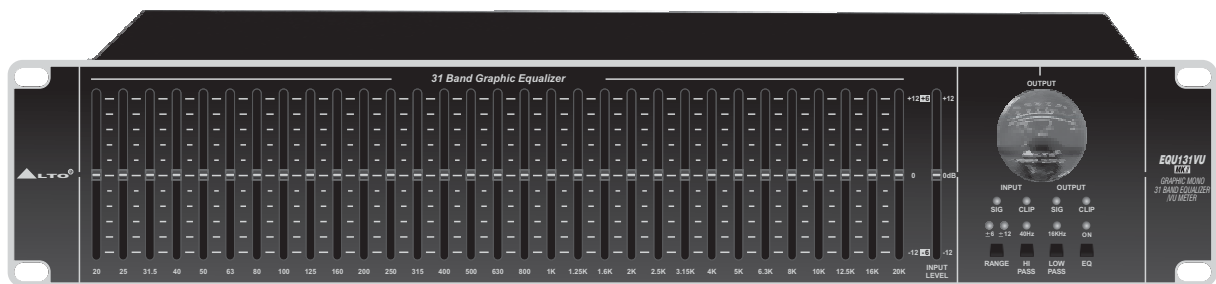


User's Manual

EQU MK II Series

15/31 Band
Graphic Equalizer



www.altoproaudio.com

Version 1.3 April 2005

— English —

SAFETY RELATED SYMBOLS



This symbol, wherever used, alerts you to the presence of un-insulated and dangerous voltages within the product enclosure. These are voltages that may be sufficient to constitute the risk of electric shock or death.



This symbol, wherever used, alerts you to important operating and maintenance instructions. Please read.



Protective Ground Terminal



AC mains (Alternating Current)



Hazardous Live Terminal

ON: Denotes the product is turned on.

OFF: Denotes the product is turned off.

WARNING

Describes precautions that should be observed to prevent the possibility of death or injury to the user.

CAUTION

Describes precautions that should be observed to prevent damage to the product.

WARNING

• Power Supply

Ensure that the mains source voltage (AC outlet) matches the voltage rating of the product. Failure to do so could result in damage to the product and possibly the user.

Unplug the product before electrical storms occur and when unused for long periods of time to reduce the risk of electric shock or fire.

• External Connection

Always use proper ready-made insulated mains cabling (power cord). Failure to do so could result in shock/death or fire. If in doubt, seek advice from a registered electrician.

• Do Not Remove Any Covers

Within the product are areas where high voltages may present. To reduce the risk of electric shock do not remove any covers unless the AC mains power cord is removed.

Covers should be removed by qualified service personnel only.

No user serviceable parts inside.

• Fuse

To prevent fire and damage to the product, use only

the recommended fuse type as indicated in this manual. Do not short-circuit the fuse holder. Before replacing the fuse, make sure that the product is OFF and disconnected from the AC outlet.

• Protective Ground

Before turning the product ON, make sure that it is connected to Ground. This is to prevent the risk of electric shock.

Never cut internal or external Ground wires. Likewise, never remove Ground wiring from the Protective Ground Terminal.

• Operating Conditions

Always install in accordance with the manufacturer's instructions.

To avoid the risk of electric shock and damage, do not subject this product to any liquid/rain or moisture. Do not use this product when in close proximity to water.

Do not install this product near any direct heat source.

Do not block areas of ventilation. Failure to do so could result in fire.

Keep product away from naked flames.

IMPORTANT SAFETY INSTRUCTIONS

Read these instructions

Follow all instructions

Keep these instructions. Do not discard.

Heed all warnings.

Only use attachments/accessories specified by the manufacturer.

• Power Cord and Plug

Do not tamper with the power cord or plug. These are designed for your safety.

Do not remove Ground connections!

If the plug does not fit your AC outlet seek advice from a qualified electrician.

Protect the power cord and plug from any physical stress to avoid risk of electric shock.

Do not place heavy objects on the power cord. This could cause electric shock or fire.

• Cleaning

When required, either blow off dust from the product or use a dry cloth.

Do not use any solvents such as Benzol or Alcohol. For safety, keep product clean and free from dust.

• Servicing

Refer all servicing to qualified service personnel only. Do not perform any servicing other than those instructions contained within the User's Manual.

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 MKII Series Graphic Equalizers. With the EQU you have acquired an extremely musical and flexible Graphic Equalizer.

The high-end EQU MKII Series Graphic Equalizers 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 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-MKII - Graphic Mono 31 Band Equalizer

EQU215-MKII - Graphic Stereo 15 Band Equalizer

EQU215TWIN-MKII - Graphic Stereo 15 Band Equalizer

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

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

EQU231-MKII - Graphic Stereo 31 Band Equalizer

EQU231TWIN-MKII - Graphic Stereo 31 Band Equalizer

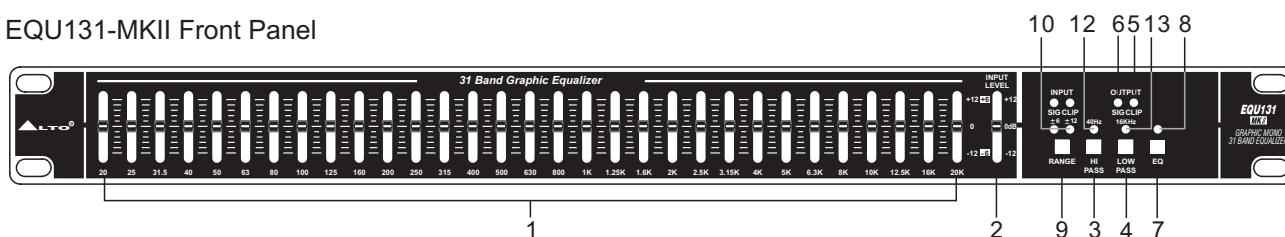
2. FEATURE LIST

- 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 QS9000, VDA6.1 certified management system

