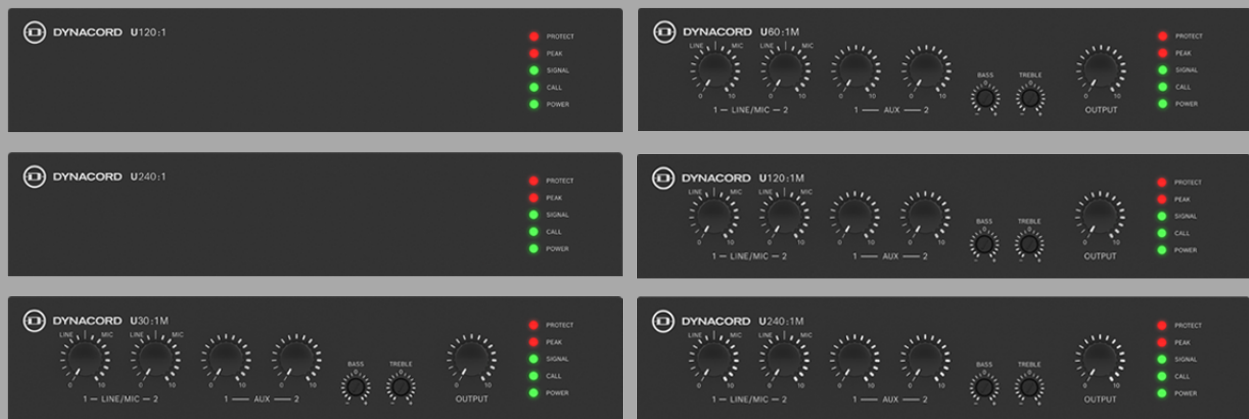


# U Series

U30:1M | U60:1M | U120:1M | U240:1M | U120:1 | U240:1





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# 1 Important product information

## 1.1 Safety information

1. Read and keep these safety instructions. Follow all instructions and heed all warnings.
2. Download the latest version of the applicable installation manual from [www.dynacord.com](http://www.dynacord.com) for installation instructions.



### Information

Refer to the Installation Manual for instructions.

3. Follow all installation instructions and observe the following alert signs:



**Notice!** Containing additional information. Usually, not observing a notice does not result in damage to the equipment or personal injuries.



**Caution!** The equipment or the property can be damaged, or persons can be injured if the alert is not observed.






**Warning!** Risk of electric shock.

4. System installation and servicing by qualified personnel only, in accordance with applicable local codes. No user-serviceable parts inside.
5. System installation for emergency sound (except for call stations and call station extensions) in a Restricted Access Area only. Children may not get access to the system.
6. For rack-mounting of system devices, make sure that the equipment rack is of suitable quality to support the weight of the devices. Use caution when moving a rack to avoid injury from tip over.
7. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.



**Warning!** To reduce the risk of fire and electric shock, do not expose this apparatus to rain or moisture.

8. Mains powered equipment shall be connected to a mains power outlet socket with a protective earthing connection. An external, readily operable, mains plug or all-pole mains switch shall be installed.
9. Only replace the mains fuse of an apparatus with a fuse of the same type.
10. The protective ground connection of an apparatus shall be connected to protective ground before the apparatus is connected to a power supply.
11. This unit has an autoranging input circuitry suitable for 100-240 Vac.
12. Amplifier outputs marked with  may carry audio output voltages up to 120 V<sub>RMS</sub>. Touching uninsulated terminals or wiring may result in an unpleasant sensation. Amplifier outputs marked with  or  may carry audio output voltages above 120 V<sub>RMS</sub>. It requires a skilled person to strip and connect the loudspeaker wires in such a way that the naked conductors are inaccessible.



13. To prevent hearing damage do not listen at high volume levels for long periods.

## 1.2 Disposal instructions



### **Old electrical and electronic appliances.**

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

## 1.3 Class B Notice for FCC and ICES 003

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and Canadian ICES-003 requirements. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## 2 About this manual

The purpose of this manual is to provide information required for installing, configuring, operating and maintaining these products.

Read through this manual to familiarize yourself with the safety information, features, and applications before you use it.

### 2.1 Digital document

This manual is available as a digital document in the Adobe Portable Document Format (PDF).

You can find information about Dynacord products on the product related information at [www.dynacord.com](http://www.dynacord.com).

### 2.2 Intended audience

This manual is intended for everyone who is authorized to install and use these products.

### 2.3 Copyright notice

Unless otherwise indicated, this publication is the copyright of Dynacord. All rights are reserved.

### 2.4 Trademarks

Throughout this document trademark names may have been used. Rather than put a trademark symbol in every occurrence of a trademark name, Dynacord states that the names are used only in an editorial fashion and to the benefit of the trademark owner with no intention of infringement of the trademark.

### 2.5 Notice of liability

While every effort has been taken to ensure the accuracy of this document, neither Dynacord nor any of its official representatives shall have any liability to any person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by the information contained in this document.

Dynacord reserves the right to make changes to features and specifications at any time without prior notification in the interest of ongoing product development and improvement.

## 2.6 Short information

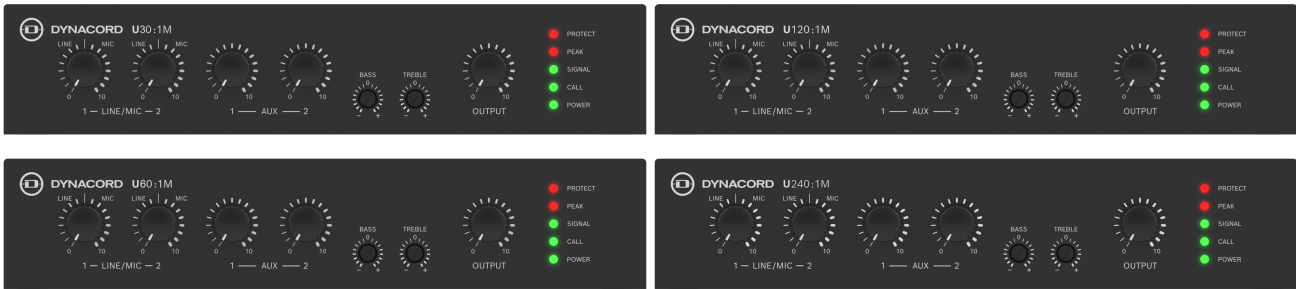
The following table lists products in a family, with CTN (Commercial Type Number) and identifying product name DESCRIPTION.

<b>CTN</b>	<b>Description</b>
U120:1-EU	Power amplifier 120 W, 1 channel, EU
U240:1-EU	Power amplifier 240 W, 1 channel, EU
U120:1-US	Power amplifier 120 W, 1 channel, US
U240:1-US	Power amplifier 240 W, 1 channel, US
U120:1-CN	Power amplifier 120 W, 1 channel, CN
U240:1-CN	Power amplifier 240 W, 1 channel, CN
U30:1M-EU	Mixer amplifier 30 W, 1 channel, EU
U60:1M-EU	Mixer amplifier 60 W, 1 channel, EU
U120:1M-EU	Mixer amplifier 120 W, 1 channel, EU
U240:1M-EU	Mixer amplifier 240 W, 1 channel, EU
U30:1M-US	Mixer amplifier 30 W, 1 channel, US
U60:1M-US	Mixer amplifier 60 W, 1 channel, US
U120:1M-US	Mixer amplifier 120 W, 1 channel, US
U240:1M-US	Mixer amplifier 240 W, 1 channel, US
U30:1M-CN	Mixer amplifier 30 W, 1 channel, CN
U60:1M-CN	Mixer amplifier 60 W, 1 channel, CN
U120:1M-CN	Mixer amplifier 120 W, 1 channel, CN
U240:1M-CN	Mixer amplifier 240 W, 1 channel, CN

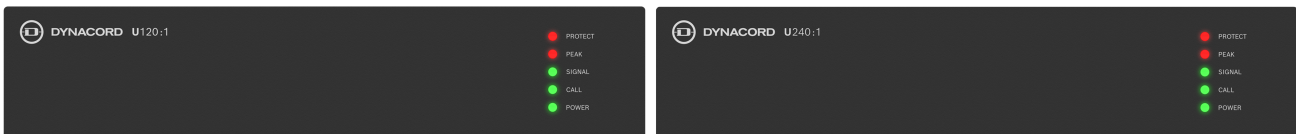
### 3 Product introduction

Introducing the U Series: a range of ultra-compact single-channel mixer amplifiers and power amplifiers tailored for commercial environments.

Designed to offer cost-effective yet high-quality amplification, the U Series caters to single-zone setups in smaller commercial spaces like cafes, shops, and offices. With flexible power output options, this U series ensures customized performance to suit specific requirements. The mixer amplifier models are available in 30 W, 60 W, 120 W, and 240 W models, with 4 input channels plus an emergency override input, and 1 output channel in lowZ and highZ.



The power amplifier models are available in 120 W and 240 W models, with 1 input channel plus an emergency override input, and 1 output channel in lowZ and highZ.



## 3.1 Features and functions

### **Versatile power outputs**

The product range includes mixer amplifiers offering power outputs of 30 W, 60 W, 120 W, and 240 W, along with power amplifiers available in 120 W and 240 W variants. This comprehensive selection ensures optimal performance across a diverse range of applications and settings, catering to various audio needs with precision.

### **Advanced amplification technology**

Embracing class-D amplification topology, the range integrates advanced technology to deliver superior energy efficiency, enhanced product quality, and improved reliability compared to conventional linear power supply and class-AB amplification systems. Users can expect exceptional performance and durability in their audio setups.

### **Compact form factor**

Designed for space efficiency, all units feature a half rack, 1RU enclosure. This compact form factor allows for seamless integration into existing setups, optimizing space utilization without compromising on performance or functionality.

### **Full power at low and high impedance**

Users can configure the product for high impedance (70 V and 100 V) or low impedance (4  $\Omega$  and 8  $\Omega$ ) settings, ensuring compatibility with a wide range of speaker systems.

### **Phantom power**

Exclusive to the mixer models, both microphone inputs are equipped with phantom power support. This feature enhances microphone compatibility, enabling users to utilize a wider range of microphones for their audio applications.

### **VOX ducking**

Incorporating VOX ducking technology, the device automatically prioritizes voice input over line-level signals, particularly beneficial during announcements or speeches. This intelligent feature ensures clear and seamless transitions in audio playback, enhancing overall communication effectiveness.

### **Remote power OFF**

The inclusion of contact closure for remote power ON/OFF provides users with convenient operational control. This feature enables users to manage the power state of the amplifier remotely, enhancing ease of use and flexibility in various operational scenarios.

### **Bass and treble adjustment**

Users can fine-tune the audio output according to their preferences with dedicated bass and treble adjustment controls. This intuitive feature allows for customizable sound shaping, ensuring an optimized listening experience tailored to specific requirements.

### **High-pass filter**

Offering a 120 Hz high-pass filter option, the amplifier allows users to tailor the audio output to suit their specific needs. This adjustable filter provides greater control over the frequency response, enabling users to optimize audio playback for various applications and environments.

