JONAS HELLBORG SIGNATURES **MANUAL**

WARWICK AMPLIFICATION

INDEX

1

P 04 RECOMMENDATION
P 05 INTRODUCTION

2 PREAMP

P 07 PREAMP
P 08 QUICK START
P 09-10 OPERATING INSTRUCTIONS
P 11 SIMPLIFIED SCHEMETIC
P 12 TECHNICAL SPECIFICATIONS
P 13 EQ-GRAPHS

3 POWER AMPLIFIERS

P 15 POWER AMPLIFIERS
P 16-17 OPERATING INSTRUCTIONS MONO POWER 250W/500W
P 18-19 OPERATING INSTRUCTIONS STEREO POWER 2/250W
P 20 RACK MOUNTING
P 21 PROTECTIVE CIRCUITS
P 22 TECHNICAL SPECIFICATIONS
P 23 SIMPLIFIED SCHEMATICS

4 CABINETS

P 25-26 CABINETS
P 27 TECHNICAL SPECIFICATIONS

5 COMBINATION POSSIBILITIES

P 28-29 COMBINATION POSSIBILITIES
P 30 WIRING EXAMPLES

The following recommendations are to ensure that the device always functions reliably:
Never open the casing! To do so would expose you to the risk of an electric shock. Should repairs prove necessary, leave them to qualified service personnel. Avoid dust and high moisture levels, direct sunlight and extremely high or low temperature. Safeguard the device from excessive vibration. Always place the unit on a stable and horizontal surface. See to adequate ventilation. The device should not be placed on soft surfaces (carpet, cushions, etc.). When mounting it in a rack, make sure that the cooling vents remain unobstructed. Avoid leaving the unit near radiators or other objects producing heat. Internal components should only be adjusted or cleaned by qualified service technicians. Ensure no object or liquid penetrates the device through its cooling vents. When replacing a fuse make sure you fit in one of identical value! Have the device examined by a qualified service technician in the following cases: the mains lead or mains switch have been damaged, objects or liquids have penetrated the device, it has been exposed to excessive moisture, malfunctions or abnormal operating conditions have occurred, the device has been dropped or the casing damaged.
This apparatus shall not be exposed to dripping or splashing. No objects filled with liquids, such as vases, shall be placed on the apparatus. This apparatus should be connected to a MAINS socket outlet with a protective earth connection. If the apparatus shows any malfunction, immediately disconnect the main power cord from the mains socket. Remove the plug whenever changing a fuse. Only ever replace a fuse with another of the same type. Never bridge defective fuses. Make sure the top and bottom of the device are properly ventilated and that the vents are not blocked. Do not subject the device to excessive vibration or hard jolts as these could damage the device. Don't undertake repairs yourself. Only allow the case to be opened by qualified personnel. (Remove the plug). Repairs should only be undertaken by qualified personnel.
Please read through these instructions before connecting and operating the device. If you keep to the guidelines set out in this manual, you will soon be able to appreciate the excellent quality of the new Jonas Hellborg Series. Please keep this instruction booklet handy in case you need to consult it again.

INTRODUCTION

Welcome to the Warwick family and congratulations to the purchase of one of our fine Amps.
The Jonas Hellborg Series of Bass amplification products is designed to be the highest quality system of amps specifically for bass available today. There is truly no musical challenge that will present a problem for this extraordinary range of products. As we all know every manufacturer claims to be producing the greatest and most uncompromising products, and we are sure everyone has the best intent and believes in what they do. However the level of circuitry and design solutions applied here are in the league of top of the line recording studio products rather than normal amplifiers so for the moment, until the competition catches up we are in a league of our own. We sincerely hope you will get many years of happy use out of your Amp(s) and Speaker(s).

GENERAL POINTS

Throughout the conception evolution and manufacture of the "Hellborg Amp System" quality of sound, craftsmanship and aesthetics have been solid priorities. Of course sound is the number one issue in any musical instrument, and yes the amplifier is without a doubt an integral part of the instrument. The main problem of "old style" bass amps is in the lack of what one expects a bass being capable of producing. Both in regards to dynamics and frequency range. So internal headroom, range of equalizers, dynamic power reserves of Power Amps and range and quality of Speaker Cabinets have all been sadly short of the mark. Whatever your musical genre these amps can handle anything you put into them and the sound coming out of the speakers will make you a happier bassist. We believe that the amp has to look as incredible as it sounds. So much work has gone in to designing a rig that will make you proud just by looking at it, every time you look at it.



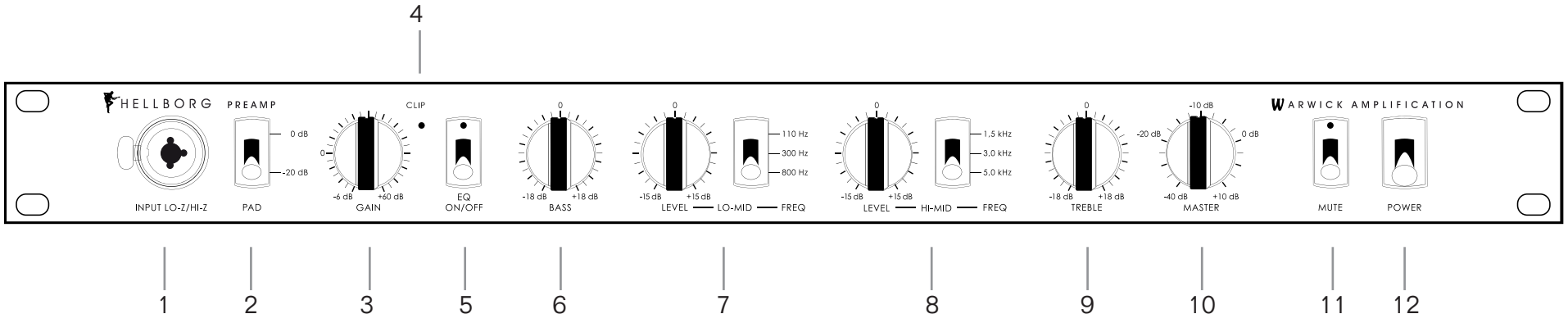
The centre piece of the "Hellborg Amp System" is the Preamp.
The input is a combined ¼"/XLR jack providing both low (XLR) and high (¼") impedance. The input jack is followed by an input transformer. This imparts galvanic signal isolation and the sweetness for which good transformers are known. The EQ section provides shelving EQ for high and low band and an inductive (coil based) EQ for the mids with stepped (fixed) frequency and continuously variable gain. Choices of frequencies are as follows: 110, 300 and 800Hz for low mids, 1.5, 3 and 5kHz for high mids. All transformers and coils are optimally shielded in MU-metal housing. The DI output amp is driving a carefully configured output transformer for the warmest recording or PA sound.

Safety Appliances

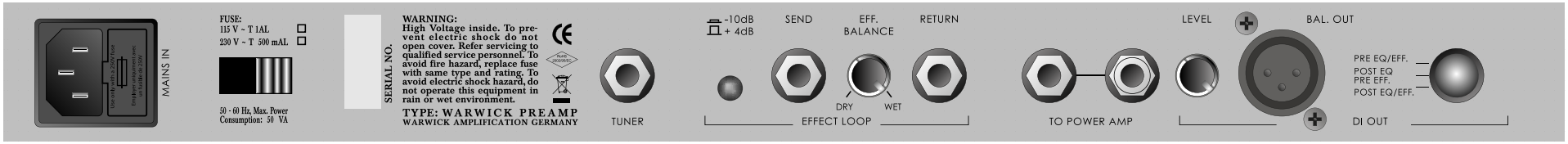
Warning: High Voltage inside. To prevent electric shock do not open cover. Refer servicing to qualified service personnel. To avoid fire hazard, replace fuse with same type and rating. To avoid electric shock hazard, do not operate this equipment in rain or wet environment.

