meets all of the international safety certification requirements.

4.2 Audio Connection

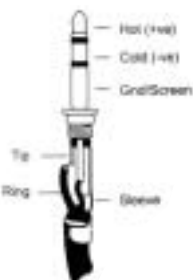
The EQU Series Graphic Equalizer presents with balanced XLR & 1/4" TRS and unbalanced RCA connectors, and it can be interfaced by several ways to support a variety of applications without any signal loss. The EQU Series Graphic Equalizer can be used on a single instrument by connecting to a mixing console's main inserts, or on an entire mix "in-line" between a mixing console's outputs and a power amplifier.

- Wiring Configuration

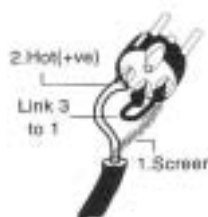
Either the 1/4" TRS phone jack or the XLR connector can be wired in balanced and unbalanced modes, which will be determined by the actual application status, please wire your system as the following wiring examples:



1/4" TRS jack
Unbalanced Input



1/4" TRS jack
Balanced Input



XLR Unbalanced Input

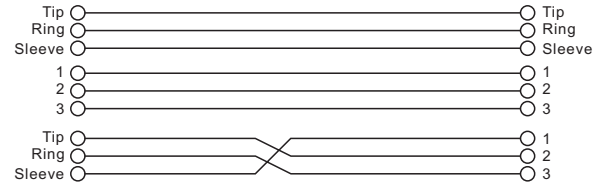
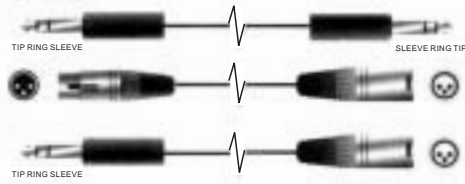


XLR Balanced Input

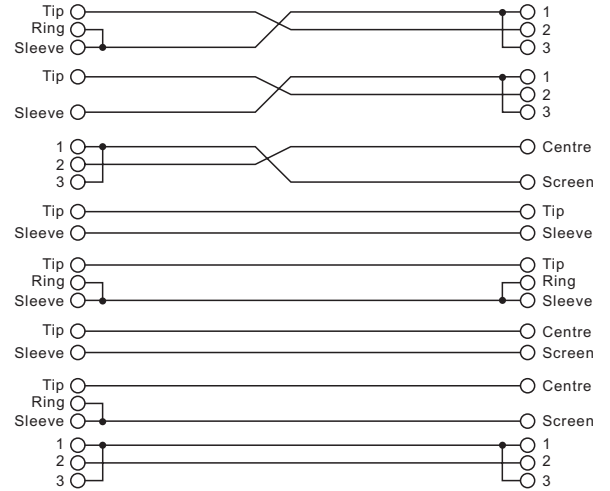
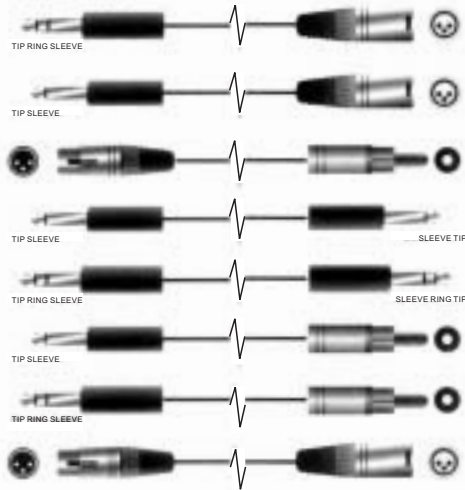
- In Line Connection

For these applications the EQU Series Graphic Equalizer provides 1/4" TRS connectors, XLR connectors and RCA connectors to easily interface with most any professional audio device. Follow the configuration examples below for your particular connection.