### **Flexible mounting options**

With support for rack mount (single or side-by-side), table-top, or under-table mounting, users benefit from versatile installation options. Included brackets and accessories facilitate easy and hassle-free mounting, ensuring seamless integration into any setup with minimal effort.

**Emergency input**

Featuring 100 V and Line In emergency inputs with speaker level selection, the amplifier facilitates seamless integration with EVAC (Emergency Voice Alarm Communication) systems. This essential feature ensures reliable emergency communication, enhancing safety and security in commercial spaces.

**Protection**

The amplifier is equipped with comprehensive protection features, including safeguards against overload and short circuits. A limiter further protects both the amplifier and loudspeaker against accidental overdriving, ensuring reliable and long-lasting performance. Additionally, a temperature-controlled fan, available only in the 120 W and 240 W versions, ensures proper cooling without generating acoustic noise at lower output levels, maintaining optimal operation under varying conditions.

**Easy and accessible front control for mixers**

Offering convenient access to main gain, input gain per channel, and bass and treble settings, the mixer models feature easy-to-use front panel controls. This user-friendly design allows for quick and hassle-free adjustment of audio settings, enhancing overall usability and convenience.

**Protected control for amplifiers**

Amplifier models feature protected controls located on the rear panel, eliminating front panel controls for added security and simplicity. Users can "set it and forget it," with gain, bass, and treble controls conveniently positioned for easy access during setup and operation.

## 4 General installation procedures

Before starting installation, ensure the following:

- You make use of manufacturer specified installation materials.
- No liquids can spill into or on the products.
- Installation is in a clean environment free of dust.
- The ventilation airflow of the 19" units is not obstructed.
- There is a mains power outlet of sufficient rating close to the intended location of the products.
- Sufficient free space and access at the rear of the 19" units for connectors and wiring.

### 4.1 Unpacking

The products should be unpacked and handled with care. If an item appears to be damaged, notify the shipper immediately. If any items are missing, notify your Dynacord representative.

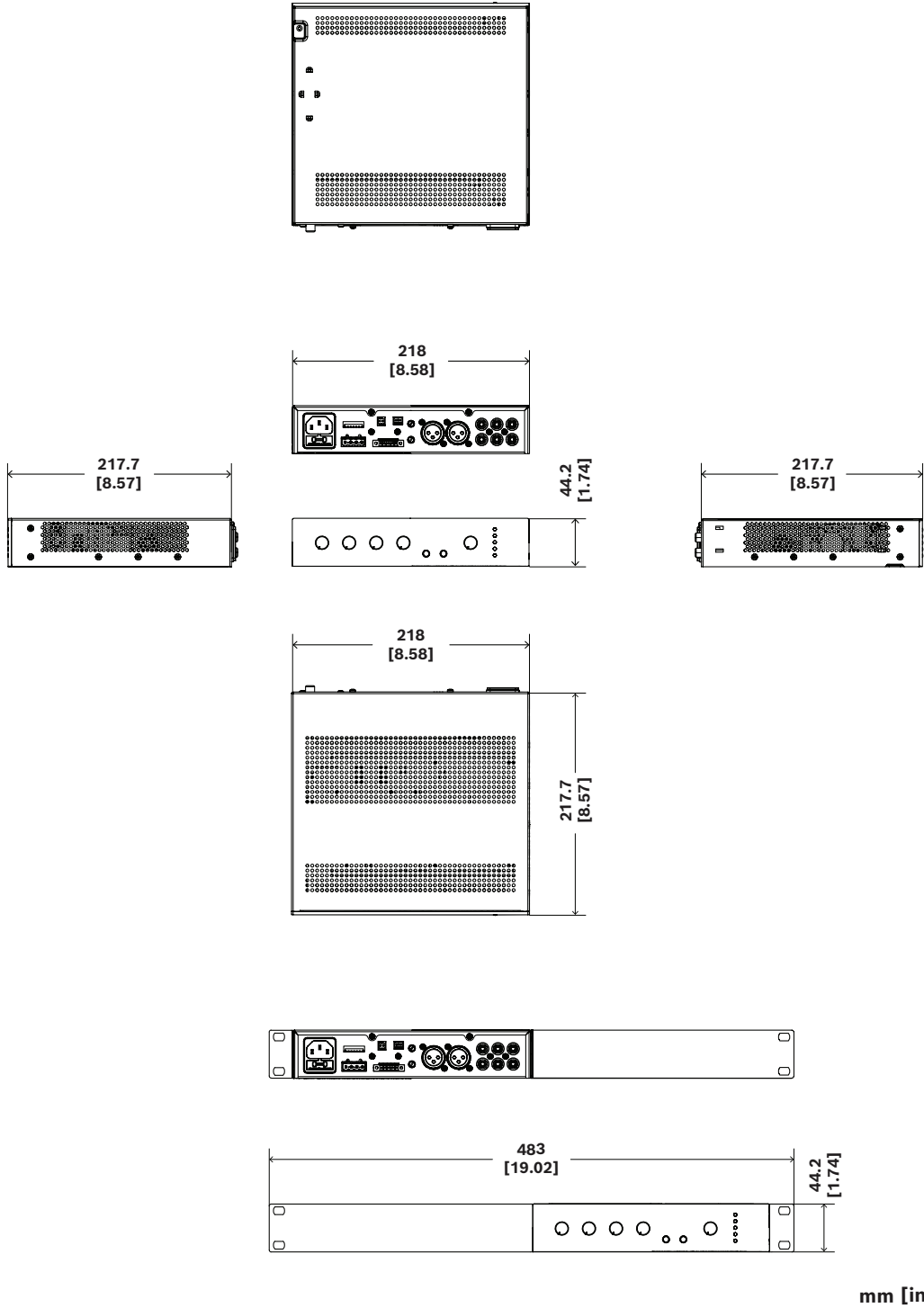
The original packaging is the safest container in which to transport products and can also be used to return products for service, if necessary.

### 4.2 Parts included

Quantity	Component
1	Mixer amplifier or Power amplifier
1	Mains cord
1	Euroblock connector 2-pole for Remote power OFF
1	Euroblock connector 2-pole for EMG input
1	Euroblock connector 4-pole for outputs LoZ and HiZ
1	Euroblock connector 5-pole for MIC1 / PTT input
4	Rubber feet
1	M3 screw
2	Short rack ears
1	Long rack ear
1	Connection plate
1	Quick installation guide
1	Safety information

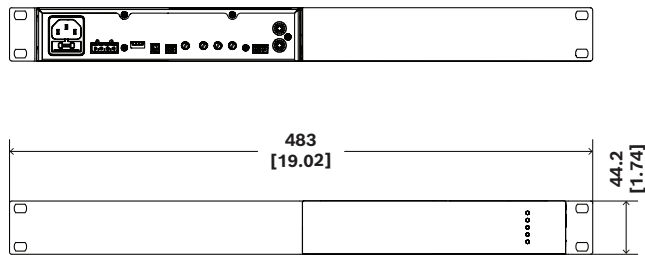
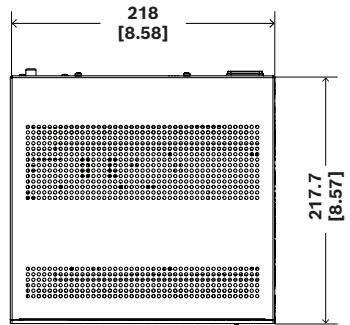
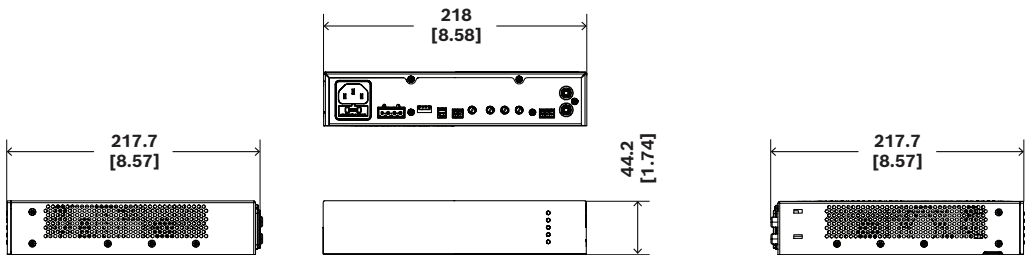
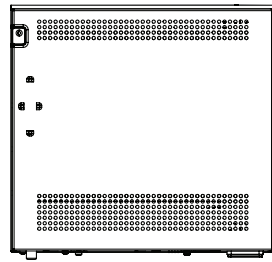
### 4.3 Dimensions

#### Mixer amplifier





### Power amplifier



mm [in]

## 4.4 Mounting and ventilation



**Notice!**

Before mounting the device, it is recommended to make the required settings.

The U Series mixer amplifiers and power amplifiers have four mounting options.

**Stand-alone mounting in a 19"-rack**

The mixer amplifiers and power amplifiers can be fitted alone in a standard 19"-rack. Mount one short rack ear to the preferred side of the device using the build-in screws.

Unscrew the existent screws, attach the rack ear and screw them back in.

Mount the long rack ear (B) on the opposite side by unscrewing the existent screws on the side of the amplifier, attaching the long ear and screwing them back in (1).

Attach the amplifier with its frontal rack mount ears (short and long) (C) using four screws and washers (2) as shown in the illustration.

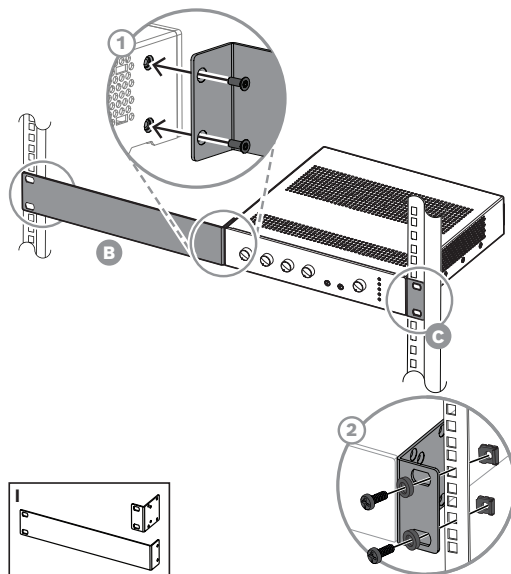


Figure 4.1: Stand-alone mounting in a 19"-rack (U30:1M / U60:1M / U120:1M / U240:1M)

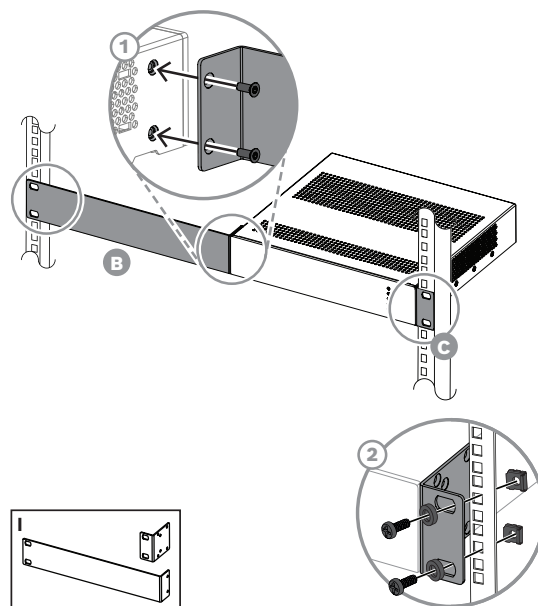


Figure 4.2: Stand-alone mounting in a 19"-rack (U120:1 / U240:1)

### Side-by-side mounting in a 19"-rack

If you intend to use the full 19"-rack, you can stack two amplifiers in one rack slot. The U Series devices can also be mounted with a V600:2 side-by-side. U Series and V Series have the same side-by-side mounting system. Power amplifiers can be mounted together with mixer amplifiers. They all have the same side-by-side mounting system. Additionally, the U Series devices can be mounted with other compatible devices using the same side-by-side mounting system. To install both amplifiers in a side-by-side configuration:

1. Mount the one short rack ear to one side of one amplifier using the existent screws (C). Unscrew the existent screws, attach the rack ear and screw them back in. Do this for both amplifiers. The two short rack ears must be in opposite sides.
2. Mount the center connecting plate. Unscrew the four existent screws, attach the connecting plate and screw them back in (D) as shown in the illustration.