1. Make sure that the Power Amplifier load is matched to the connected loudspeakers load.
   We recommend using speaker cables with lockable coaxial connectors that meet a cross-section of at least 2 x 1.5 mm.
2. Check that the mains supply has been plugged in and that the connection Pre- to Power- Amplifier is correct.
3. Make sure that external (effects) units possibly used are correctly connected and operational.
4. Set the MASTER controls (Pre- and Power Amplifier) to zero.
5. Plug your bass guitar into the Preamp's INPUT with a shielded line-cable.
6. Press the POWER switch to turn on the units.
7. Switch MUTE off and the red LED will extinguish.
8. Turn all volume controls of your bass guitar on to their maximum.
9. Adjust the GAIN control until the CLIP LED flashes green (Note PAD -20dB switch). The clip LED turning red indicates clipping
10. Set the LEVEL on the Power Amplifier to 5 and slowly increase the MASTER volume to a pleasing level.
11. Dial in the sound you want using the controls, described in their respective chapters.
12. If necessary readjust GAIN setting. Green indicates correct operating level, red indicates distorted signal.

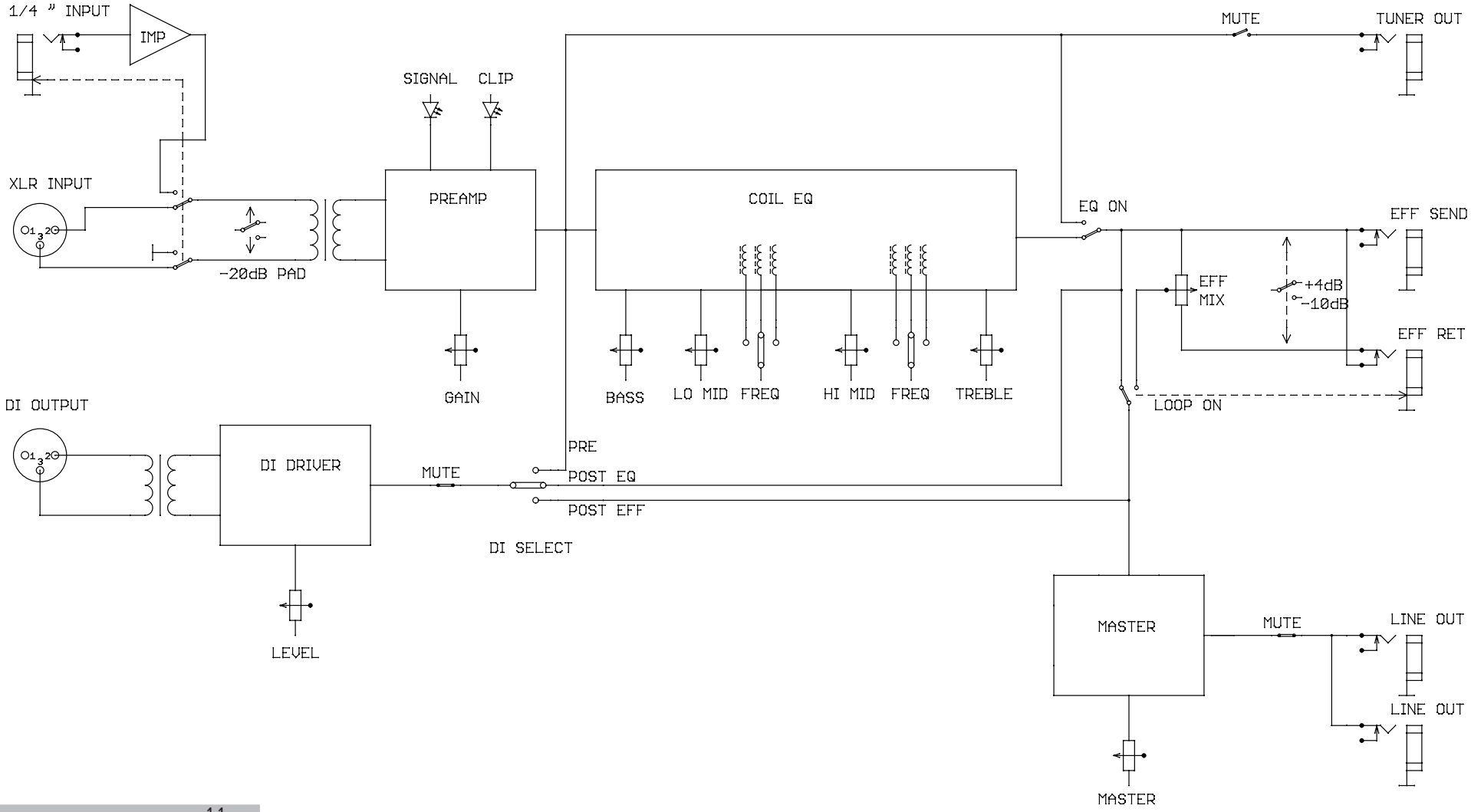
PREAMP



1. **Input Jack** This Neutrik© Combo Connector provides an unbalanced ¼" and balanced XLR input. The ¼" jack is used for all normal basses. The balanced XLR input is for instruments with balanced outputs.
2. **PAD Switch** Some instruments have an unusual low output level. If you own such an instrument, it may be necessary to disengage the -20dB PAD to match the correct signal level with this Preamp. Note that the PAD should normally be engaged.
3. **Gain** (-6dBu to +60dBu) This control regulates and controls the gain in the whole system. The actual settings for this control will depend on the output level of the instrument being used.
4. **Clip LED** Green indicates the correct operational level and red indicates clipping.
5. **EQ (On/Off) Switch** This switch bypasses the EQ-Section. The Control LED above the switch indicates the status.
6. **Bass** This adjusts the amount of Bass rates by 40Hz ±18dB. The Bass-Filter is shelving type that provides 6dB per octave rising or falling curve shapes.
7. **Lo-Mid Level** This adjusts the amount of Lo-Mid rates depending on the selected frequency. The selectable frequencies are 110, 300 and 800Hz ±15dB.
8. **Hi-Mid Level** This adjusts the amount of Lo-Mid rates depending on the selected frequency. The selectable frequencies are 1.5, 3 and 5kHz ±15dB.
9. **Treble** This adjusts the amount of Treble rates by 15kHz ±18dB. The Treble-Filter is shelving type that provides 6dB per octave rising or falling curve shapes.
10. **Master Control** This sets the signal level of the "TO POWER AMP" outputs. It should be set at -40dB when switching on the Preamp and turned up to the desired playing volume.
11. **Mute Switch** Pressing this switch will mute Line out and DI out. Its status is shown on the red LED above the switch. The mute function is useful when changing instruments or if a tuner is connected to the TUNER out, for tuning up silently.
12. **Power Switch** This switch is to turn on the unit. The switch will be illuminated when the Preamp power is on.



1. **IEC Socket and Fuse Holder** This is the socket for plug in the line cord. The fuse tray contains the main fuse of the Preamp. Replace the fuse only with the same type and size.
2. **Voltage Selector Switch** This switch is set at the factory to the correct voltage for your country. It can easily be changed to 230V or 115V by switching to the correct position. Fuse values are T500mAL for 230V and T1AL for 115V. Note when the wrong voltage value is set, there is a serious risk of damage to the unit if this is done incorrectly.
3. **Tuner** This is an output for connecting a Tuner. The signal from this output is identical to the instruments signal.
4. **Effect Loop** This part is for connecting effect units to the Preamp. The **Send** jack will be connected to the effect unit input and the **Return** to the effect unit output. The **Balance Control** adjusts between serial and parallel mode. If the control is turned to wet the signal will be fully processed. Turned to dry direction adjusts the mix of the effect loop. The sensitivity is switchable between +4dB and -10dB.
5. **To Power Amp** These are two Line Out jacks for connecting the Power Amplifiers.
6. **DI Out** The DI Output is for connecting the Preamp to P.A. systems or recording consoles. The level control sets the amount of the signal that appears at the output of the XLR connector. The DI Selector allows different settings for the DI output signal. In the PRE EQ/EFF position is the sound uncoloured. The signal is immediately taken after the input and gain section. By POST EQ/PRE EFF the signal is taken after the equalizer section but before EFFECT SEND. The sound will be affected by the equalizer section. By POST EQ/EFF is the signal taken after the equalizer section and effect loop. The sound will be affected by the equalizer and connected effect units. Wiring of the XLR connector is: pin 1 = ground(GND), pin 2 = +(hot), pin 3 = -(cold).