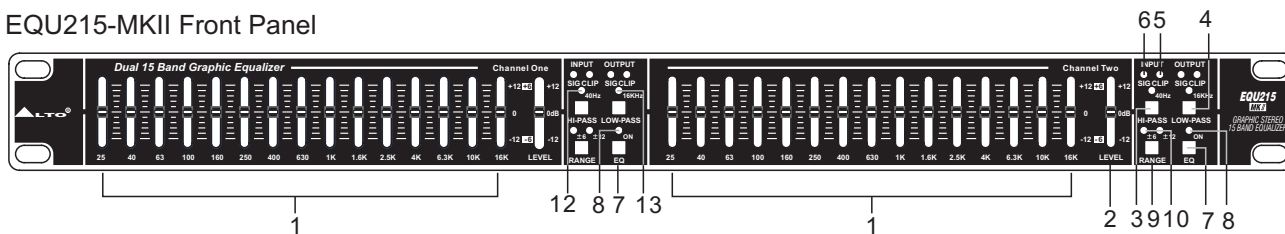
3. CONTROL ELEMENTS

3.1 The Front Panel

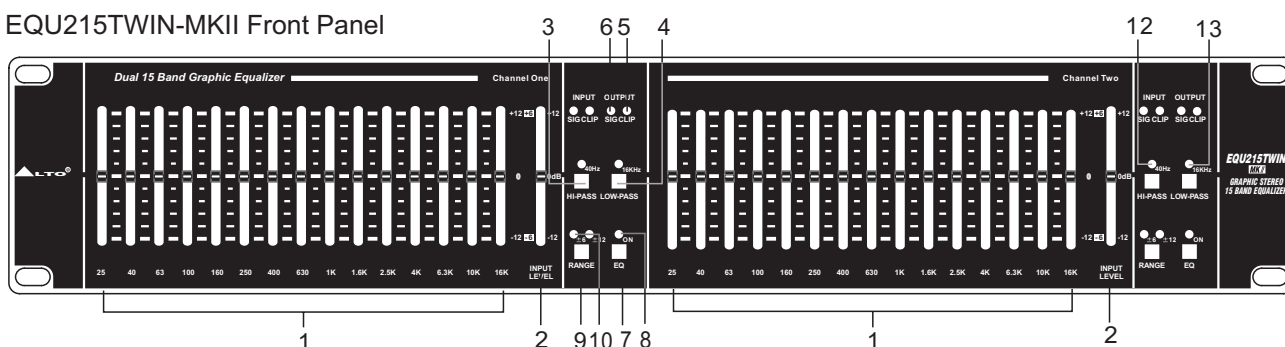
- EQU131-MKII Front Panel



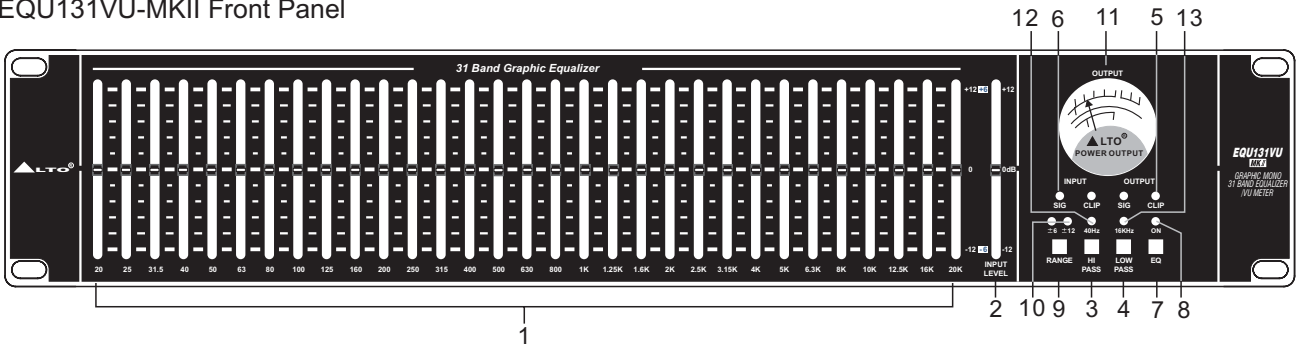
- EQU215-MKII Front Panel



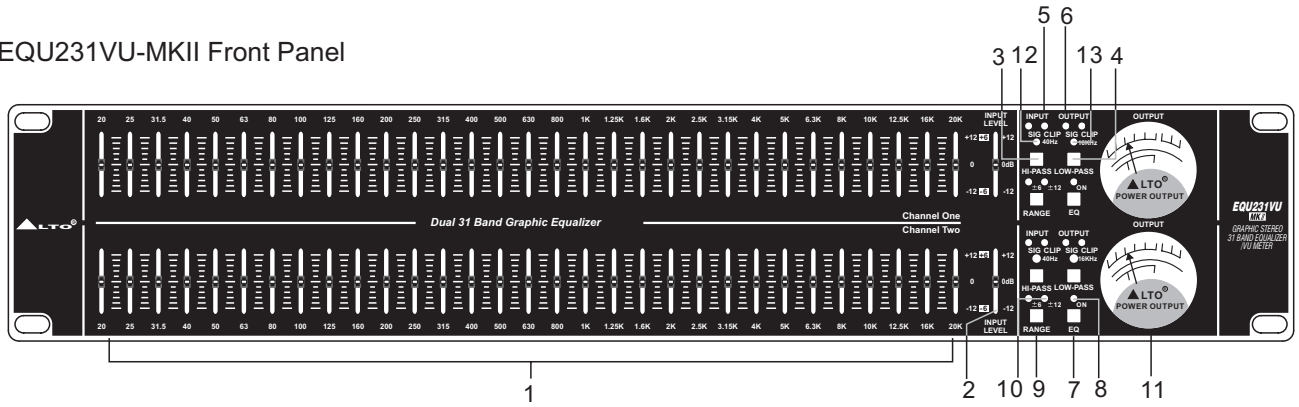
- EQU215TWIN-MKII Front Panel