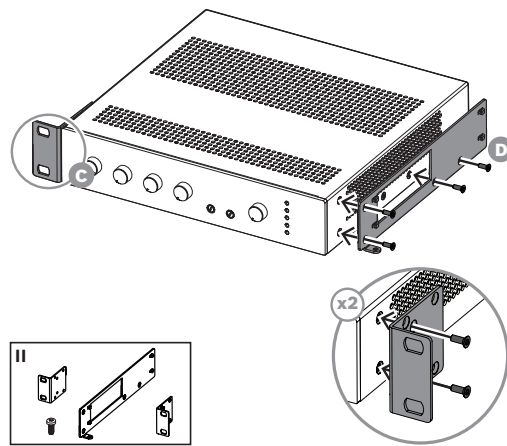


Figure 4.3: Connecting the rack ears and the connecting plate (U30:1M / U60:1M / U120:1M / U240:1M)

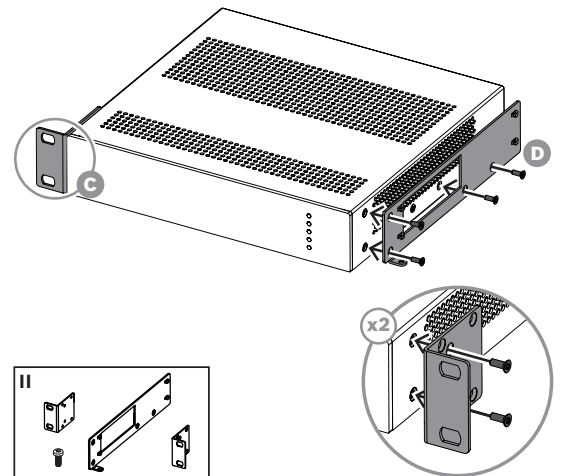


Figure 4.4: Connecting the rack ears and the connecting plate (U120:1 / U240:1)

3. Once the connecting plate is attached to one amplifier, align the four rectangular openings in the side of the amplifier with the four hooks (1) and slide the other amplifier until the two amplifiers hook together (2). To prevent pushback of the amplifiers, screw in the supplied M3 bolt (3) into the screw hole on the bottom of the amplifier as shown in the illustration.

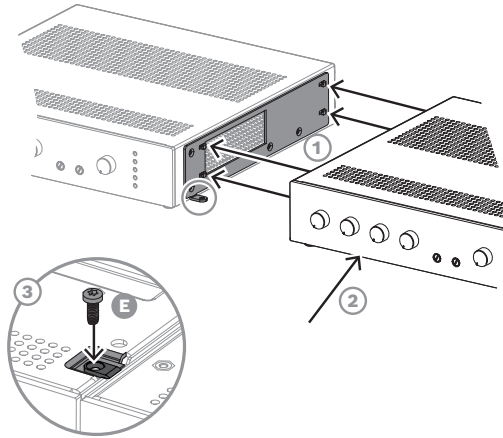


Figure 4.5: Two amplifiers hooked together with connection plate mounted and M3 bolt to prevent pushback (U30:1M / U60:1M / U120:1M / U240:1M)

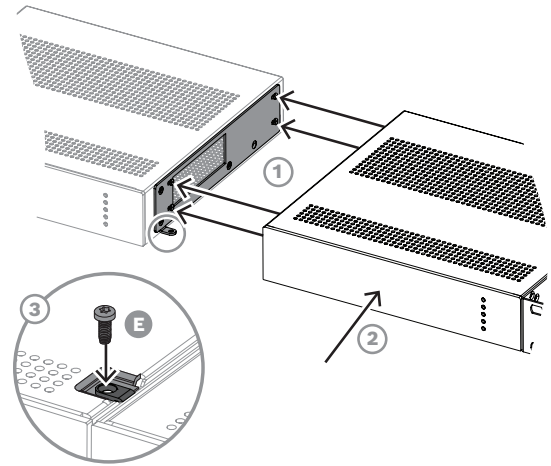


Figure 4.6: Two amplifiers hooked together with connection plate mounted and M3 bolt to prevent pushback (U120:1 / U240:1)

4. Attach the power amplifier with its frontal rack mount ears using four screws and washers as shown in the illustration.

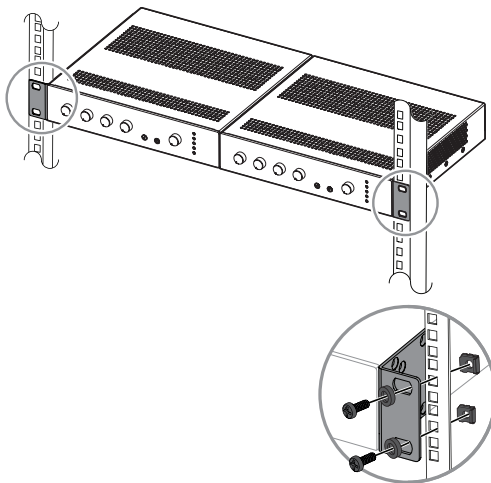


Figure 4.7: Side-by-side mounting in a 19"-rack (U30:1M / U60:1M / U120:1M / U240:1M)

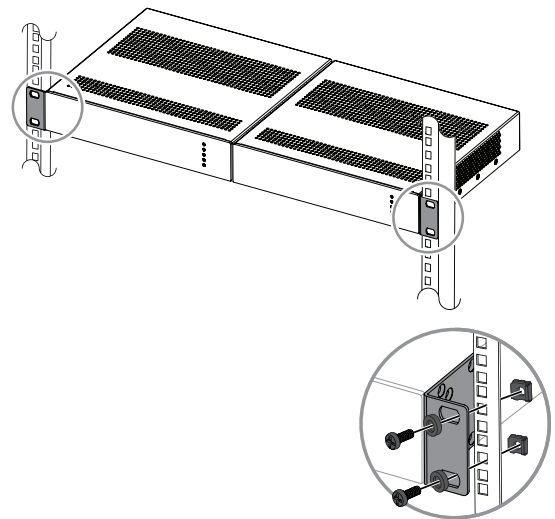


Figure 4.8: Side-by-side mounting in a 19"-rack (U120:1 / U240:1)

### Tabletop use (over and under the table)

You can use this device outside a 19"-rack on a tabletop, mounted over or under the table.

For under the table mounting:

1. Stick the supplied rubber feet in the corners of the device top surface for more stability with this type of installation (F). Place the rubber feet in the edges of the lid so that they are not on top of the labels. For the correct position, refer to the Quick installation guide of the product.
2. Align the short rack ears with the side screws of the amplifier (C). Unscrew the existent screws, attach the rack ear and screw them back in (1).
3. Secure the device by screwing the rack ears to the table as shown in the illustration (2).

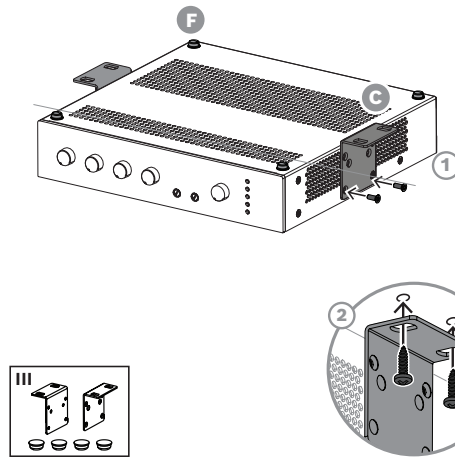


Figure 4.9: Tabletop use - under the table (U30:1M / U60:1M / U120:1M / U240:1M)

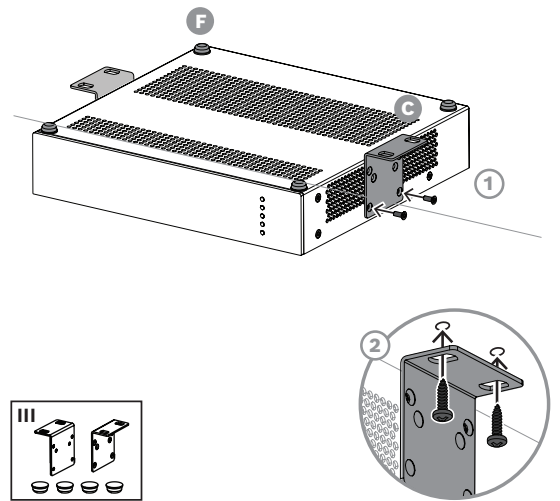


Figure 4.10: Tabletop use - under the table (U120:1 / U240:1)

For tabletop mounting:

1. Stick the supplied rubber feet in the corners of the device bottom surface for more stability with this type of installation (F). For the correct position, refer to the Quick installation guide of the product.
2. Align the short rack ears with the side screws of the amplifier (C). Unscrew the existent screws, attach the rack ear and screw them back in (1).
3. Secure the device by screwing the rack ears to the table as shown in the illustration (2).