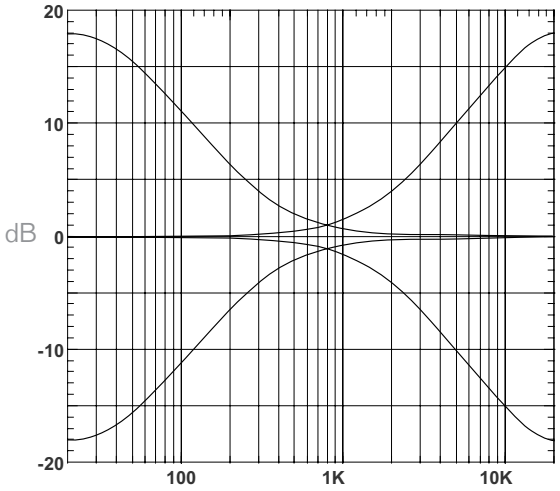

1/4 " INPUT
IMP
XLR INPUT
-20dB PAD
SIGNAL
CLIP
PREAMP
GAIN
COIL EQ
BASS
LO MID
FREQ
HI MID
FREQ
TREBLE
MUTE
TUNER OUT
EQ ON
EFF SEND
EFF
MIX
+4dB
-10dB
EFF RET
LOOP ON
DI OUTPUT
DI DRIVER
LEVEL
MUTE
PRE
POST EQ
POST EFF
DI SELECT
MASTER
MUTE
LINE OUT
LINE OUT
MASTER

Input sensitivity	
Level range	-6dBu to +60dBu
PAD	-20dB
Input Impedance	
HI-Z	500kΩ
LO-Z	600Ω
Filter Section	
Bass	*Type:* 6dB/oct. Shelving *Gain:* ±18dB at 40Hz
Lo-Mid	*Type:* 6dB/oct. Bandpass Filter, Selectable Frequencies 110Hz, 300Hz and 800Hz *Gain:* ±15dB
Hi-Mid	*Type:* 6dB/oct. Bandpass Filter, Selectable Frequencies 1,5kHz, 3kHz and 5kHz *Gain:* ±15dB
Treble	*Type:* 6dB/oct. Shelving *Gain:* ±18dB at 15kHz
Effect Send	
Impedance	600Ω
Output Level	Selectable +4dB/-10dB
Effect Return	
Impedance	10kΩ
Nominal Input Level	Selectable +4dB/-10dB

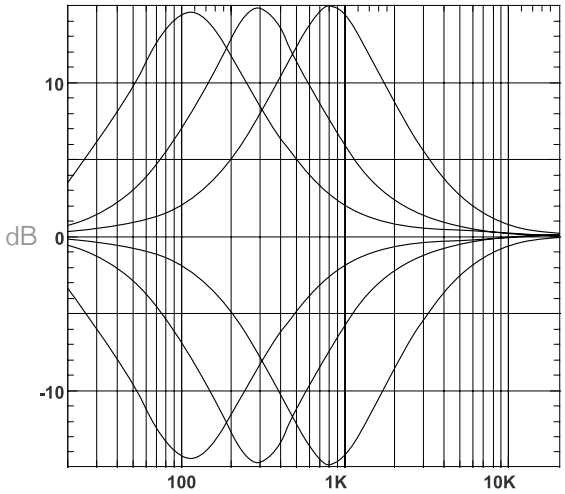
Tuner Out Level	
Nominal Output	4dBu
Line Out Level	
Impedance	600Ω
Nominal Output Level	0dBu
DI Output	
Impedance	600Ω
Output Level	-15dBu to +6dBu
Frequency Response	20Hz – 20kHz, -0.5dB
SNR	> 85dB below full conduction
THD+N at 1kHz	< 0,07%
Auxiliary	
Mains Protection	T500mAL (230V), T1AL (115V)
Dimensions (W/H/D)	19" / 1HE / 9,2" (233mm)
Weight	10 lb (4,5kg)
Content	IEC supply cable, owners manual, hexagon socket