• Balanced



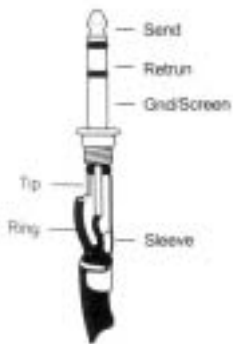
• Unbalanced



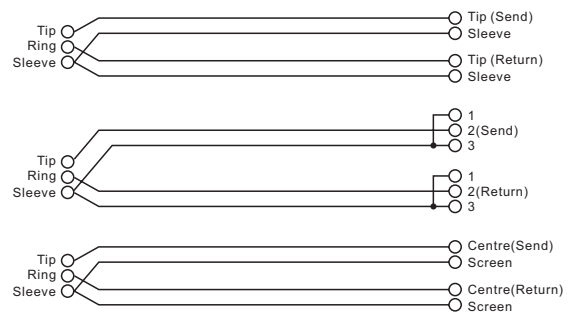
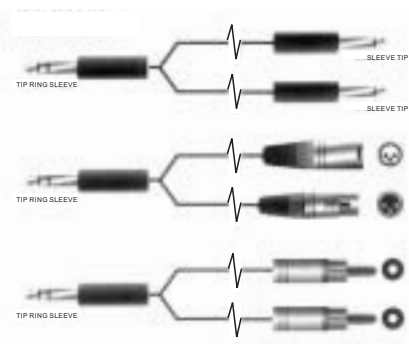
- Insert Points Connection

If you are connecting to a mixing console's main inserts, you may have a single TRS jack for SEND & RETURN, in this case, use an insert "Y" cable that configured like the examples below.

1/4" TRS insert



Insert Leads



4.3. Rack Mounting

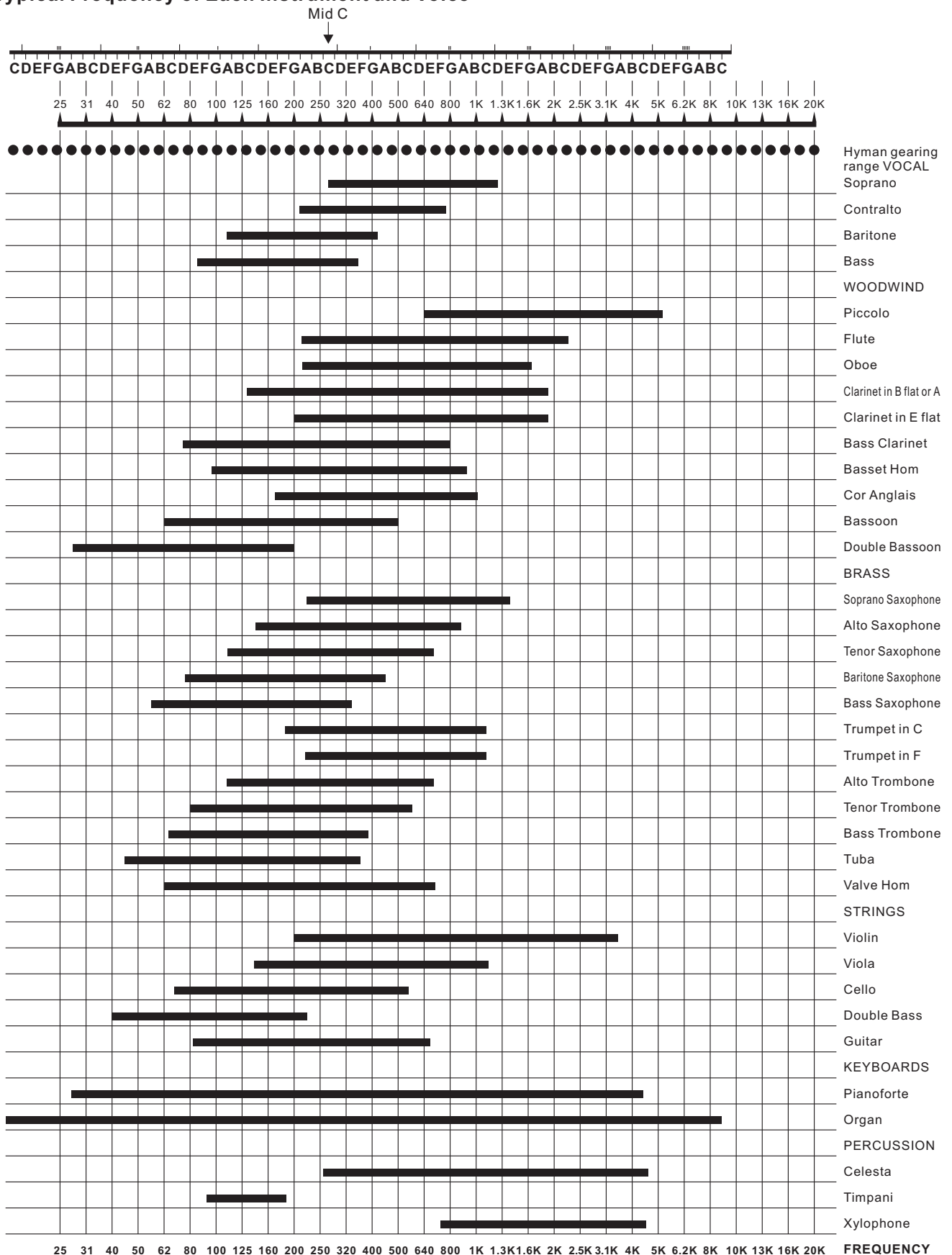
The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The EQU Series fits into one standard 19" rack unit of space, but the EQU131 and EQU215 will be 1H height, the EQU231TWIN will be 4H height, while the other four models: EQU2215, EQU131VU, EQU231VU and EQU231LED will be 2H height. Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the EQU Series on high temperature devices such as power amplifiers etc. to avoid overheating.