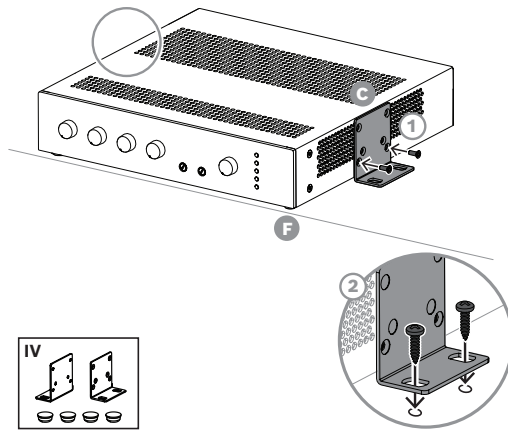


Figure 4.11: Tabletop use - over the table  
(U30:1M / U60:1M / U120:1M / U240:1M)

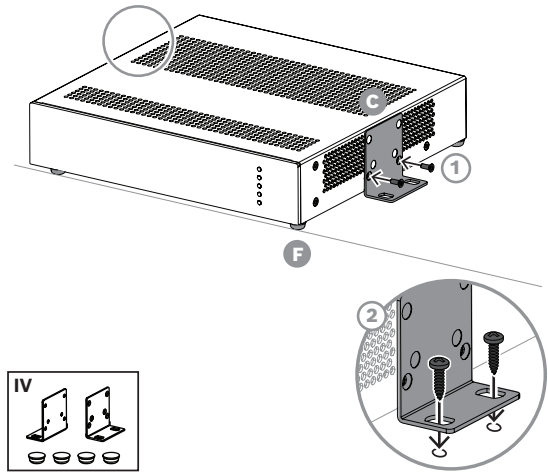


Figure 4.12: Tabletop use - over the table  
(U120:1 / U240:1)

#### Ventilation (for all models)

The airflow direction is side-to-side. In general, setting up or mounting the power amplifier has to be done in a way that fresh air can enter unhindered at the side and exhausted air can exit at the opposite side. When installing the power amp in a case or rack system, attention should be paid to these details to provide sufficient ventilation. Note that two of the versions, the U30:1M and U60:1M, do not have a fan and operate using convection cooling, with airflow from bottom-to-top. It's important to note that the U120:1M, U240:1M, U120:1 and U240:1 versions are also convection cooled, with airflow from bottom-to-top. In situations where there is excessive heat or output power, these models can optionally activate the fan to provide additional cooling. When the fan is in use, the airflow direction shifts to side-to-side, ensuring efficient heat dissipation and maintaining optimal performance of the amplifiers.

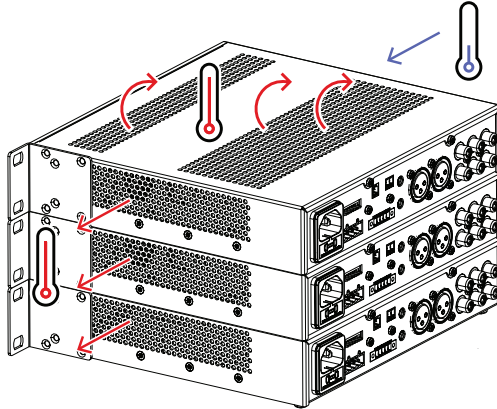


Figure 4.13: Rack mounting of several U series amplifiers. Illustration of the U30:1M / U60:1M / U120:1M / U240:1M models.

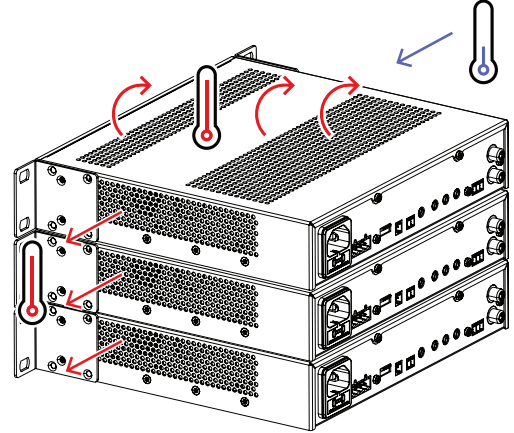


Figure 4.14: Rack mounting of several U series amplifiers. Illustration of the U120:1 / U240:1 models.

- Allow for an air duct of at least 60 mm between the rear panel of the power amplifier and the inner wall of the cabinet/rack case.
- Make sure that the duct reaches up to the cabinets or the rack case's top ventilation louvers.
- Leave room of at least 100 mm above the cabinet/rack case for ventilation. Since temperatures inside of the cabinet/rack case can easily rise up to 40 °C during operation of the power amp, it is mandatory to bear in mind the maximum allowable ambient temperature for all other appliances installed in the same cabinet/rack case.



**Caution!**

Blocking/closing the power amp's ventilation louvers is not permissible. Without sufficient cooling/ventilation, the power amplifier may enter protect mode. Keep ventilation louvers free from dust to ensure unhindered airflow.



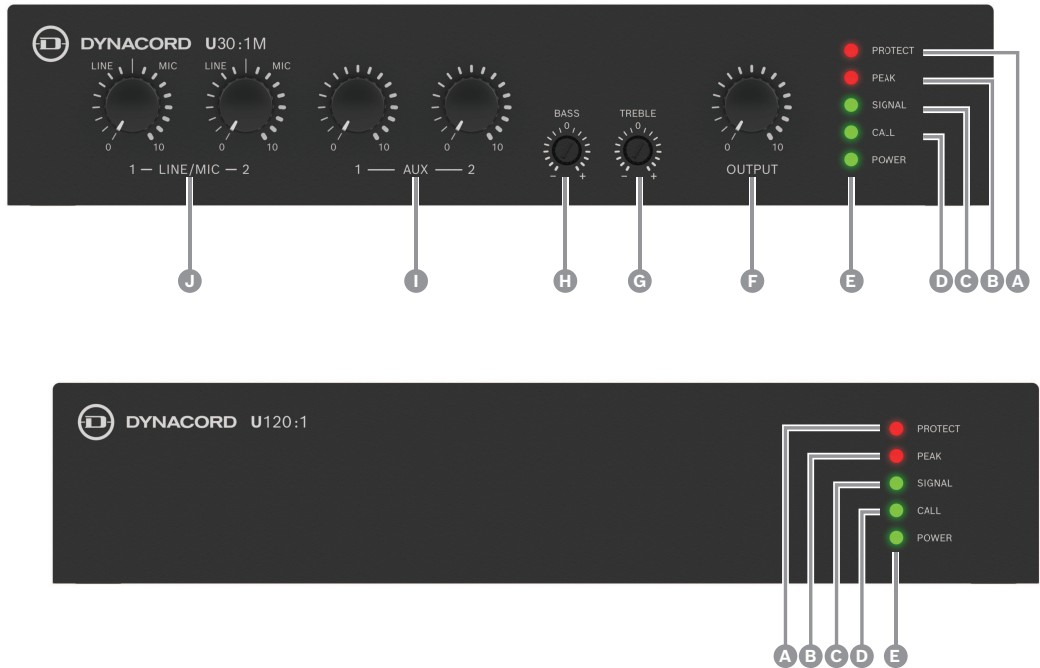
**Notice!**

Do not use the power amplifier in direct sunlight or near heat sources, like heater blowers, stoves, or any other heat radiating devices.

# 5 Installation

## 5.1 Indicators, controls and settings

Front view

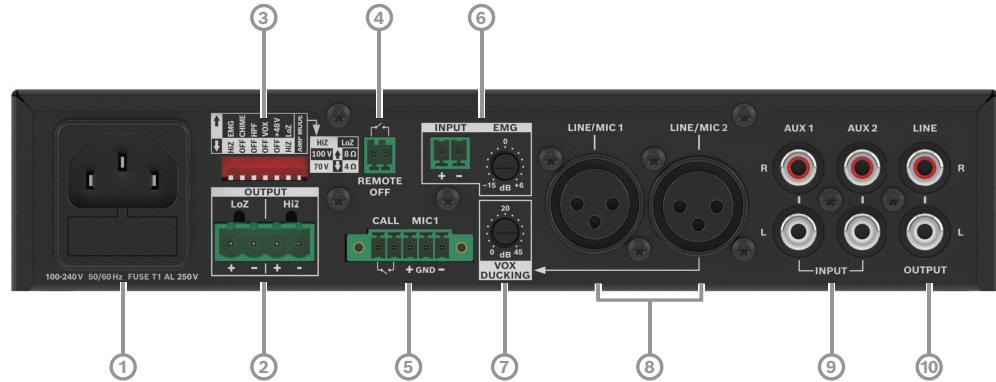


	LED	Indicator description	Color
A	Protect	Activated in case of protection or short-circuit	Red
B	Peak	Activated at -1 dB before clipping	Red
C	Signal	Activated at -45 dB before clipping	Green
D	Call	Activated by EMG, Push-to-talk or VOX input	Green
E	Power	Activated when the amplifier is on	Green
F	N/A	Output gain	N/A
G	N/A	Treble adjustment	N/A
H	N/A	Bass adjustment	N/A
I	N/A	Aux 1 / 2 gain	N/A
J	N/A	Line/Mic 1 / 2 gain	N/A



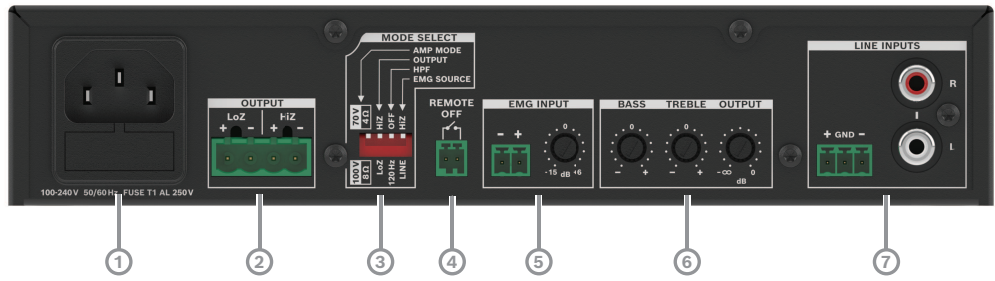
**Rear view**

**Mixer amplifiers (U30:1M | U60:1M | U120:1M | U240:1M)**



	Description
1	AC mains input socket
2	Output connector
3	DIP-switches
4	Remote OFF control input connector
5	Call station/mic 1 input
6	100 V / line level emergency input connector and EMG level control potentiometer
7	VOX ducking control
8	Line/mic 1/ 2 input, XLR connector
9	AUX input 1 / 2, RCA/cinch connector
10	LINE output, RCA/cinch connector

**Power amplifier (U120:1 | U240:1)**



	Description
1	AC mains input socket
2	Output connector
3	DIP-switches
4	Remote OFF control input connector
5	100 V / line level emergency input connector and EMG level control potentiometer
6	Bass, treble and output control
7	Line inputs: balanced input (3-pin Eurostyle connector), unbalanced input (RCA/cinch connector)

**5.1.1**

**LED behavior**

LED	Color	Description
Power	Green (solid)	– Power is ON and Remote Off is not activated.
	OFF	– Power is OFF, – Power is ON and Remote Off is activated.
Call	Green (solid)	– Call-station's Push-to-talk is triggered, – VOX on MIC2 is triggered, – EMG signal is triggered (LED will stay on for 10 seconds after the EMG signal is stopped).
	OFF	– No Push-to-talk, MIC2 or EMG signal active.