PREAMP

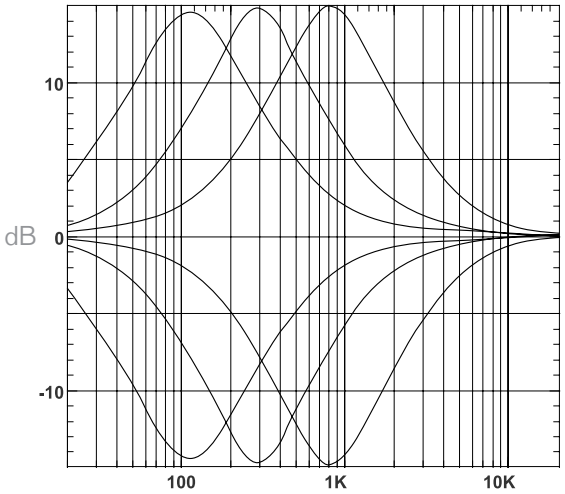
Bass/Treble



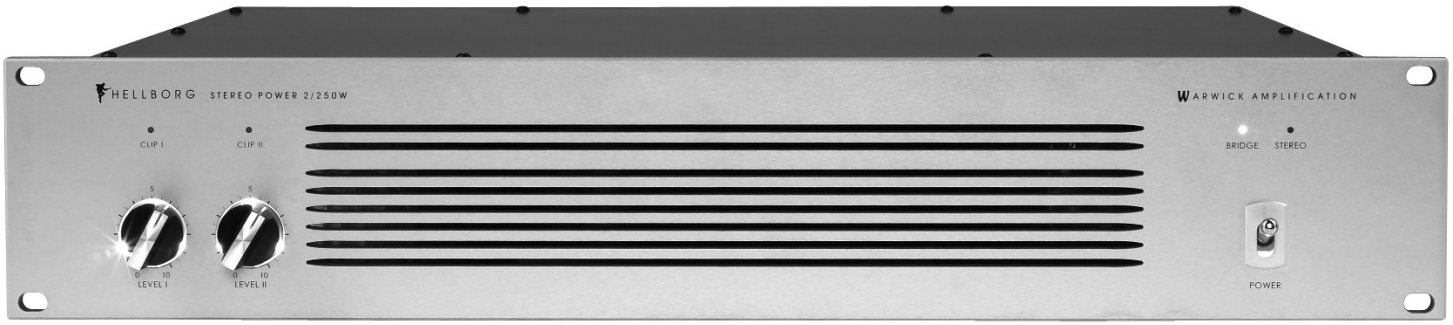
Lo-Mids



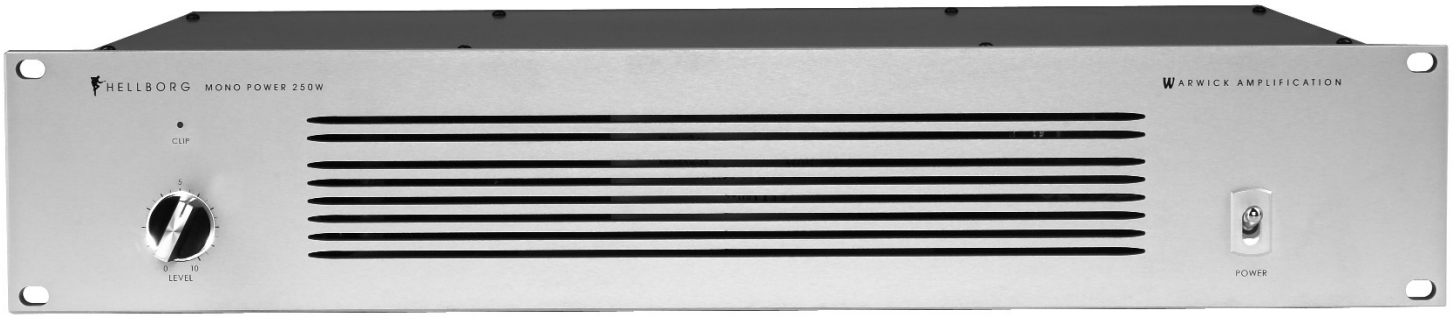
Hi-Mids



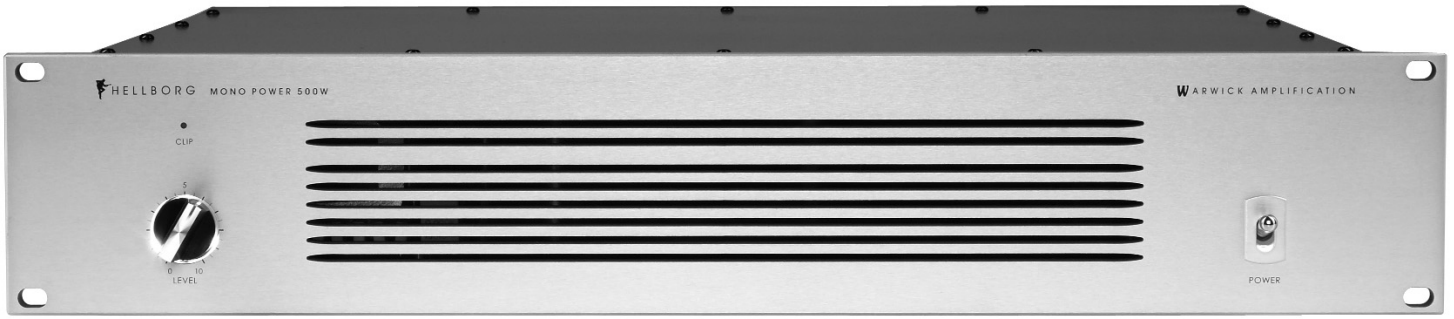
STEREO POWER AMP 2/250W



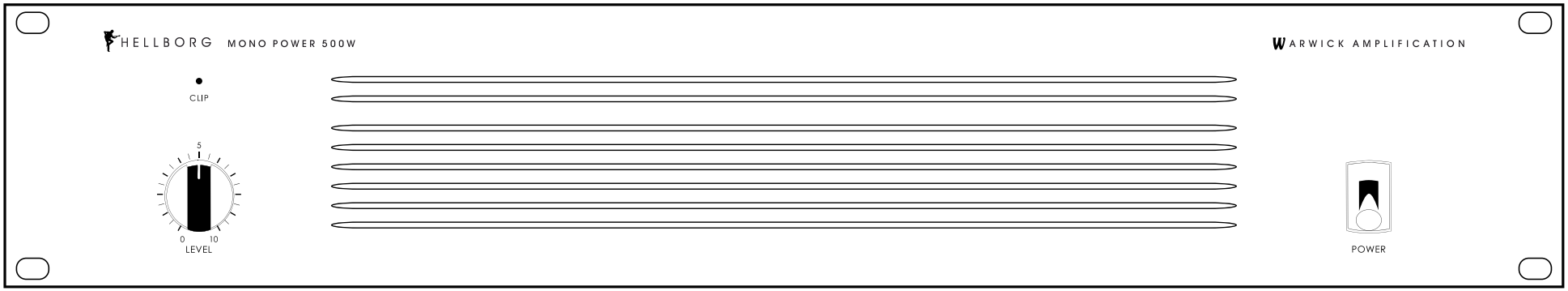
MONO POWER AMP 250W



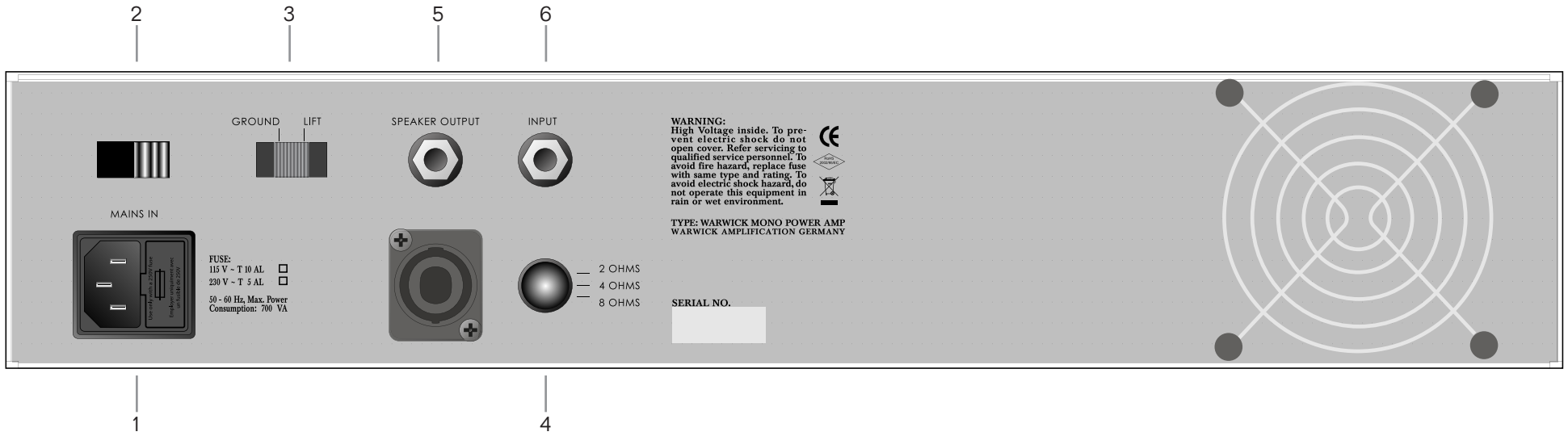
MONO POWER AMP 500W



The Hellborg Power Amps again are a mix of old and new ideas. They are characterized by their capacities to deliver fast transient attacks due to over dimensioned output stage and by the warm tube like sound resulting from the large speaker output transformers. In addition it has a range of computer controlled safety features to keep both amps and speakers healthy and happy.



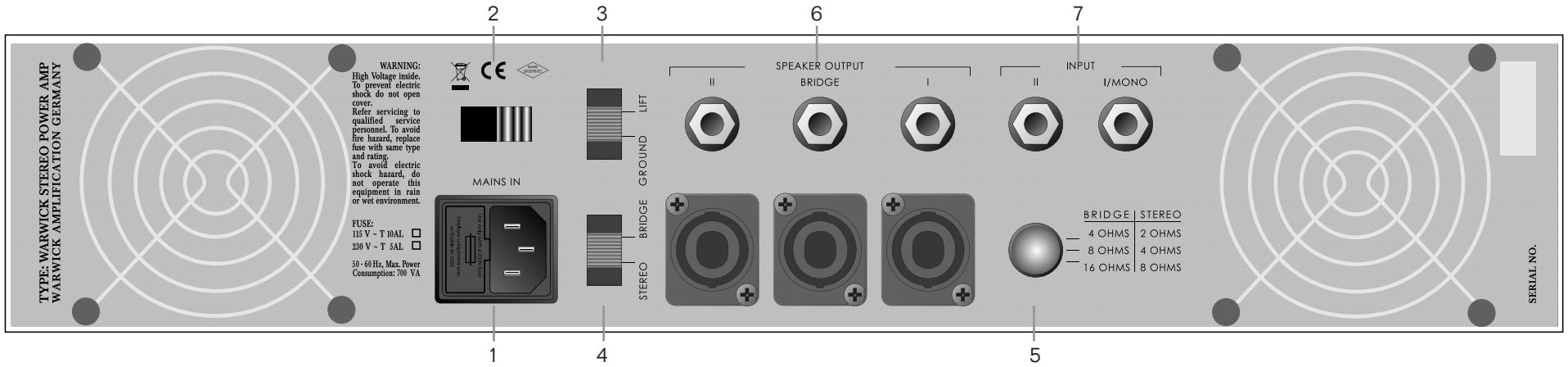
1. **Level Control** This adjusts the main volume of the amplifier. The CLIP LED above indicates when the input stage is being over-driven.
2. **Power (On/Off) Switch** This switch is to turn on the unit. The switch will be illuminated when the Power Amp is turned on.