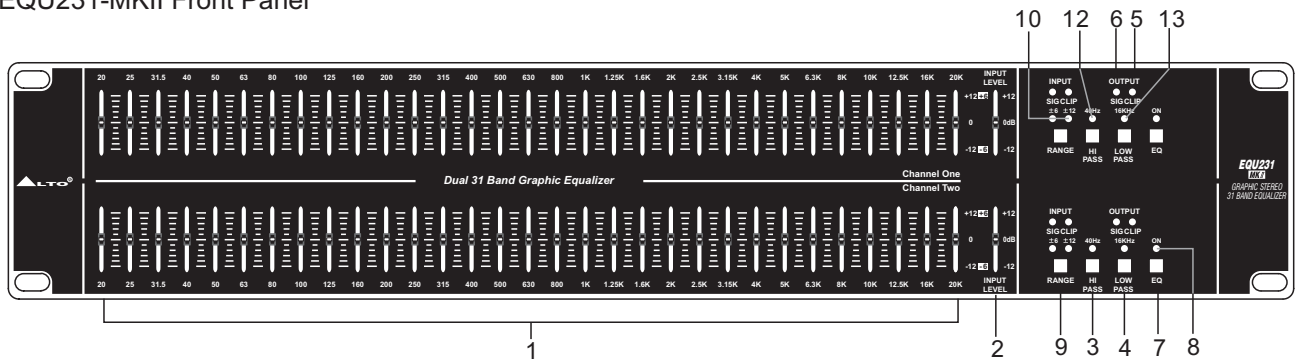
• EQU131VU-MKII Front Panel



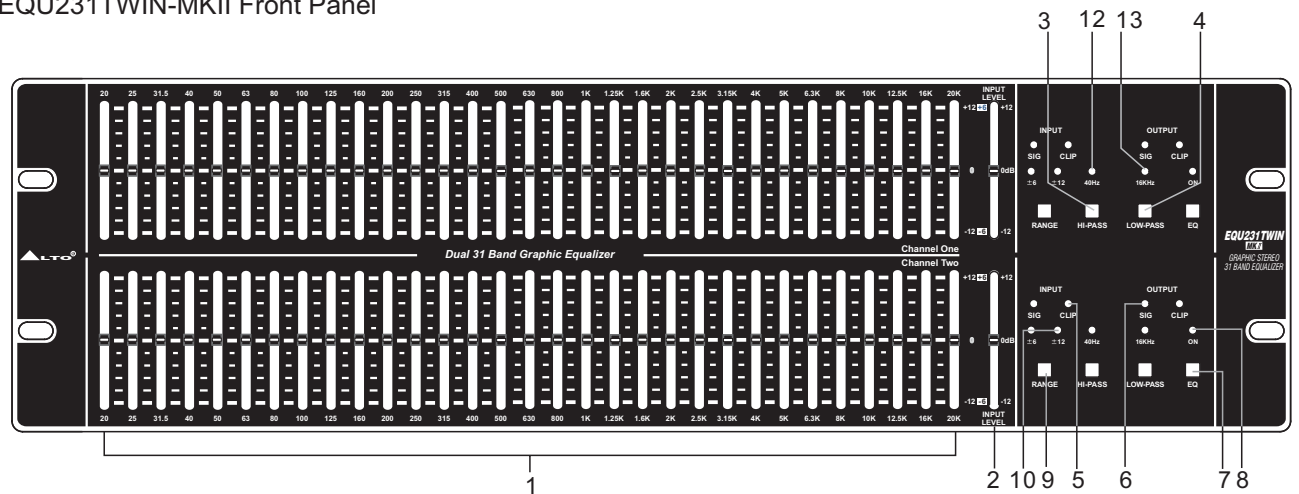
• EQU231VU-MKII Front Panel



• EQU231-MKII Front Panel



• EQU231TWIN-MKII 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.Signal LED

This green LED will light when any signal appears at input/output stage.