LED	Color	Description
Signal	Green (solid)	<ul style="list-style-type: none"> <li>- Amplifier output reaches above -45 dBr (-45 dB referenced to rated power, @VR Master = Max),</li> <li>- EMG channel is unmuted – EMG signal triggered.</li> </ul>
	OFF	<ul style="list-style-type: none"> <li>- Amplifier below -45 dBr, and EMG channel muted.</li> </ul>
Peak	Red (solid)	<ul style="list-style-type: none"> <li>- Limiter triggered,</li> <li>- Clip occurred.</li> </ul>
	OFF	<ul style="list-style-type: none"> <li>- No limiter or clipping triggered.</li> </ul>
Protect	Red (solid)	<ul style="list-style-type: none"> <li>- Amplifier in protection mode,</li> <li>- SMPS in protection mode.</li> </ul>
	OFF	<ul style="list-style-type: none"> <li>- Amplifier and SMPS are not in protection mode.</li> </ul>
	Red (flashing)	<ul style="list-style-type: none"> <li>- Amplifier was switched from HiZ to LoW and is transitioning to low impedance mode</li> <li><b>Note:</b> all other LED will remain OFF during this period.</li> </ul>
Protect + Peak	Red + Red (flashing in alternative pattern)	<ul style="list-style-type: none"> <li>- The system is in dead-lock. After several attempts to restart, there is a fault still present.</li> <li><b>Note:</b> all other LED will remain OFF during this period.</li> </ul>

### 5.1.2 Set the mixer amplifier options

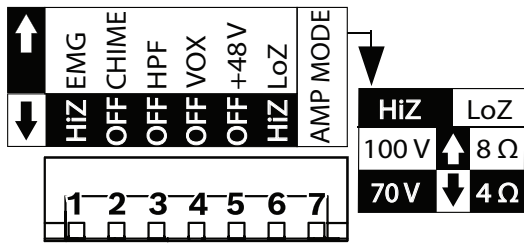


Figure 5.1: Mixer amplifier DIP-switch diagram

1	<b>EMG source</b>
	You can designate the source for emergency announcements, choosing between HiZ for 100 V operation or EMG for line-level input. This selection ensures seamless integration with emergency communication systems, facilitating clear and effective announcements during critical situations.
2	<b>Chime activation</b>
	With chime activation, you can opt to enable a chime sound (CHIME) to accompany the activation of the call-station. This audible cue provides immediate attention and acknowledgment, enhancing communication effectiveness in busy environments.
3	<b>High-pass filter activation</b>
	Enabling the high-pass filter (HPF) engages a 120Hz high-pass filter, effectively filtering out low-frequency signals from the audio output. This feature ensures clarity and fidelity by eliminating unwanted noise or rumble, particularly in speech or music applications.
4	<b>Voice override functionality</b>
	Voice override functionality (VOX) prioritizes voice input from Line/Mic 2 over other audio signals on AUX1 and AUX2 when activated. This ensures clear and uninterrupted communication during announcements or speeches, enhancing overall message clarity and comprehension.
5	<b>Phantom power supply</b>
	The option to enable phantom power (+48 V) provides a +48 V phantom power supply for both microphone inputs. This feature facilitates compatibility with condenser microphones, allowing users to utilize a wider range of microphones for their audio applications.
6	<b>Low/high output impedance selection</b>
	You can select between Low and High output impedance options, tailored to the impedance characteristics of the connected speaker setup. In HiZ mode, users choose between 70 V and 100 V operation, while in LoZ mode, they select between 4 ohm and 8 ohm operation, ensuring optimal compatibility with various speaker systems.
7	<b>Amplifier mode configuration</b>

The amplifier mode configuration allows you to fine-tune the amplifier operation to match their specific requirements. In HiZ mode, you can choose between 70 V and 100 V operation, ensuring seamless integration with high-impedance speaker systems. In LoZ mode, you have the flexibility to select between 4 ohm and 8 ohm operation, catering to low-impedance speaker setups. These configurable options empower you to optimize amplifier performance for their unique audio environments.

### 5.1.3 Set the power amplifier options

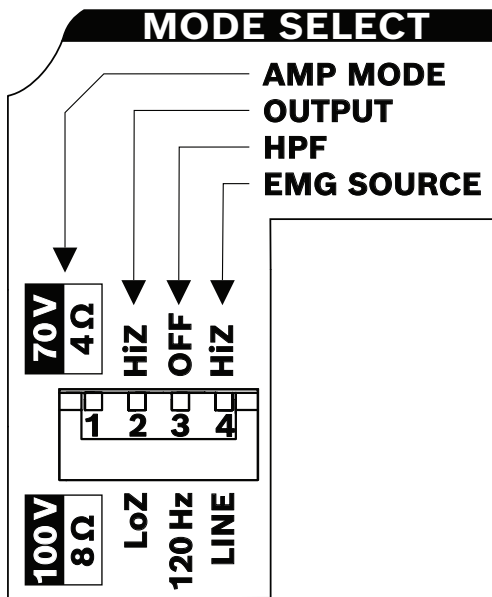


Figure 5.2: Power amplifier DIP-switch diagram

1	<p><b>Amplifier mode configuration</b></p> <p>The amplifier mode configuration allows you to fine-tune the amplifier operation according to their specific needs. In HiZ mode, you have the flexibility to select between 70 V and 100 V operation, ensuring seamless integration with high-impedance speaker systems. Conversely, in LoZ mode, you can choose between 4 ohm and 8 ohm operation, catering to low-impedance speaker setups. These configurable options empower users to optimize amplifier performance for their unique audio environments.</p>
2	<p><b>Low/High output impedance selection</b></p> <p>The selection between Low and High output impedance options determines the amplifier's output characteristics. If HiZ is chosen, the amplifier output will align with the selected impedance (70 V or 100 V) as specified in the Amp Mode dip-switch setting. Conversely, selecting LoZ configures the amplifier output for either 4 ohm or 8 ohm operation, again based on the Amp Mode dip-switch selection. This feature ensures compatibility with various speaker systems, allowing you to achieve optimal audio performance in their setups.</p>

3	<b>High-pass filter activation</b>
	Enabling the high-pass filter (HPF) activates a 120 Hz high-pass filter, effectively filtering out low-frequency signals from the audio output. This feature is particularly useful in applications where clarity and fidelity are paramount, ensuring that only desired frequencies are reproduced while eliminating unwanted noise or rumble.
4	<b>EMG source</b>
	You have the option to designate the source for emergency announcements, choosing between HiZ for 100 V operation or LINE for line-level input. This selection ensures seamless integration with emergency communication systems, facilitating clear and effective announcements during critical situations. Whether utilizing high-impedance speaker systems or line-level inputs, you can rely on the amplifier to deliver reliable emergency communication when needed most.

### 5.1.4 Main output

The output connector is a 4-pin Euroblock type connector. This allows for easy pre-wiring of the cables outside the rack and fast connection.



#### Warning!

It is not allowed to interconnect terminals of different channels!



#### Caution!

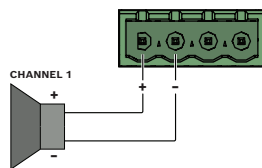
For compliance to UL 62368-1 and CAN/CSA C22.2 No. 62368-1, all loudspeakers wiring must be Class 2 wiring (CL2); this requirement does not apply for compliance to EN/IEC 62368-1.



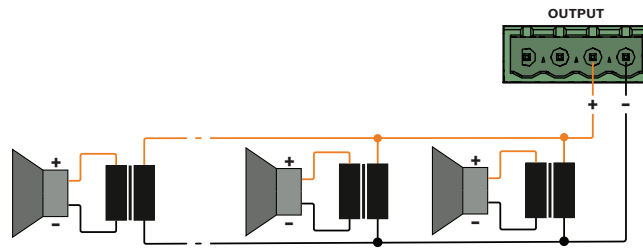
#### Caution!

Amplifier outputs may carry output voltages up to 100 V<sub>RMS</sub>. Touching uninsulated terminals or wiring may result in an unpleasant sensation. The external wiring of these terminals requires installation by an instructed person.

### LoZ 4 Ω / 8 Ω application



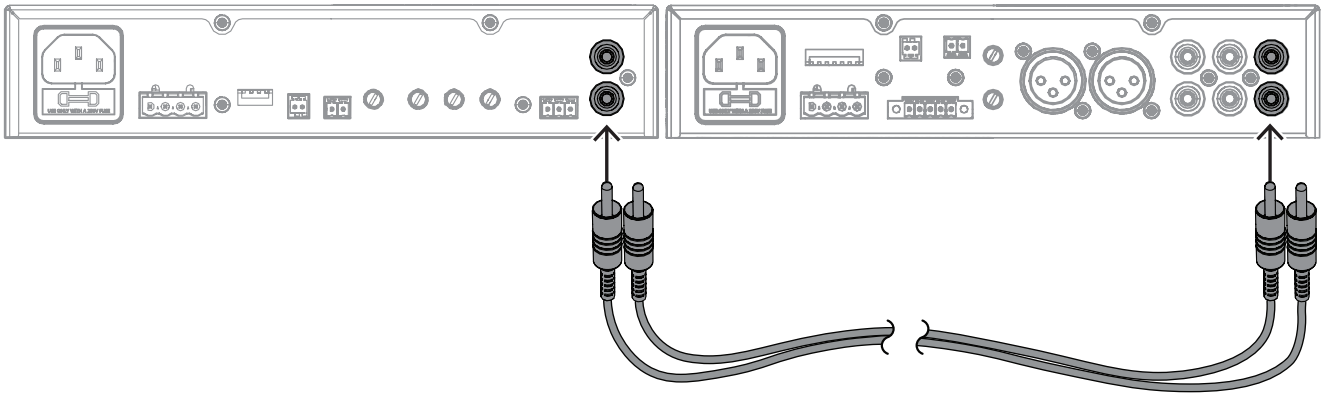
### HiZ 70 V / 100 V application



### 5.1.5

#### Line output

The Line Output on the Mixer amplifier allows for seamless connectivity to another amplifier. This single line output is designed to facilitate a direct connection to another device, such as the U Series Power Amplifier, via RCA connectors.



**Figure 5.3:** Mixer amplifier line output connection to Power amplifier line input

### 5.1.6

#### Remote OFF

Remote OFF provides a simple way to remotely power-off the amplifier in case of an emergency. This can be used by an external device or a simple switch that can be located away from the device for convenience.

- Leaving the pins of REMOTE OFF socket "open" (nothing connected) the device is ON.
  - See figure A below.
- When connecting the pins, the device is powered OFF.
  - See figure B below.