1. **IEC Socket and Fuse Holder** This is the socket for plug in the line cord. The fuse tray contains the main fuse of the Power Amp. Replace the fuse only with the same type and size.
2. **Voltage Selector Switch** This switch is set at the factory to the correct voltage for your country. It can easily be changed to 230V or 115V by switching to the correct position FUSE values are T4AL for 230V and T8AL for 115V (T5AL/T10AL by the Mono Power 500W). Note when the wrong voltage value is set, there is a serious risk of damage to the unit if this is done incorrectly.
3. **Ground/Lift Switch** This switch is included to remove hum and buzz when connecting to equipment powered by a different ground system.
4. **Output Impedance Selector (2, 4 or 8Ω)** This adjusts the correct impedance depending on the impedance of the used speaker system. Before engaging the Power Amp be sure that the correct impedance is adjusted to obtain the maximum rated power. Never connect speaker cabinets with lower load as in the selected position is labelled on the amplifier. This will result in over heating of the amplifier and shutting down into protection mode.
5. **Speaker Output** The Mono Power Amplifier Series feature ¼" and lockable coaxial speaker sockets. To avoid damages connect speaker cabinets before main power is applied to the unit. When connecting speaker cabinets we recommend to use the lockable coaxial speaker socked preference to the ¼" jack as it provides a far superior connection. ¼" jacks have been added for a user-friendly handling when it is absolutely necessary to use them (for example by old cabinets without lockable speaker connection). Before turning on the amplifier make sure that the speakers are connected and the impedance switch is set to the correct position.
6. **Input** ¼" jack audio input for connecting instrument Preamp.

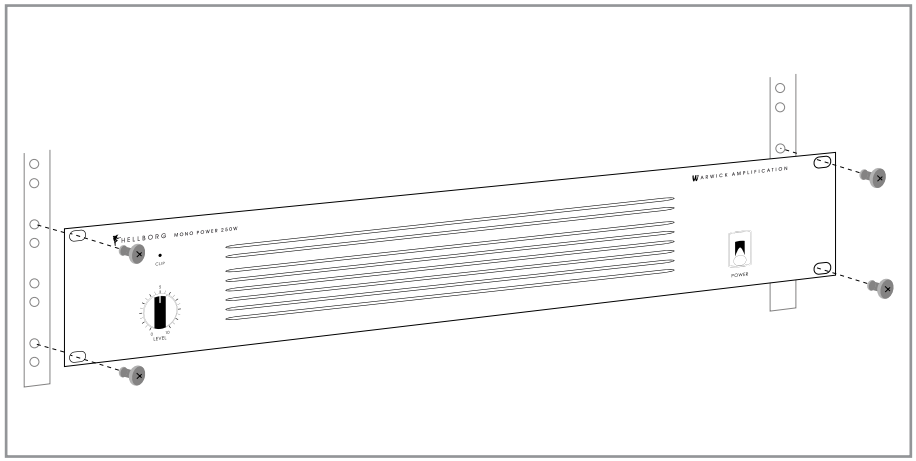


1. **Level Control I & II** This adjusts the main volume of each amplifier unit. The CLIP LED's above indicates when the inputstage is being over-driven.
2. **Mode Indication LED's** These LED's above the POWER switch indicates the consisting mode (Bridge/Stereo).
3. **Power (On/Off) Switch** This switch is to set on the unit. The switch will be illuminated when the power amplifier is engaged.

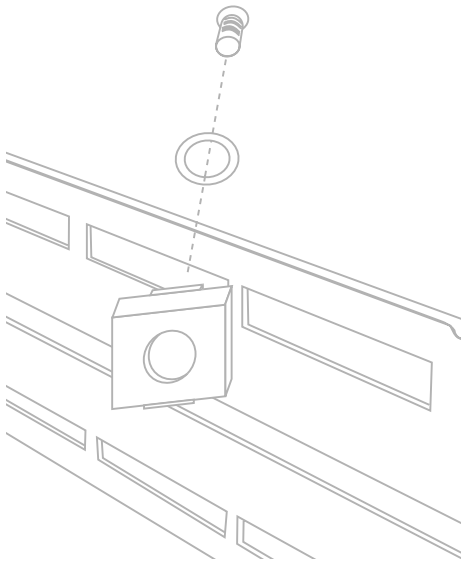


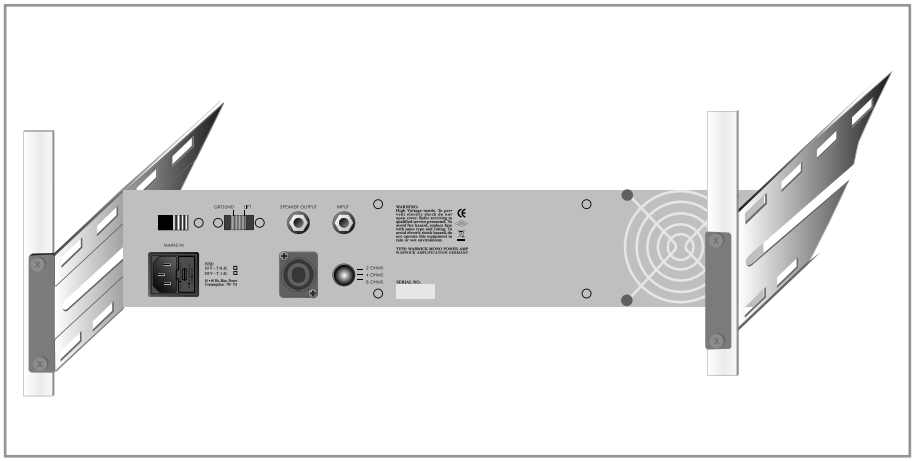
1. **IEC Socket and Fuse Holder** This is the socket for plug in the line cord. The fuse tray contains the main fuse of the Power Amp. Replace the fuse only with the same type and size.
2. **Voltage Selector Switch** (115V/230V) This switch is set at the factory to the correct voltage for your country. It can easily be changed to 230V or 115V by switching to the correct position. Fuse values are T5AL for 230V and T10AL for 115V. Note when the wrong voltage value is set, there is a serious risk of damage to the unit if this is done incorrectly.
3. **Ground/Lift Switch** This switch is included to remove hum and buzz when connecting to equipment powered by a different ground system.
4. **Stereo/Bridged Switch** This switch is to select Stereo or Bridged Mode (in bridge mode the amplifier works as a 500Wmono amp).
5. **Output Impedance Selector (2, 4 or 8Ω Stereo/4, 8 or 16Ω Bridged)** This adjusts the correct impedance depeding on the impedance of the used speaker system. Before engaging the Power Amplifier be sure that the correct impedance is adjusted to obtain the maximum rated power. Note the table for Stereo and Bridge setting. Never connect Speaker Cabinets with lower load as in the selected position is labelled on the amplifier. This will result in over heating of the amplifier and shutting down into protection mode.
6. **Speaker Output** The Stereo Power Amp features three ¼" and lockable coaxial speaker sockets for channel I, channel II and bridged mode (center socket). To avoid damages connect Speaker Cabinets before main power is applied to the unit. When connecting Speaker Cabinets we recommend to use the lockable coaxial speaker socked preference to the ¼" jack as it provides a far superior connection.
   ¼" jacks have been added for a user-friendly handling when it is absolutely necessary to use them (for example by old cabinets without lockable speaker connection). Before turning on the amplifier make sure that the speakers are connected and the impedance switch is set to the correct position.
7. **Input** The Stereo Power Amps features two ¼" audio input jacks for connecting the instrument Preamp. Input I is coupled with Input II when input II is not connected.

FRONT MOUNTING



REAR MOUNTING





The Hellborg Amplifiers are designed for installation in a conventional 19" rack case. 2 brackets for securing the Power Amplifier and 4 case nuts and screws are supplied.

PROTECTIVE CIRCUITS

The new Warwick Jonas Hellborg Power Amplifiers are equipped with a series of circuits to prevent it from destruction in case of inadequate operating conditions:

Power-up delay: When the unit is switched on, the SPEAKER OUT sockets are activated with a slight delay to protect the loudspeakers.

Short-Circuit: In the event of a short-circuit at the Power Amp outputs, this feature prevents the output stage transistors from destruction by quickly reducing current.