7.EQ switch

This switch inserts or removes the equalizer to channel path. If press this switch, the EQ LED (7) will be illuminated, which means it is in EQ mode. When release this switch, the input signal is routed directly to the output jacks. which means it is in bypass mode.

8.EQ LED

When this LED lights, it is in EQ mode.

9.Range switch

This button switches the gain range of the filter potentiometer between $\pm 6\text{dB}$ and $\pm 12\text{dB}$.

10.Filter range indicator

When the $\pm 6\text{dB}$ range is selected, green LED will light. When the $\pm 12\text{dB}$ range is selected, red LED will light.

11.VU meter

This VU meter is used to indicate the output level.

12.High pass LED

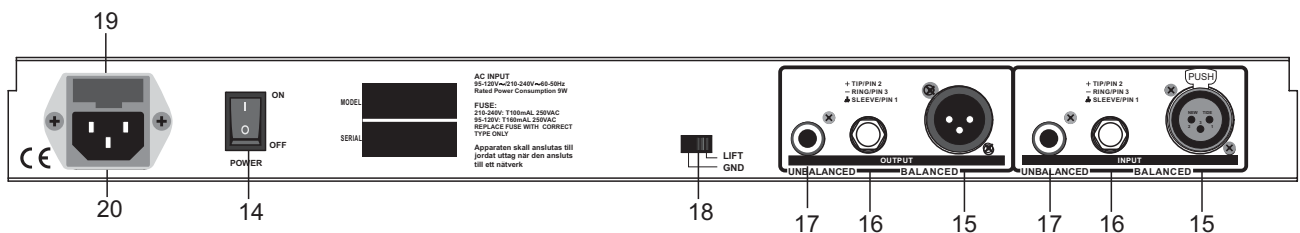
When the High pass filter (40Hz/12dB) is in active, this LED will light.

13.Low pass LED

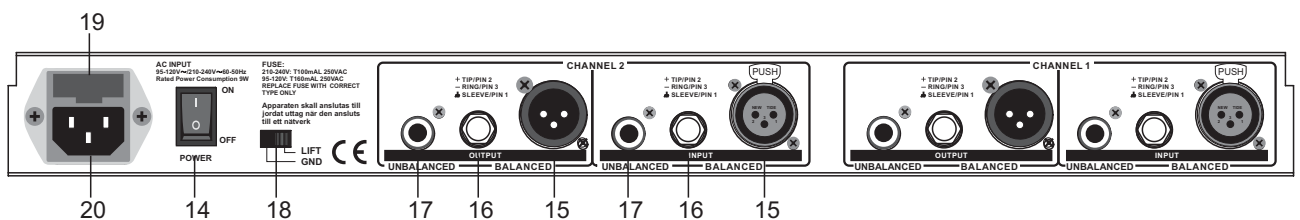
When the Low pass filter (16KHz/12dB) is in active, this LED will light.