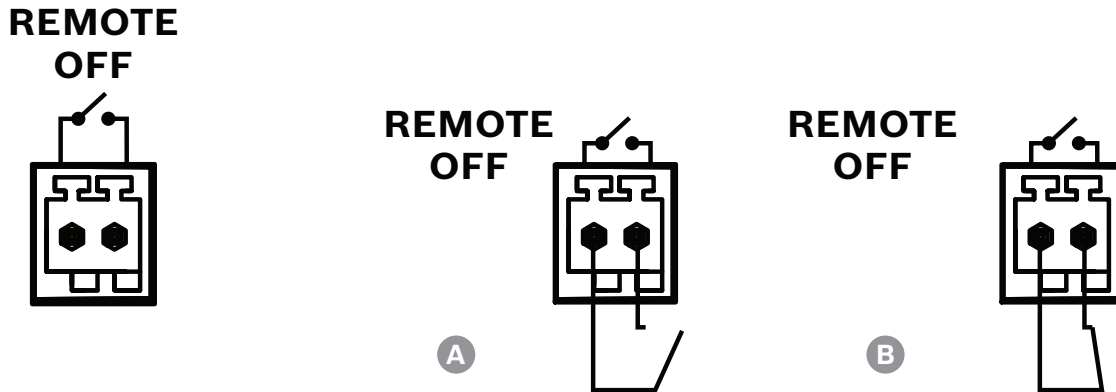


Figure 5.4: Remote OFF control input connector

### 5.1.7

#### Mains power

The amplifier receives its power supply via the MAINS IN connector. Only the provided power cord may be used. The amplifier is equipped with a wide range power supply. Relevant technical data regarding mains power consumption can be found on the product label on the rear-side of the amplifier.



#### Notice!

When power is restored, the device will continue in its last known mode of operation.



#### Caution!

During installation, always separate the amplifier from the mains socket! Only a correctly installed and grounded wall mains outlet must be used.

### 5.1.8

#### Chime legacy option

By default, the amplifier is configured to use the standard Dynacord 2-tone chime. However, a secondary legacy chime is also pre-programmed into the mixer amplifiers and can be activated using the following steps:

1. Power OFF the amplifier,
2. Set the Chime dipswitch setting to OFF,
3. Power ON the amplifier,
4. Within 10 seconds of powering ON the amplifier, toggle the Chime dipswitch ON and OFF three times (ON – OFF -> ON – OFF-> ON – OFF)

To revert to the standard Dynacord 2-tone chime, repeat the same steps outlined above.

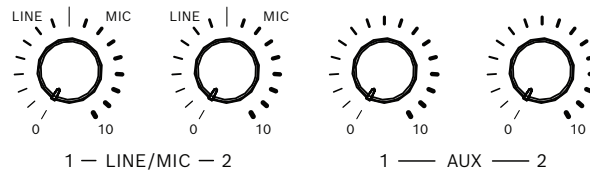


## 6 Operation after installation

### 6.1 Input level control

Equipped with individual input level control rotary knobs on the front panel, each channel offers precise adjustment of input sensitivity.

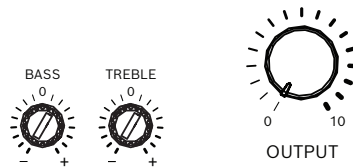
In this chapter, we explore the technical aspects of input level control, including the adjustment of the amplifier to the source.



**Figure 6.1:** Input level control rotary knobs for LINE/MIC and AUX gain (U30:1M, U60:1M, U120:1M, U240:1M)

### 6.2 Output control adjustment

Equipped with output level gain and Bass and Treble rotary knobs, the amplifier offers precise adjustment capabilities for optimizing audio output. These controls allow you to tailor the system's output to match the characteristics of their audio sources and environment.



**Figure 6.2:** Tonality adjustment rotary knobs for Bass/Treble and output level gain (U30:1M, U60:1M, U120:1M, U240:1M)

## 7 Troubleshooting

Problem	Possible cause	Solution
Amplifier does not turn on and power LED is not illuminated.	Power (plug) disconnected or the power source is giving insufficient power to the device.	Ensure power cord is securely connected to device and check the power from the mains.
Power LED is continuously blinking.	Start-up fault.	Contact service agent.
No audio signal (no front panel LED indication).	<ol style="list-style-type: none"> <li>1) Audio input cable has come loose or has not been properly plugged in.</li> <li>2) Input source is not sending signal or sufficient signal.</li> <li>3) Input level is turned down.</li> </ol>	<ol style="list-style-type: none"> <li>1) Check that the cables for any damage. Check that the cables are installed and wired correctly. Check that the wires are secured inside the connector, and the connector is fully plugged in and seated securely to the amplifier.</li> <li>2) Ensure that the input is turned up.</li> </ol>
No audio is coming out of the speakers, but the input LED indication shows there is signal.	<ol style="list-style-type: none"> <li>1) Output speaker cable has come loose or has not been properly plugged in.</li> <li>2) Maybe the output level control is not turned up.</li> </ol>	<ol style="list-style-type: none"> <li>1) Check that the cables for any damage. Check that the cables are installed and wired correctly. Check that the wires are secured inside the connector, and the connector is fully plugged in and seated securely to the amplifier.</li> <li>2) Pilot tone will usually not be audible, but the amplifier is still working correctly.</li> <li>3) Check that the output level control is not at the minimum position.</li> </ol>
Audio sounds distorted.	<ol style="list-style-type: none"> <li>1) Input level is too high or too low.</li> <li>2) Clipping of input stage.</li> <li>3) Music source is of poor quality.</li> <li>4) The amplifier is being overdriven by exceeding the max. output allowed (i.e. drained powerTANK).</li> </ol>	<ol style="list-style-type: none"> <li>1) Ensure that the source level is not too high or too low. This could mean re-adjusting the level on the amplifier.</li> <li>2) Check the quality of source material.</li> <li>3) Turn down or consider a bigger amplifier.</li> </ol>

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Audio sounds very muffled or lacks low frequencies.	<ol style="list-style-type: none"> <li>1) Maybe the 120 Hz high-pass filter is activated and this does not match to the connected speaker.</li> <li>2) Maybe the bass/treble setting does not match to the connected speaker.</li> </ol>	<ol style="list-style-type: none"> <li>1) Turn off the 120 Hz high-pass filter using the DIP-switch.</li> <li>2) Adjust the bass/treble EQ to match the connected speaker.</li> </ol>
Weak sound output, but with no fault indications.	Incorrectly wired input connectors.	Ensure that the input cables are correctly match to the polarity of the source (i.e. wired correctly).
Hum and hiss noise.	Interference on inputs due to unbalance cables or incorrect connections.	Suggest using balanced input cable wiring.
PROTECT and PEAK LEDs light up alternately.	<ol style="list-style-type: none"> <li>1) Speaker cable has a short or the cable is damaged.</li> <li>2) Incorrect AMP MODE selected.</li> <li>3) Internal amplifier channel malfunction.</li> <li>4) Connected HiZ speaker goes into saturation which leads to high output current.</li> <li>5) Connected load (inclusive cable) has a too high capacitance.</li> </ol>	<ol style="list-style-type: none"> <li>1) Check or replace speaker cables and ensure that connections are wired correctly.</li> <li>2) Select the appropriate AMP MODE for your speakers.</li> <li>3) Contact service agent.</li> <li>4) Switch on the 120 Hz high-pass filter.</li> <li>5) Reduce the gain in the audio path. Check the gain level position for LINE/MIC, AUX, EMG, BASS, TREBLE and OUTPUT.</li> </ol>
PROTECT LED lights up continuously.	Power supply shutdown because of over temperature protection.	Wait until the power supply temperature decreases. Use the device at lower ambient temperatures or reduce the output power.
PROTECT LED flashing (≈45 seconds)	The Amplifier mode changed from HiZ to LoZ.	Wait about 45 seconds until the PROTECT LED goes out and the power LED turns on.

## 8 Maintenance

This product has been designed to operate without problems for a long period of time, with a minimum of maintenance.

In order to guarantee trouble-free operation periodically:

- Clean all units with a damp, lint-free cloth; never use water or chemicals.
- Vacuum the air vents to ensure good ventilation.
- Check all cable connections for corrosion and the screw terminals to make sure that they have not become loosened.
- Check the ground (PE) connection of the system components.

## 9

## Technical data

U120:1 | U240:1

### Electrical

<b>Mains power supply</b>	
	<b>U120:1</b>
Voltage	100 VAC - 240 VAC, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	1.25 W
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	9 W / 11 W
– Idle mode HiZ amp mode (70 V / 100 V)	13 W / 17 W
– 1/8 rated output power	35 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Mains power supply</b>	
	<b>U240:1</b>
Voltage	100 VAC - 240 VAC, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	1.25 W
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	10 W / 11 W
– Idle mode HiZ amp mode (70 V / 100 V)	10 W / 13 W
– 1/8 rated output power	50 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Performance U120:1   U240:1</b>	
<b>Frequency response, -3 dB ref. 1 kHz</b>	
- Any input to output	<20 Hz – 20 kHz
- EMG input to output	<20 Hz – 18 kHz
Distortion	<0.5% @rated output power, 1 kHz
Output stage topology	Class D
<b>Equalization</b>	
Bass shelving	±12 dB / 100 Hz
Treble shelving	±12 dB / 10 kHz
<b>Filter</b>	
- LO-CUT permanently	f=20 Hz, 12 dB/oct.
- HI-PASS (HPF) switchable, can be activated	f=120 Hz, 12 dB/oct.

<b>General</b>	
<b>Front status LEDs</b>	
- Protect (Red)	Protection
- Peak (Red)	1 dB before clip (input and output)
- Signal (Green)	Input and output signal
- Call (Green)	EMG
- Power (Green)	Power on condition
DIP switches	EMG (HiZ/Line level), HPF (120 Hz), Output (HiZ/LowZ), Amp mode (70 V/100 V; 4Ω/8Ω)
<b>Protections</b>	
- Amplifier	Audio limiters, high temperature, DC, HF, short circuit, over current protection
- Switching mode power supply	Mains over/under voltage protection, inrush current limiter, mains over current, high temperature
- Remote power OFF	Contact closure

<b>Inputs</b>	
Number of inputs	1 balanced line, 1 unbalanced line, EMG (priority input)
<b>Input 1</b>	
Type	Balanced line
Connector	3-pin Eurostyle

<b>Inputs</b>	
Sensitivity	500 mV
Impedance	10 k $\Omega$
Maximum input level	+12 dBu
<b>Input 2</b>	
Type	Unbalanced line
Connector	RCA (chinch), stereo converted to mono
Sensitivity	250 mV (R and L)
Impedance	4.7 k $\Omega$
Maximum input level	+16 dBu (R and L)
<b>EMG Input</b>	
Type	Line; 100 V
Connector	2-pin, balanced
Impedance	
– EMG (line)	>15 k $\Omega$
– EMG (HiZ)	>470 k $\Omega$
Maximum input level	
– EMG (line)	+11.5 dBu
– EMG (HiZ)	+44.5 dBu

<b>Loudspeaker output U120:1</b>				
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)			
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	120 W			
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB			
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 <math>\Omega</math></b>	<b>8 <math>\Omega</math></b>	<b>70 V</b>	<b>100 V</b>
	22 V <sub>RMS</sub>	32 V <sub>RMS</sub>	71 V <sub>RMS</sub>	102 V <sub>RMS</sub>

<b>Loudspeaker output U240:1</b>	
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	240 W
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB

<b>Loudspeaker output U240:1</b>				
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 Ω</b>	<b>8 Ω</b>	<b>70 V</b>	<b>100 V</b>
	31 V <sub>RMS</sub>	45 V <sub>RMS</sub>	71 V <sub>RMS</sub>	102 V <sub>RMS</sub>

### Mechanical

<b>Enclosure</b>	<b>U120:1</b>	<b>U240:1</b>
IEC protection class	Class I (grounded)	
Dimensions (HxWxD), without accessories	44.2 mm x 218 mm x 210 mm (1.74 in x 8.6 in x 8.26 in)	
Color in RAL	RAL 9017 Traffic black	
Net weight (without accessories)	1.8 kg (3.96 lb)	
Net weight (with accessories)	2.3 kg (5.07 lb)	
Shipping weight	2.6 kg (5.73 lb)	
Mounting	Stand-alone; 19" rack; rack side-by-side; half 19" rack; table-top; under-table	

### Environmental

<b>Climatic conditions</b>	<b>U120:1</b>	<b>U240:1</b>
Cooling concept	Four-stage-fans (Off / Slow / Medium / Fast)	
Operating temperature	-5°C – 45°C (23°F – 113°F)	
Storage temperature	-40°C – 70°C (-40°F – 158°F)	

### U30:1M | U60:1M | U120:1M | U240:1M

#### Electrical

<b>Mains power supply</b>	
	<b>U30:1M</b>
Voltage	100 VAC - 240 VAC, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	0.6 W



<b>Mains power supply</b>	
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	6 W / 6 W
– Idle mode HiZ amp mode (70 V / 100 V)	6 W / 6 W
– 1/8 rated output power	15 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Mains power supply</b>	
	<b>U60:1M</b>
Voltage	100 VAC - 240 VAC $\pm$ 10%, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	0.6 W
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	6 W / 6 W
– Idle mode HiZ amp mode (70 V / 100 V)	6 W / 6 W
– 1/8 rated output power	20 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Mains power supply</b>	
	<b>U120:1M</b>
Voltage	100 VAC - 240 VAC, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	1.25 W
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	9 W / 12 W

<b>Mains power supply</b>	
– Idle mode HiZ amp mode (70 V / 100 V)	14 W / 18 W
– 1/8 rated output power	40 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Mains power supply</b>	
	<b>U240:1M</b>
Voltage	100 VAC - 240 VAC $\pm$ 10%, 50/60 Hz
<b>Power consumption</b>	
– Standby (Remote OFF active)	1.25 W
– Idle mode LoZ amp mode (4 $\Omega$ / 8 $\Omega$ )	10 W / 12 W
– Idle mode HiZ amp mode (70 V / 100 V)	10 W / 14 W
– 1/8 rated output power	55 W
Remote power (ON/ OFF Stand by)	2-pin, Eurostyle, contact closure

<b>Performance U30:1M   U60:1M</b>	
<b>Frequency response, -3 dB ref. 1 kHz</b>	
– Any input to output	70 Hz – 18 kHz
– EMG input to output	80 Hz – 15 kHz
– Any input to LINE output	<10 Hz – 60 kHz
Distortion	<0.5% @rated output power, 1 kHz
Output stage topology	Class D
<b>Equalization</b>	
– Bass shelving	$\pm$ 12 dB / 100 Hz
– Treble shelving	$\pm$ 12 dB / 10 kHz
<b>Filter</b>	
– LO-CUT permanently	f=70 Hz, 12 dB/oct.

<b>Performance U30:1M   U60:1M</b>	
– HI-PASS (HPF) switchable, can be activated	f=120 Hz, 12 dB/oct.

<b>Performance U120:1M   U240:1M</b>	
<b>Frequency response, -3 dB ref. 1 kHz</b>	
– Any input to output	<20 Hz – 20 kHz
– EMG input to output	<20 Hz – 15 kHz
– Any input to LINE output	<10 Hz – 60 kHz
Distortion	<0.5% @rated output power, 1 kHz
Output stage topology	Class D
<b>Equalization</b>	
– Bass shelving	±12 dB / 100 Hz
– Treble shelving	±12 dB / 10 kHz
<b>Filter</b>	
– LO-CUT permanently	f=20 Hz, 12 dB/oct.
– HI-PASS (HPF) switchable, can be activated	f=120 Hz, 12 dB/oct.

<b>General</b>	
<b>Front status LEDs</b>	
– Protect (Red)	Protection
– Peak (Red)	1 dB before clip (input and output)
– Signal (Green)	Input and output signal
– Call (Green)	EMG / priority trigger / Vox input active
– Power (Green)	Power on condition
DIP switches	EMG (HiZ/Line level), Two-tone Chime (ON/OFF), HPF (120 Hz), VOX (ON/OFF), Phantom power (+48 V/OFF) Output (HiZ/LoZ), Amp mode (70 V/100 V; 4Ω/8Ω)
<b>Protections</b>	
– Amplifier	Audio limiters, high temperature, DC, HF, short circuit, over current protection
– Switching mode power supply	Mains over/under voltage protection, inrush current limiter, mains over current, high temperature
– Remote power OFF	Contact closure

<b>Inputs</b>	
Number of inputs	2 mic/line, 2 aux, EMG (priority input)
<b>Sensitivity with all level controls in max. position</b>	
– MIC / Call station	-68 dBu (300 $\mu$ V)
– AUX (only L or R)	-11.8 dBu (200 mV)
– AUX (Stereo) (L and R)	-17.8 dBu (100 mV)
<b>Maximum input level</b>	
– LINE / MIC	+7.5 dBu
– AUX (L or R)	+22 dBu
– AUX (L and R)	+16 dBu
– EMG (EMG line)	+11.5 dBu
– EMG (HiZ 100 V)	+44.5 dBu
<b>Input impedances</b>	
MIC / Call station	10 k $\Omega$
AUX	4.7 k $\Omega$
EMG (Line)	>15 k $\Omega$
EMG (HiZ)	>470 k $\Omega$
<b>LINE / MIC1 input</b>	
Type	LINE / MIC, call station, contact override with chime
Connector	3-pin XLR, balanced / 5-pin Eurostyle, balanced (3 pin for input, 2 pin for trigger)
Dynamic range	60 dB (Mic gain min – max)
Equivalent input noise	<-115 dBu
Phantom power supply, switchable	48 V DC
<b>LINE / MIC2 input</b>	
Type	Mic/Line, VOX ducker override
Connector	3-pin XLR, balanced
VOX Ducking	Ducking control 0 dB – 45 dB
VOX Threshold	-60dBu – +8 dBu, adjustable via MIC2 level control
Dynamic range	60 dB (Mic gain min – max)
Equivalent input noise	<-115 dBu
Phantom power supply, switchable	48 V DC
<b>AUX1 input</b>	

<b>Inputs</b>	
Type	Line
Connector	RCA (cinch), stereo converted to mono, unbalanced
<b>AUX2 input</b>	
Type	Line
Connector	RCA (cinch), stereo converted to mono, unbalanced
<b>EMG Input</b>	
Type	Line; 100 V
Connector	2-pin, balanced

<b>Loudspeaker output U30:1M</b>				
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)			
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	30 W			
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB			
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 Ω</b>	<b>8 Ω</b>	<b>70 V</b>	<b>100 V</b>
	12 V <sub>RMS</sub>	16 V <sub>RMS</sub>	87 V <sub>RMS</sub>	118 V <sub>RMS</sub>

<b>Loudspeaker output U60:1M</b>				
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)			
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	60 W			
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB			
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 Ω</b>	<b>8 Ω</b>	<b>70 V</b>	<b>100 V</b>
	16 V <sub>RMS</sub>	22 V <sub>RMS</sub>	86 V <sub>RMS</sub>	117 V <sub>RMS</sub>

<b>Loudspeaker output U120:1M</b>	
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	120 W
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB

<b>Loudspeaker output U120:1M</b>				
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 Ω</b>	<b>8 Ω</b>	<b>70 V</b>	<b>100 V</b>
	22 V <sub>RMS</sub>	32 V <sub>RMS</sub>	71 V <sub>RMS</sub>	102 V <sub>RMS</sub>

<b>Loudspeaker output U240:1M</b>				
Connector	4-pin Eurostyle (2 pin for LoZ, 2 pin for HiZ)			
Output power according IHF-A-202 (Dynamic-Headroom, burst 1 kHz / 20 ms on / 480 ms off / low level -20 dB)	240 W			
Signal to noise ratio (A-weighted, ref. to rated output power)	>100 dB			
Max output voltage, 1 kHz, THD=0.5%, no load	<b>4 Ω</b>	<b>8 Ω</b>	<b>70 V</b>	<b>100 V</b>
	31 V <sub>RMS</sub>	45 V <sub>RMS</sub>	71 V <sub>RMS</sub>	102 V <sub>RMS</sub>