5. APPLICATION

5.1 The Sound Frequency

In recording studios as well as stage or radio plays, the EQU Series Graphic Equalizer will be your valuable sound tool to modify the frequency "contour" of a sound .but first of all , you should clarify the typical frequency of each instrument and voice, so that can you obtain nice results in terms of sound characterization. The tables on the following pages give you an idea of specific frequencies and their acoustic significance.

Typical Frequency of Each Instrument and Voice



5.2 Equalizer In Sound Reinforcement Systems

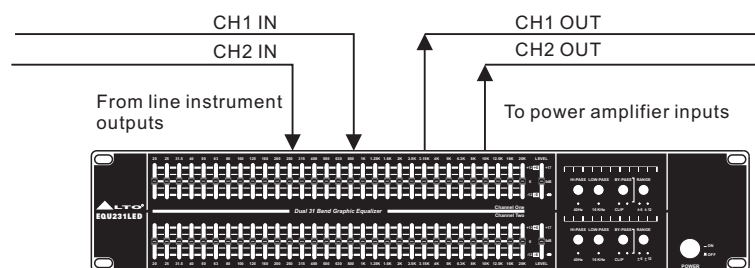
The EQU Series Graphic Equalizers can be used in the sound reinforcement systems to :

- Eliminate unwanted sounds, such as the 60Hz Hum noise.
- Shape the sound by changing the frequency response of the track.
- Special effects like telephone sounds are done by cutting off the low end to 200Hz and the high end to 6KHz.
- Allow you to modify the sound of the instrument if put EQU Series Equalizer in line with a musical instrument. you can brighten the sound, and body to a thin sounding instrument, or you can give the sound a totally different character.
- Fix a track that does not sound quite right, put the EQU Series Equalizer in an effects send and return it to the mix bus.

The following connection is probably most common field of application:

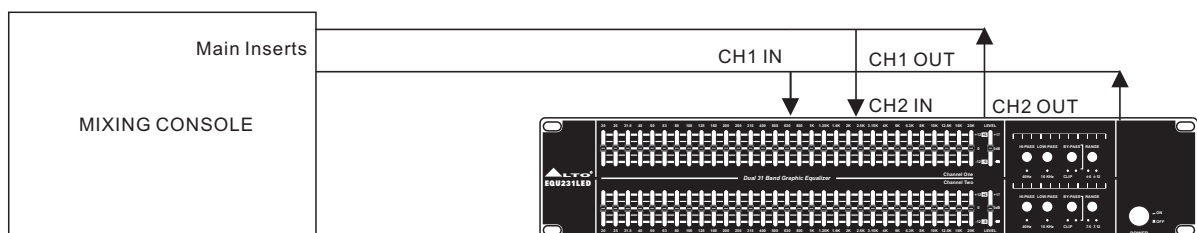
- Line Instrument

The EQU Series Graphic Equalizer can be used on an entire mix "In-line" between a instrument outputs and a power amplifier, and this is the basic application in the PA system to offer precise Equalization control.