3.2 The Rear Panel

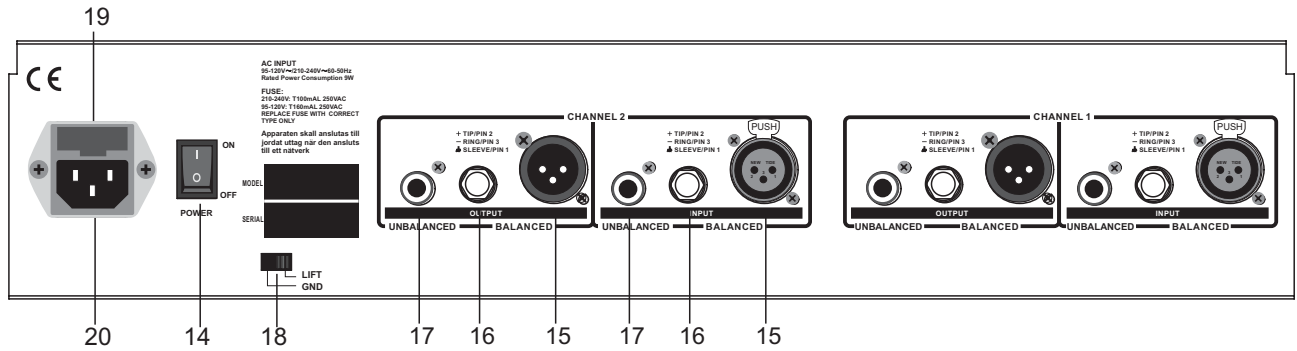
• EQU131-MKII Rear Panel



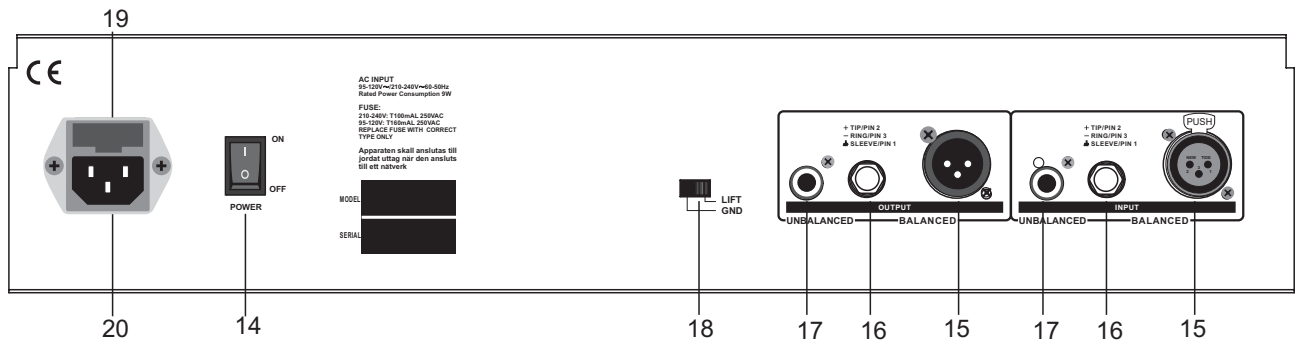
• EQU215-MKII Rear Panel



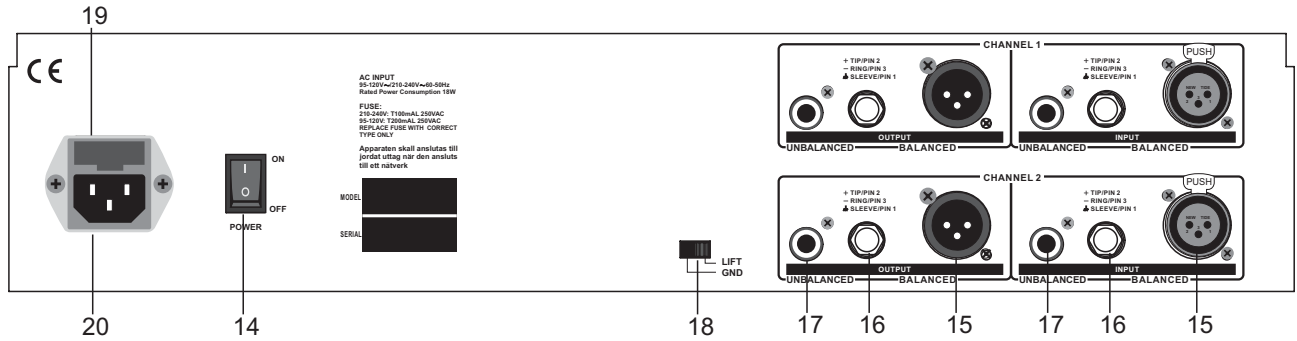
• EQU215TWIN-MKII Rear Panel



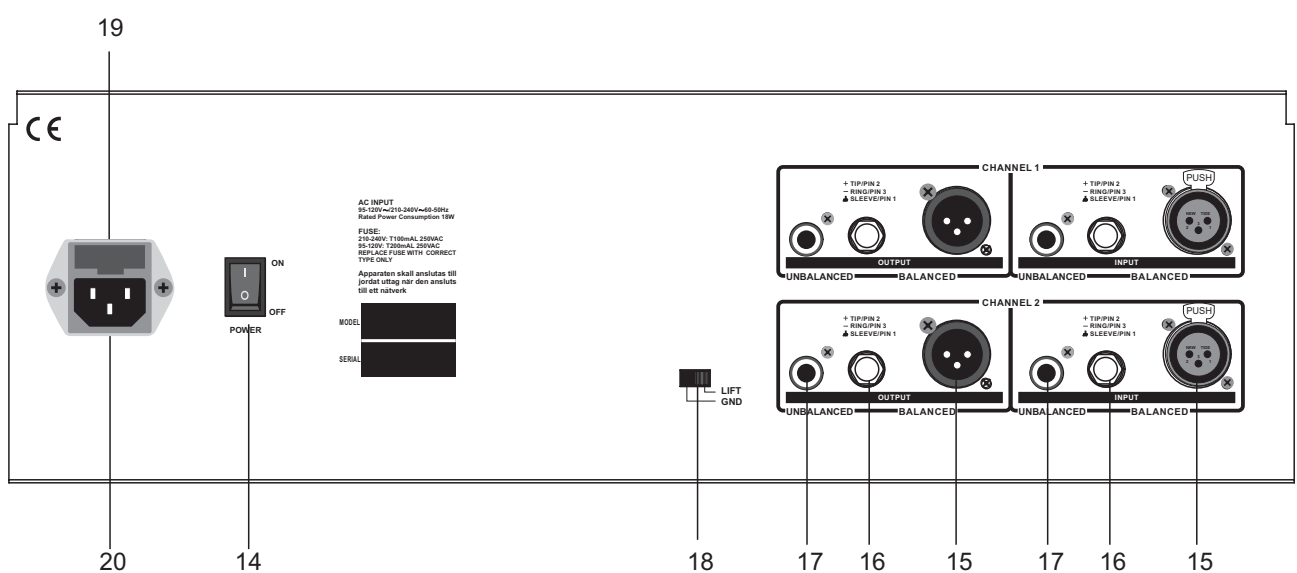
• EQU131VU-MKII Rear Panel



• EQU231VU-MKII/EQU231-MK II Rear Panel



• EQU231TWIN-MKII Rear Panel



14. 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.