### Mechanical

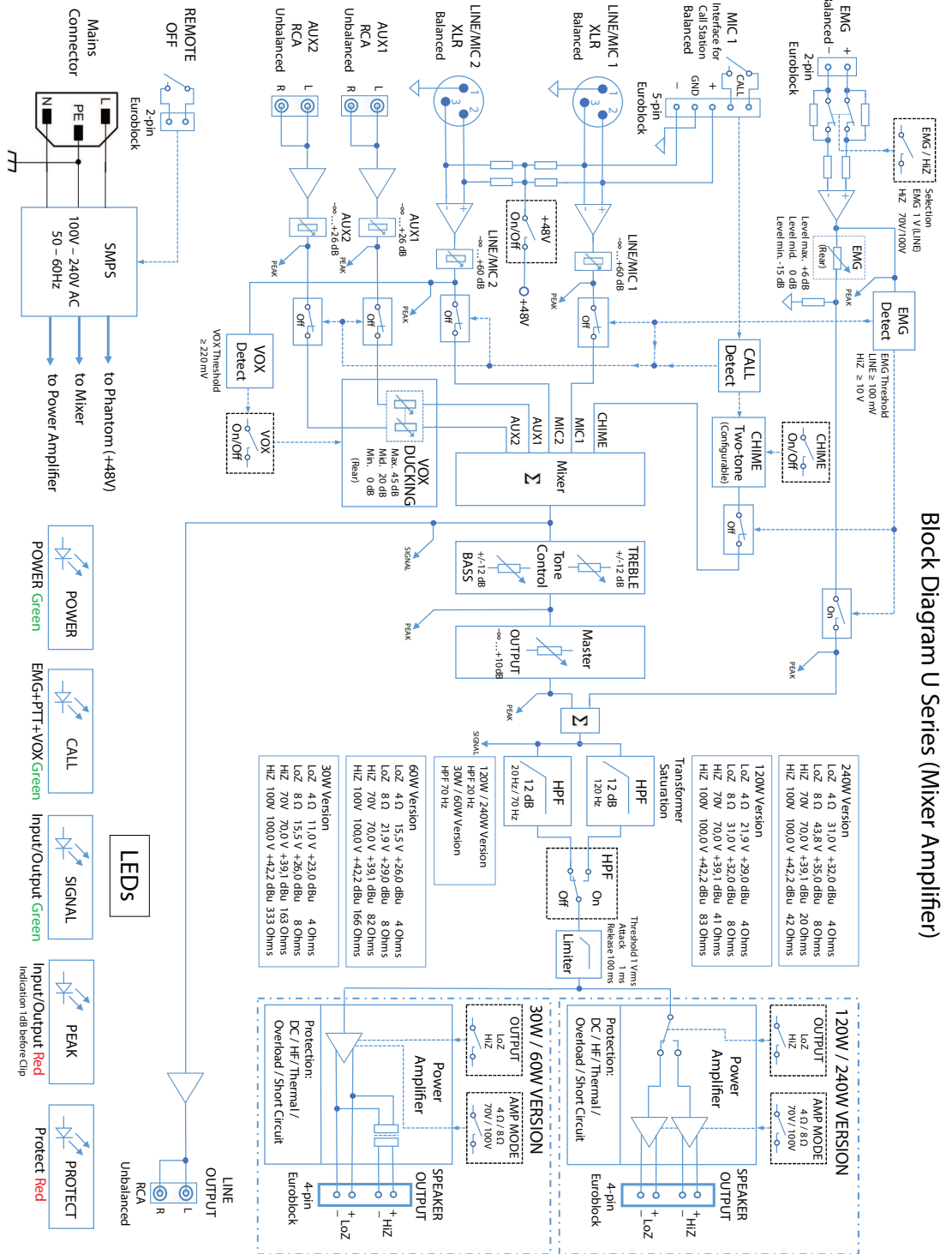
<b>Enclosure</b>	<b>U30:1M</b>	<b>U60:1M</b>	<b>U120:1M</b>	<b>U240:1M</b>
IEC protection class	Class I (grounded)			
Dimensions (HxWxD), without accessories	44.2 mm x 218 mm x 217.7 mm (1.74 in x 8.6 in x 8.57 in)			
Color in RAL	RAL 9017 Traffic black			
Net weight (without accessories)	2.2 kg (4.85 lb)	2.5 kg (5.51 lb)	1.9 kg (4.18 lb)	
Net weight (with accessories)	2.7 kg (5.95 lb)	3.0 kg (6.61 lb)	2.4 kg (5.29 lb)	
Shipping weight	3.1 kg (6.83 lb)	3.4 kg (7.49 lb)	2.8 kg (6.17 lb)	
Mounting	Stand-alone; 19" rack; rack side-by-side; half 19" rack; table-top; under-table			

### Environmental

<b>Climatic conditions</b>	<b>U30:1M</b>	<b>U60:1M</b>	<b>U120:1M</b>	<b>U240:1M</b>
Cooling concept	Fanless (convection cooling)		Four-stage-fans (Off / Slow / Medium / Fast)	

<b>Climatic conditions</b>	<b>U30:1M</b>	<b>U60:1M</b>	<b>U120:1M</b>	<b>U240:1M</b>
Operating temperature	-5°C – 45°C (23°F – 113°F)			
Storage temperature	-40°C – 70°C (-40°F – 158°F)			

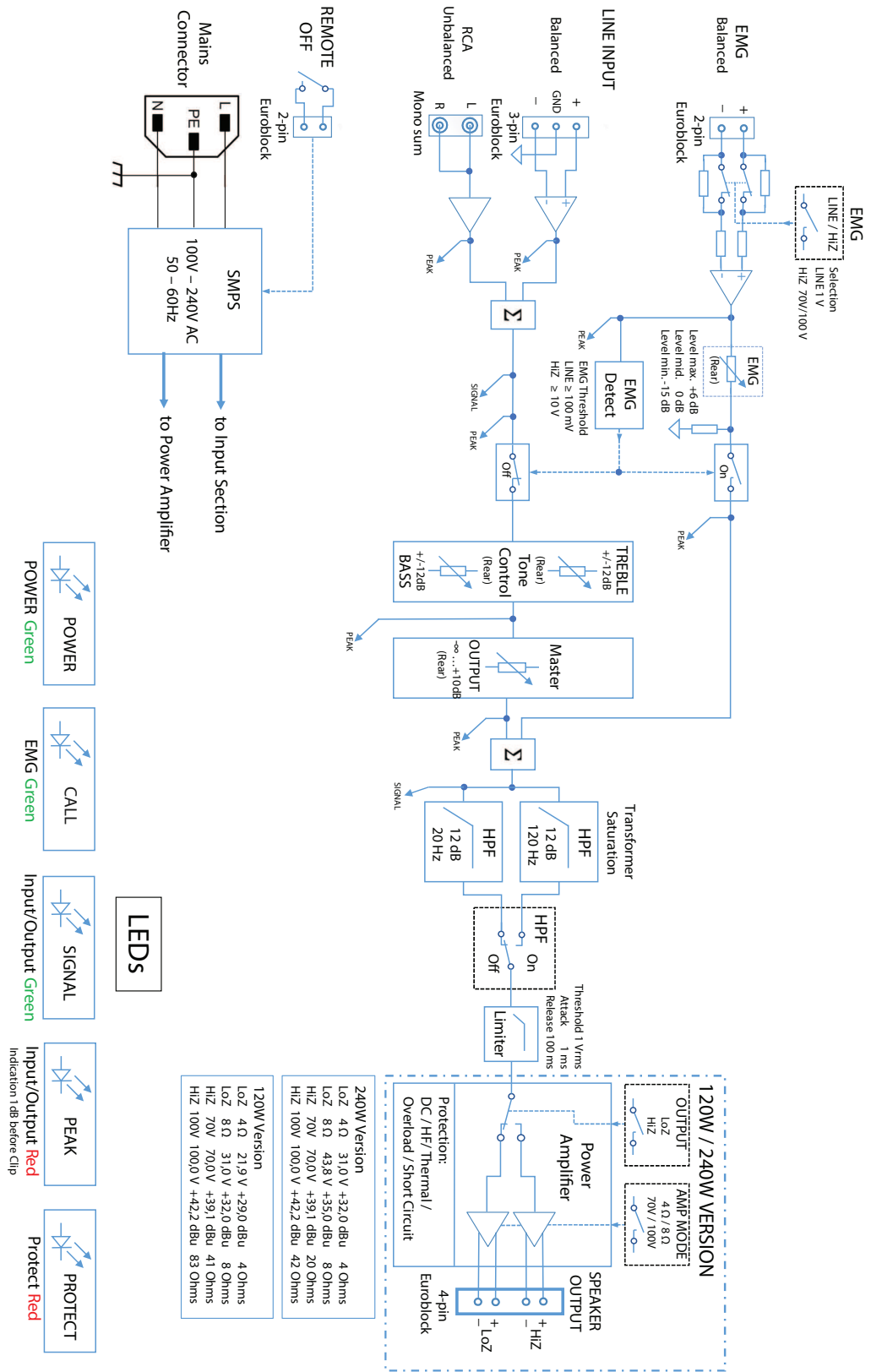
# 10 Mixer amplifier block diagram





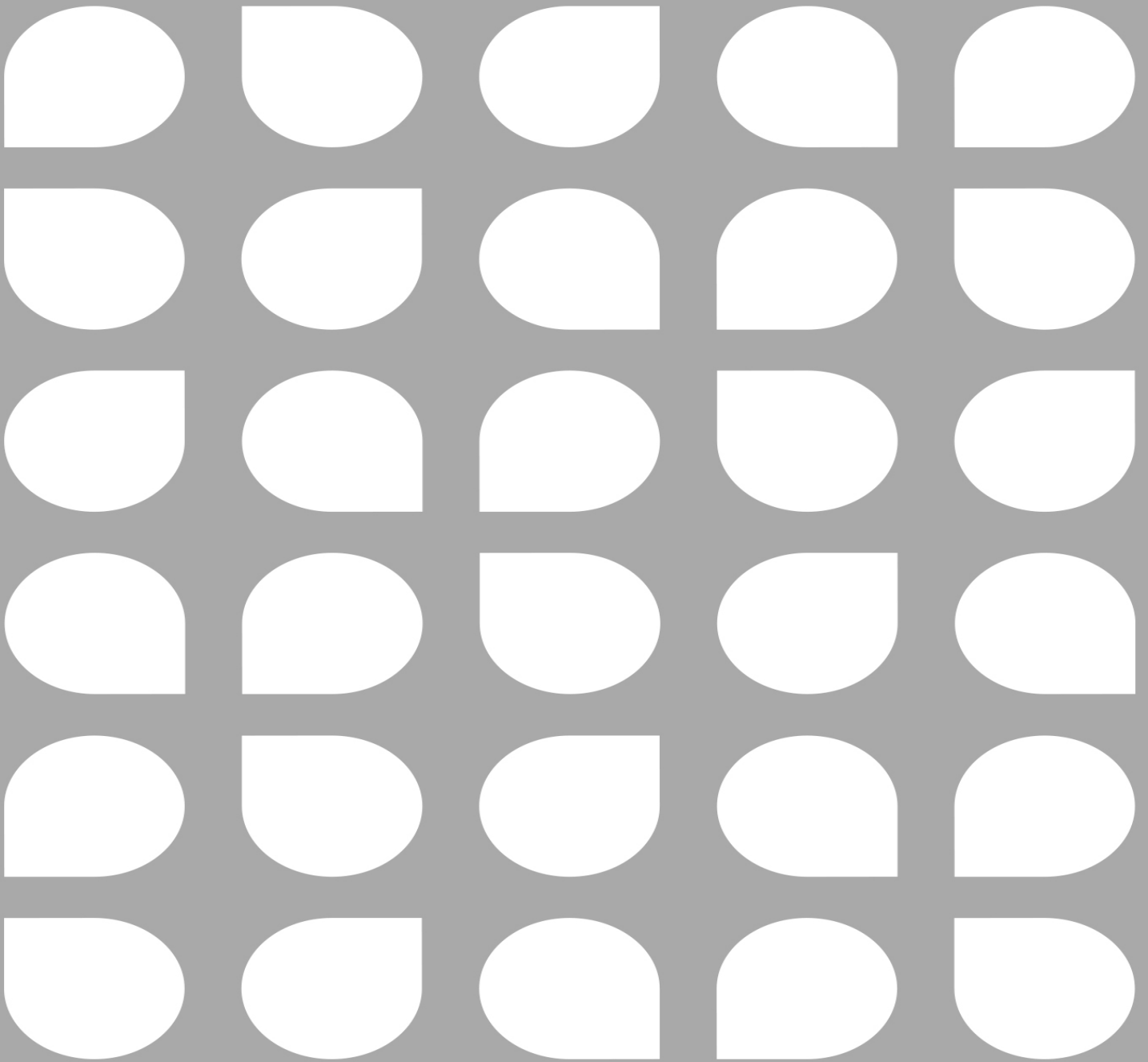
# 11 Power amplifier block diagram

Block Diagram U Series (Power Amplifier)









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