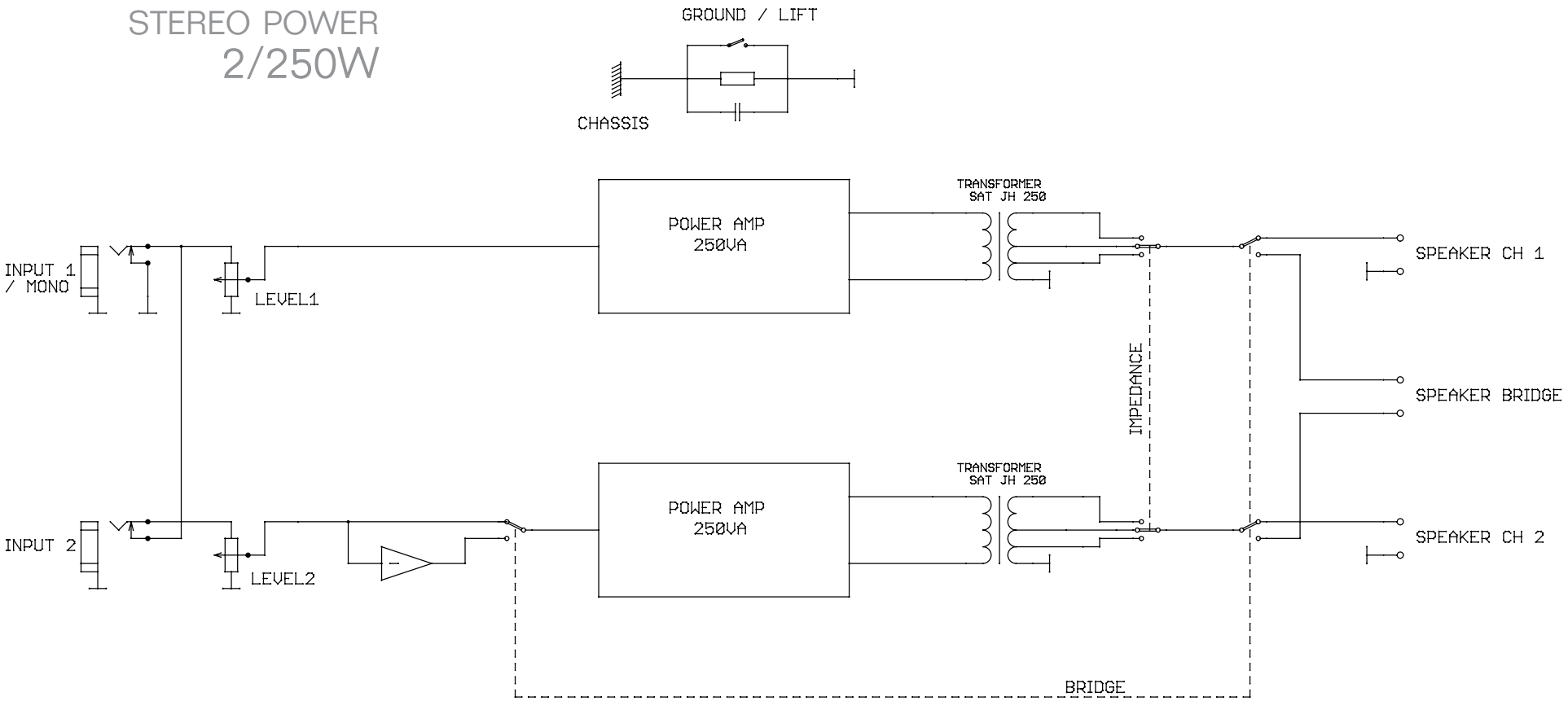
HF oscillation: By switching the Power Amp off, this safety feature prevents from damages that could be caused by frequencies in excess of 20kHz (feedback, etc.).

Excessive temperatures: Should the temperature-regulated fan cooler prove to be insufficient in extreme conditions, this circuit protects the output stage transistors from destruction by switching the device off.

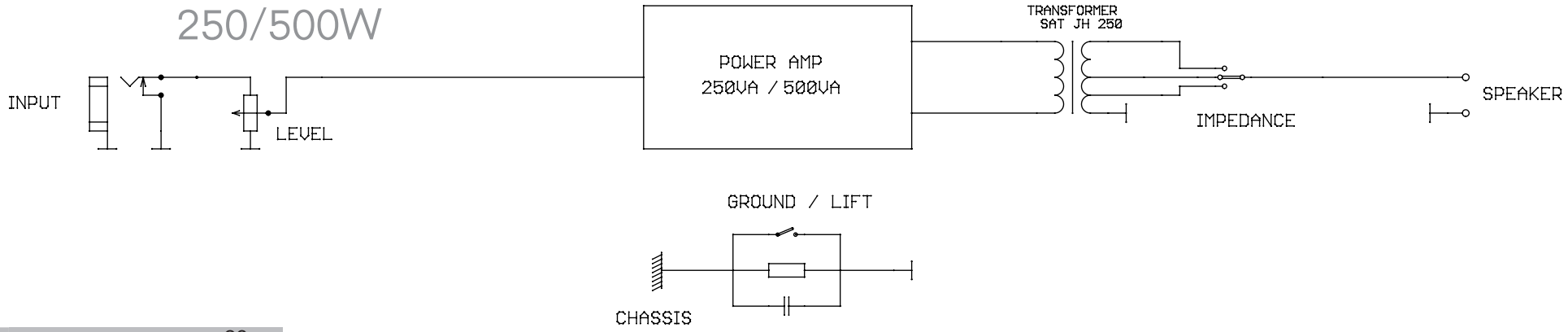
Note: The amplifier switches automatically back to playing mode as soon as it detects the fault has disappeared (e.g. the amplifier has overheated and cooled down again).

Specifications	Mono Power 250	Mono Power 500	Stereo Power 2/250
Input Sensitivity	0dBu	0dBu	0dBu
Input Impedance	5kΩ	5kΩ	5kΩ
Frequency Response	25Hz to 16kHz, -3dB	25Hz to 16kHz, -3dB	25Hz to 16kHz, -3dB
SNR	> 70dB	> 70dB	> 70dB
THD+N at 1kHz	< 0,1% below rated power	< 0,1% below rated power	< 0,1% below rated power
Output Power Rating	250W at 2/4/8Ω	500W at 2/4/8Ω	2x250W at 2/4/8Ω 1x500W at 4/8/16Ω (Bridged)
Auxiliary			
Mains Protection	T4AL (230V); T8AL (115V)	T5AL (230V); T10AL (115V)	T5AL (230V);T10AL (115V)
Dimensions (W/H/D)	19" / 1HE / 9,2" (233mm)	19" / 2HE / 15,6" (370mm)	19" / 2HE / 16,5" (420mm)
Weight	32lb(14,5kg)	42lb(19kg)	46,35lb(21kg)
Content	IEC supply cable, owners manual, 2x hexagon sockets, rear mounting brackets	IEC supply cable, owners manual, 2x hexagon sockets, rear mounting brackets	IEC supply cable, owners manual, 2x hexagon sockets, rear mounting brackets

STEREO POWER
2/250W



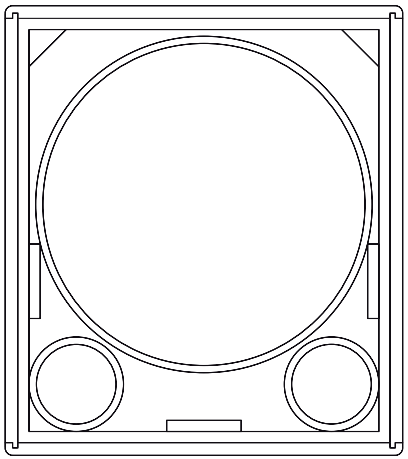
MONO POWER
250/500W



CABINETS

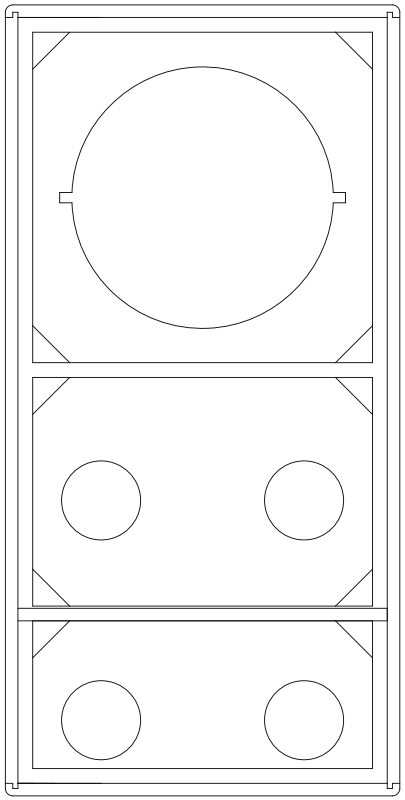


The philosophy behind the cabinets is to through correct cabinet design and use of specifically designed speaker drivers create clear full and loud sounding bass cabinets that projects over large spaces.