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.

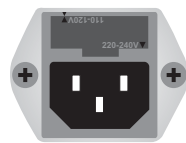
NOTE: While you can use any input connector with any output connector, only one set of these connectors is to be used at one time, detail wiring and connection, please refer to 4.2 audio connection.

18. Ground lift switch

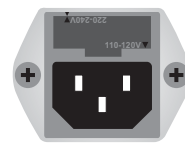
This switch is used to disconnect the signal ground from the mains and chassis earth. If it is determined that the equalizer is the cause of hum or buzz in your system due to a ground loop, move this switch to the "lift" position.

19. Fuse holder / Voltage selector

You must be sure of the Voltage available in your country because this is a Dual Voltage unit. Voltage operation can be changed through the fuse protecting the power supply but this operation must be performed by a qualified engineer.



This is set for
110V AC TO 120V AC
operation



This is set for
220V AC TO 240V AC
operation

Please note the triangular markers on both sides of the fuse holder (see above figure). To change the voltage pull the fuse holder out, rotate it 180° and push it back again. The operating voltage will be indicated by one of the two triangular markers.

20. AC Inlet

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

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

4. INSTALLATION & CONNECTION

4.1 Mains Connection

Please ensure that the EQU MKII 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.

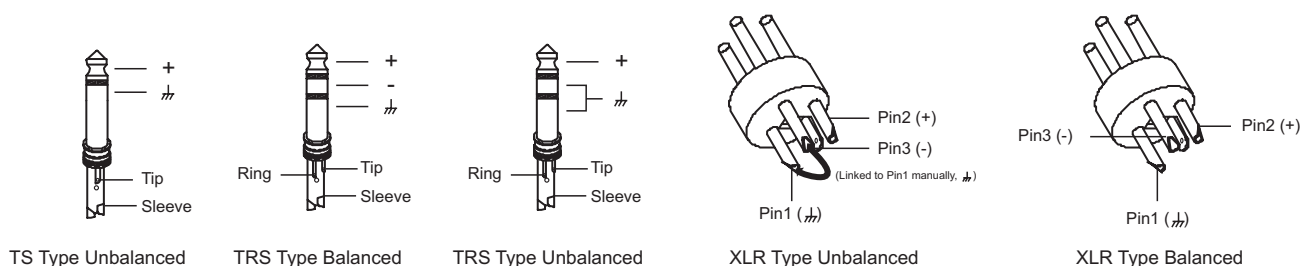
The mains connection of the EQU MKII Series Graphic Equalizer is made by using the enclosed mains cord and a standard IEC receptacle. It meets all of the international safety certification requirements.

4.2 Audio Connection

The EQU MKII 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 MK II 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

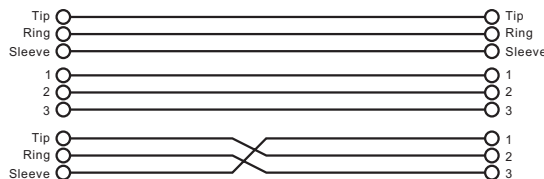
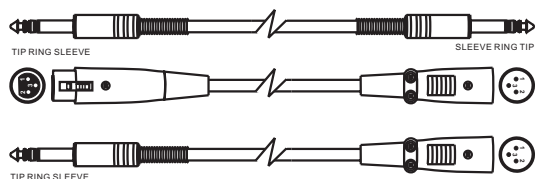
Either the 1/4" TRS phone jack or the XLR connector can be wired in balanced and unbalanced modes, which will be determined by the actual application status, please wire your system as the following wiring examples:



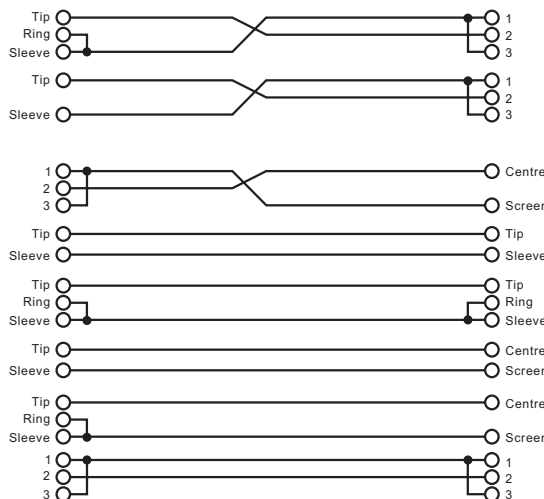
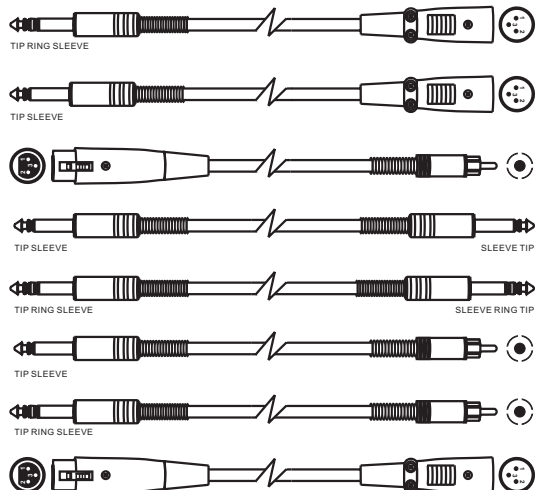
- In Line Connection