- Mixing Console

The EQU Series Graphic Equalizer can also be used on a single instrument by connecting to a mixing console's main inserts, esp for those consoles without built-in equalization circuitry.



NOTE: Mono/Stereo Application

- a. For mono application, please use the EQU131, EQU131VU mono Graphic Equalizer.
- b. For stereo application, please use the EQU215, EQU2215, EQU231LED, EQU231VU or EQU231TWIN stereo Graphic Equalizer, either of the two channels can be used as L/R input & output.

6. TECHNICAL SPECIFICATIONS

Type	
EQU131	1×31 Band: 1/3 octave , ISO spacing (1H series)
EQU215	2×15 Band: 2/3 octave , ISO spacing (1H series)
EQU2215	2×15 Band: 2/3 octave , ISO spacing (2H series)
EQU131VU	1×31 Band: 1/3 octave , ISO spacing (2H series)
EQU231VU / 231LED	2×31 Band: 1/3 octave , ISO spacing (2H series)
EQU231TWIN	2×31 Band: 1/3 octave , ISO spacing (4H series)
Slider travel	20mm with positive centre detente (EQU131/EQU215/EQU231VU/EQU231LED) 60mm with positive centre detente (EQU131VU/EQU2215/EQU231TWIN)
Range	±6dB or ±12dB selectable
Input connections	Active balanced XLR and 1/4" TRS Unbalanced RCA
Input impedance	20kΩ (bal.) 15kΩ (unbal.)
Maximum input level	18dBv
Output connections	Active balanced XLR and 1/4" TRS Unbalanced RCA
Output impedance	< 600Ω
Maximum output level	16dBv
Load impedance	> 10KΩ
High pass filter	40Hz (12dB/oct) fixed-button type .
Low pass filter	16KHz (12dB/oct) fixed-button type
Frequency response	20Hz to 50KHz at - 3dB
THD + N %	0.02% ↓ (@ 1KHz , all VR at middle position)
S / N ratio	93dB (@ 1KHz)
Power supply	110V-120VAC -60Hz 220V-240VAC -50Hz
Consumption	
EQU131/131VU	1×31 band, 1/3 octave, ISO spacing: 7W
EQU215/2215	2×15 band, 2/3 octave, ISO spacing: 9W
EQU231VU / 231LED/231TWIN	2×31 band, 1/3 octave, ISO spacing: 12.5W
Dimensions	483(W)×220(D)×44(H)(19"×8.66"×1.7")mm (1H series) 483(W)×220(D)×88(H)(19"×8.66"×3.5") mm (2H series) 483(W)×220(D)×177.8(H)(19"×8.66"×7") mm (4H series)

7. WARRANTY

1. WARRANTY REGISTRATION CARD

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.

All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to purport a more effective and efficient after-sales warranty service. Please fill out all the information carefully and genuinely, miswriting or absence of this card will void your warranty service.

2. RETURN NOTICE

- 2.1 In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.
- 2.2 Please provide a copy of your sales receipt or other proof of purchase with the returned machine ,and give detail information about your return address and contact telephone number .
- 2.3 A brief description of the defect will be appreciated.
- 2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

3. TERMS AND CONDITIONS

- 3.1 ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.
- 3.2 The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.
- 3.3 During the warranty service,▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.
- 3.4 This warranty does not apply to the damages to this product that occurred as the following conditions:
 - Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
 - Normal tear and wear.
 - The product has been altered or modified in any way.
 - Damage which may have been caused either directly or indirectly by another product / force / etc
 - Abnormal service or repairing by anyone other than the qualified personnel or technician.And in such cases, all the expenses will be charged to the buyer.
- 3.5 In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.
- 3.6 This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.

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