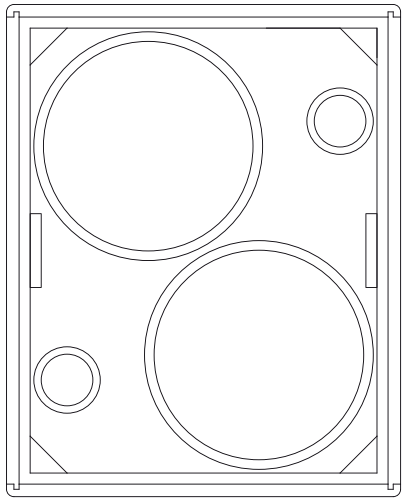
Club Cab

The Club Cab is designed to be portable, full range and loud enough to deal with any small venue or club setting. It basically is the top half of the Big Cab, with the same specially designed Celestion coaxial 15-inch speaker inside. It outperforms any 4x10 cabinet in the realms attack and clarity and still has a big, warm bottom end.



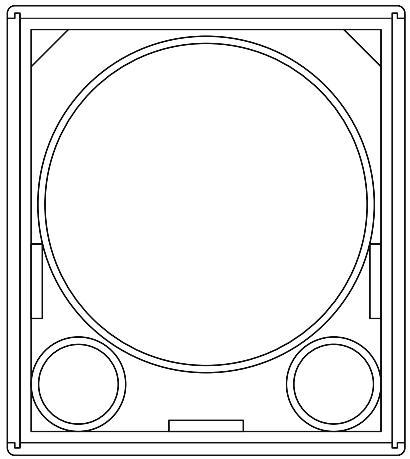
Big Cab

The Big Cab is a full range, high-performance speaker cabinet. It comes loaded with two Celestion 15-inch speakers. One coaxial 15-inch speaker was developed in cooperation with Celestion and is a powerful full range speaker that takes advantage of the phase linearity that coaxial technology (high frequency driver in the middle of the bass driver) gives. This is a hybrid bandpass cabinet an old trusted design that gives excellent low frequency response with the frontloaded coaxial a real Hi-Fi construction that will forever clear the bass fog and let you be heard.



Hi Cab

The Hi Cab was created to compete with loud guitars. It will give the clarity, presence and the full sound that you need competing with a noisy musical environment. The Hi Cab can be combined with the Big Cab or the Lo Cab to make an impressive bass stack. It is loaded with two Celestion 12-inch full range speakers.



Lo Cab

The Lo Cab is a low-end compliment to the Hi Cab and the Club Cab. The single Celestion 15-inch speaker is warm and punchy, adding a strong foundation to your bass tone.

TECHNICAL SPECIFICATIONS

Specifications	Big Cab	Club Cab	Hi Cab	Lo Cab
Type	2x15 direct radiating bandpass cabinet	1x15 bass reflex cabinet	2x12 bass reflex cabinet	1x15 bass reflex cabinet
Frequency Response	40Hz - 20kHz	50Hz - 20kHz	50Hz - 8kHz	40Hz - 3kHz
Power Rating	500W RMS	250W RMS	200W RMS	300W RMS
Impedance	4Ω	8Ω	4Ω	8Ω
Sensitivity	102dB SPL at 1w/1m	99dB SPL at 1w/1m	100dB SPL at 1w/1m	99dB SPL at 1w/1m
Speaker	1 x custom designed Celestion 15" coaxial speaker and 1 x 15" Celestion bass speaker	1 x custom designed Celestion 15" coaxial speaker	2 x Celestion 12" full range speakers	1 x 15" Celestion bass speaker
Dimensions (HxWxD)	42“x 21“x18“ 106,5 x 53,5 x 45,5cm	24“x 21“x 16“ 61 x 53,5 x 41,5cm	26.5“x 21“x 15“ 67 x 53,5 x 38cm	24“x 21“x 16“ 61 x 53,5 x 41,5cm
Weight	92.6lb (42kg)	48.5lb (22kg)	53lb (24kg)	48.5lb (22kg)

Cabinet Combinations	Club Cab & Lo Cab	Hi Cab & Big Cab	Hi Cab & Lo Cab	Big Cab	Club Cab
Pre & 250W	x				x
Pre & 500W	x			x	x
Pre & Stereo 2/250W	x			x	
Pre & 250W & 250W	x		x		
Pre & 250W & Stereo 2/250W		x			
Pre & 250W & 500W		x			

Club and Lo Cab

The Club and Lo Cab can be satisfactory powered by the 250W Mono, the 500W Mono, the 2x250W Stereo or two separate 250W Mono Amps. The first combination with the 250W Mono Amp is powerful enough for most applications if one however needs some extra kick the other combinations are recommended. The Stereo Amp offers the possibility to adjust the volume of each cabinet separately.

Big Cab

The Big Cab requires a powerful amplifier so either the 500W Mono or the 2x250W Stereo in bridged mode can be used.

Club Cab

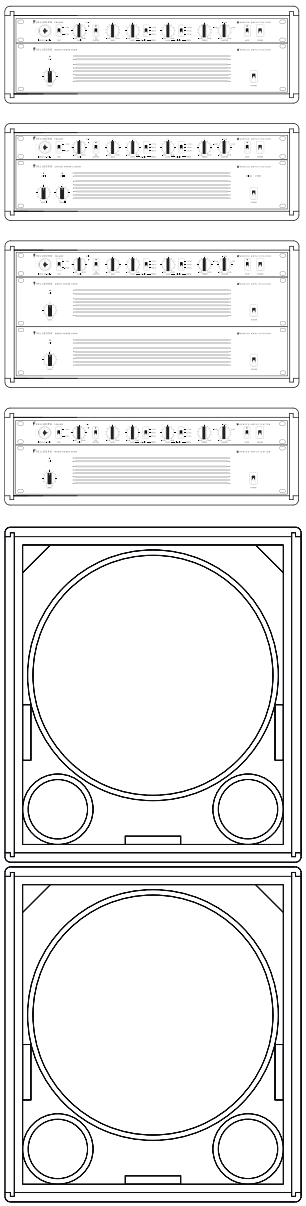
The Club Cab can be powered by either the 250W or 500W Mono Amps. The 250W Mono Amp will power the Club Cab adequately for smaller gigs. With the 500W Mono Amp gives you the possibility to expand your system to a powerful setup for bigger venues.

Hi and Big Cab

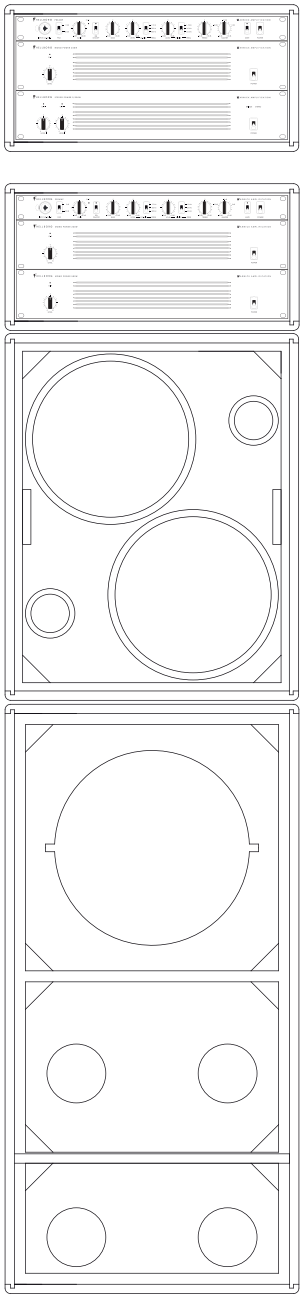
The Hi and Big Cab are ideally powered by the combination of a 250W Mono and a 500W Mono Amp.(the 500W could be replaced by a stereo unit in bridge mode). This setup is the loudest and most open sounding. It will not be drowned out in any sort of sonic mayhem.