For these applications the EQU MKII 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



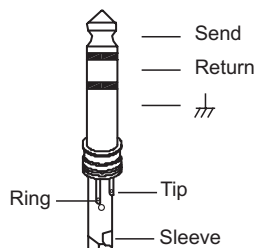
• Unbalanced



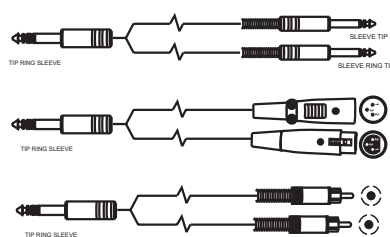
- Insert Points Connection

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 manufacturers or your music dealer. The EQU MKII Series fits into one standard 19" rack unit of space: the EQU131-MKII and EQU215-MK II are 1H height, the EQU231TWIN is 3H height, while the other four models (EQU215TWIN-MKII, EQU131VU MKII, EQU231VU-MKII and EQU231-MKII) are 2H height. Please allow at least an additional 4" depth for the connectors on the rear panel.

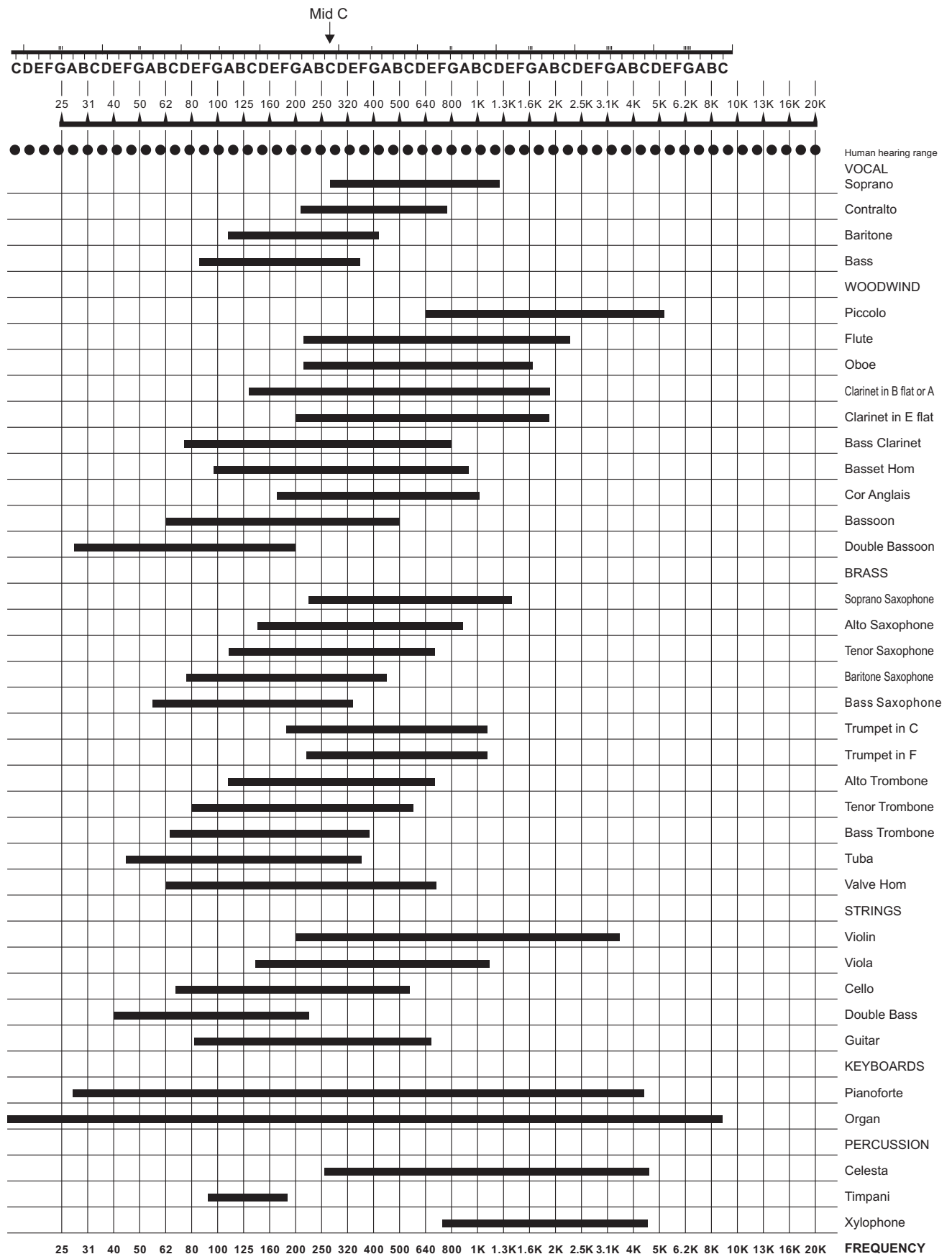
Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the EQU MKII Series on high temperature devices such as power amplifiers etc. to avoid overheating.