Hi and Lo Cab

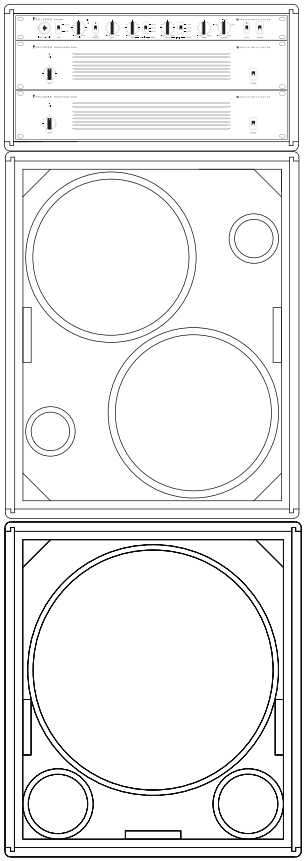
The Hi and Lo Cab requires two 250W Mono Amps. Because of the difference in impedance between the 2 cabinets you need separate amps so you can adjust the impedance correctly.



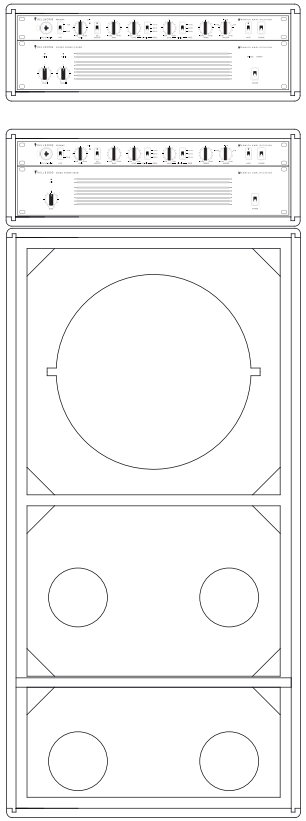
Club & Lo Cab



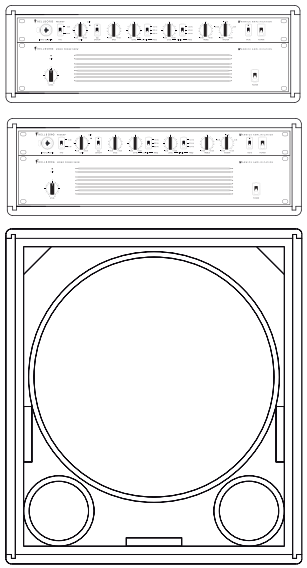
Hi & Big Cab



Hi & Lo Cab

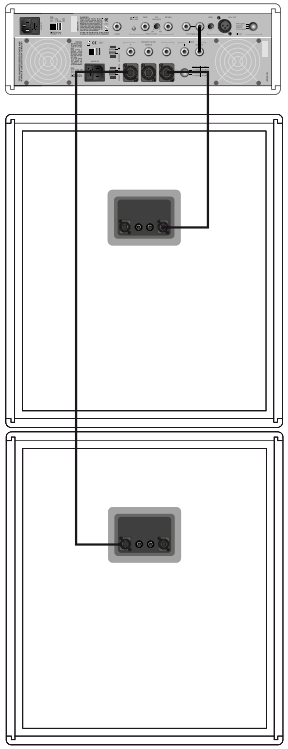


Big Cab



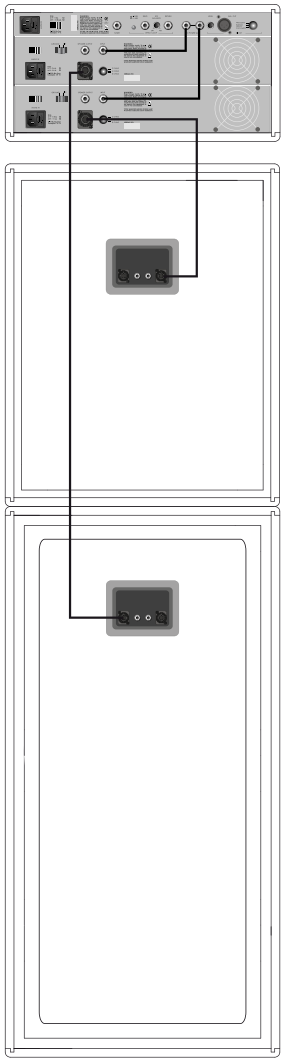
Club Cab

Preamp & Stereo 2/250W



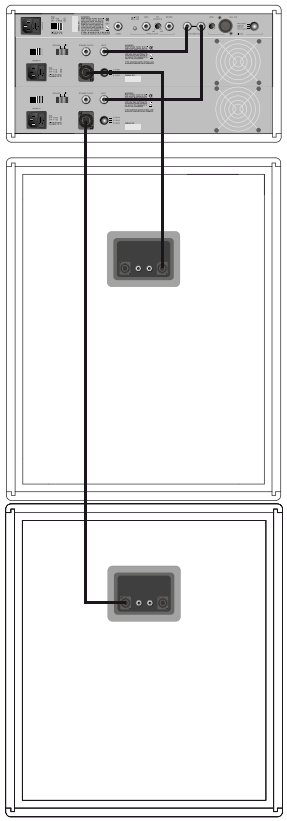
Club & Lo Cab

Preamp & 500W & 250W



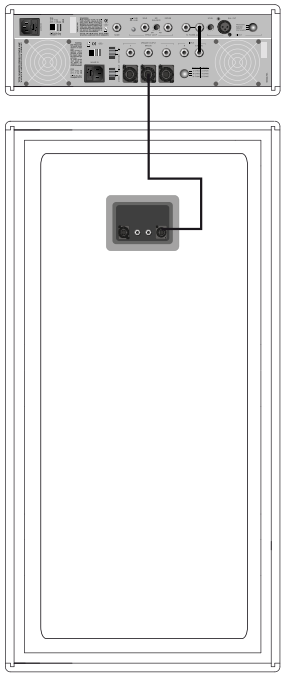
Hi & Big Cab

Preamp & 250W & 250W



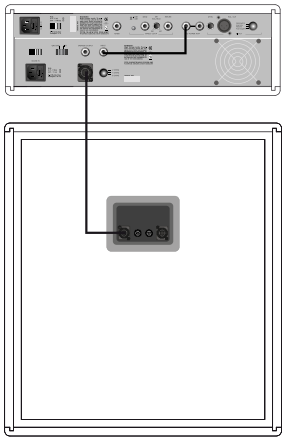
Hi & Lo Cab

Preamp & Stereo 2/250W



Big Cab

Preamp & 250W



Club Cab



Headquarters: Warwick GmbH&Co.Music Equipment KG • Gewerbepark 46 • 08258 Markneukirchen/Germany • E-Mail: info@warwick.de
Branch China: Warwick Music Equipment (Shanghai) Ltd., Co.• Shanghai Waigaoqiao Free Trade Zone • Shanghai 200131/P.R.China • E-Mail: info@warwick.cn
Branch UK: Warwick Music Equipment Trading (Manchester UK) Ltd. • 75 Bridge Street • Manchester M3 2RH / Great Britain • E-Mail: info@warwickbass.co.uk
Branch Switzerland: Warwick Music Equipment Trading (Zurich) GmbH • Kriesbachstrasse 30 • 8600 Dübendorf / Switzerland • E-Mail: info@warwick.ch
Branch CZ/SK: Warwick Music Equipment Trading (Praha CZ) s.r.o. • Spálená 23/93 • 11000 Praha 1 / Czech Republic • E-Mail: info@warwick.cz
Branch PL: Warwick Music Equipment Trading (Warsaw) Sp. z o.o. • Flory 7/18a • 00-586 Warsaw / Poland • E-Mail: info@warwick.pl

Visit us on the World Wide Web: http://www.warwick.de & join us in WARWICK BASS FORUM: www.warwick.de/forum

Warwick®

Basses,Amps&Rock'n Roll.