5. APPLICATION

5.1 The Sound Frequency

In recording studios as well as stage or radio plays, the EQU MKII 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 you can obtain nice results in terms of sound characterization. The tables on the following pages will 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

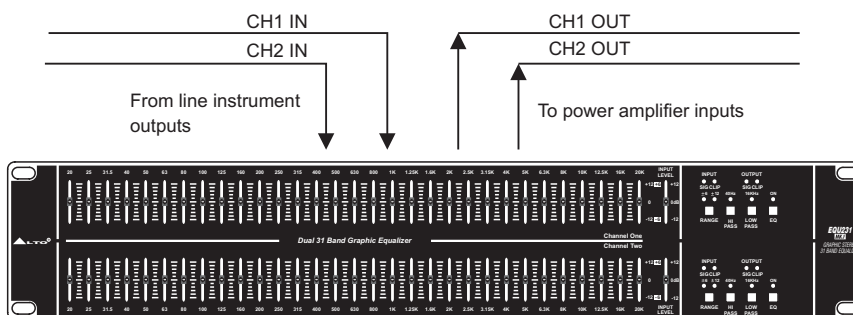
The EQU MKII Series Graphic Equalizers can be used in the sound reinforcement systems to:

- 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 MKII 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 MKII Series Equalizer in an effects send and return it to the mix bus.

The following connection is probably most common field of application:

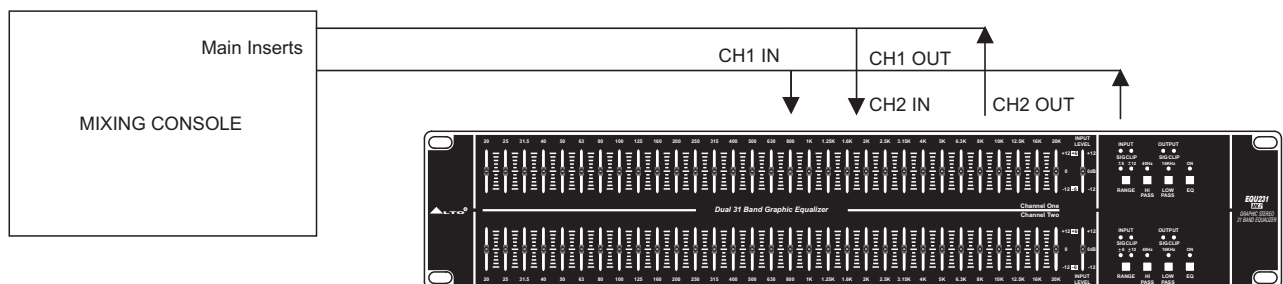
- Line Instrument

The EQU MKII 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 MKII 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

- For mono application, please use the EQU131-MKII, EQU131VU-MKII mono Graphic Equalizer.
- For stereo application, please use the EQU215-MKII, EQU215TWIN-MKII, EQU231-MKII, EQU231VU-MKII or EQU231TWIN-MKII stereo Graphic Equalizer, either of the two channels can be used as L/R input & output.

6. TECHNICAL SPECIFICATIONS

Type	
EQU231VU-MKII	2×31 Band: 1/3 octave, ISO spacing (2H series)
EQU231-MKII	2×31 Band: 1/3 octave, ISO spacing (2H series)
EQU231TWIN-MKII	2×15 Band: 2/3 octave, ISO spacing (3H series)
EQU131VU-MKII	1×31 Band: 1/3 octave, ISO spacing (2H series)
EQU131-MKII	1×31 Band: 1/3 octave, ISO spacing (1H series)
EQU215-MKII	2×15 Band: 1/3 octave, ISO spacing (1H series)
EQU215TWIN-MKII	2×31 Band: 1/3 octave, ISO spacing (2H series)
Slider travel	20mm with positive centre detente (EQU231-MKII/EQU231VU-MKII/EQU131-MKII/EQU215-MKII) 45mm with positive centre detente (only for EQU231TWIN-MK II) 60mm with positive centre detente (EQU131VU-MKII/EQU215TWIN-MKII)
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	14dBu
Output connections	Active balanced XLR and 1/4" TRS Unbalanced RCA
Input impedance	20kohm (bal) 15kohm (unbal)
Output impedance	< 600Ω
High pass filter	40Hz (12dB/oct) fixed-button type .
Low pass filter	16KHz (12dB/oct) fixed-button type
Frequency response	20Hz to 50KHz at - 1.5dBu
THD + N %	0.01% ↓ (@ 1KHz , all VR at middle position)
S / N ratio	110dB
Power supply	95V-120VAC -60Hz 220V-240VAC -50Hz/60Hz
Consumption	
EQU231VU-MKII	2×31 band, 1/3 octave, ISO spacing: 18W
EQU231-MKII	2×31 band, 1/3 octave, ISO spacing: 18W
EQU231TWIN-MKII	2×31 band, 1/3 octave, ISO spacing: 18W
EQU131VU-MKII	1×31 band, 1/3 octave, ISO spacing: 9W
EQU131-MKII	1×31 band, 1/3 octave, ISO spacing: 9W
EQU215-MKII	2×15 band, 1/3 octave, ISO spacing: 9W
EQU215TWIN-MKII	2×15 band, 1/3 octave, ISO spacing: 9W
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)×132(H)(19"×8.66"×5.1")mm (3H 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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