EUROLIVE PROFESSIONAL SERIES

ENGLISH

User's manual

Version 1.0 March 2005

B1220 PRO
B1520 PRO
B1800X PRO

www.behringer.com

BEHRINGER®
JUST LISTEN.

IMPORTANT SAFETY INSTRUCTIONS

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with dry cloth.

7) Before positioning your speakers, you must always make sure that the surface underneath them is completely firm. A surface that easily vibrates is not sufficiently safe for your speakers, therefore: as a general rule, only place your speakers onto even, firm ground surfaces.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Only use attachments/accessories specified by the manufacturer.

10) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tipping over.

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

12) Please make sure that no objects or liquids get into the unit's interior.

WARNING

THIS EQUIPMENT IS CAPABLE OF DELIVERING SOUND PRESSURE LEVELS IN EXCESS OF 90 dB, WHICH MAY CAUSE PERMANENT HEARING DAMAGE.

FOREWORD

Dear Customer,

welcome to the team of EUROLIVE users, and thank you very much for expressing your confidence in us by purchasing these PA loudspeakers.

Writing this foreword for you gives me great pleasure, because it represents the culmination of many months of hard work delivered by our engineering team to achieve a very ambitious goal: to develop an outstanding PA system that offers a maximum in flexibility and performance through its impressive sound character and outstanding features. The task of designing our new EUROLIVE PROFESSIONAL SERIES certainly meant a great deal of responsibility, which we assumed by focusing on you, the discerning user and musician. Meeting your expectations also meant a lot of work and night shifts. But it was fun, too. Developing a product usually brings a lot of people together, and what a great feeling it is when all who participated in such a project can be proud of what they've achieved.

It is our philosophy to share our enjoyment with you, because you are the most important member of the BEHRINGER team. With your highly competent suggestions for new products you've made a significant contribution to shaping our company and making it successful. In return, we guarantee you uncompromising quality as well as excellent technical and audio properties at an extremely reasonable price. All of this will enable you to give free rein to your creativity without being hampered by budget constraints.

We are often asked how we manage to produce such high-quality devices at such unbelievably low prices. The answer is quite simple: it's you, our customers! Many satisfied customers mean large sales volumes enabling us to get better purchasing terms for components, etc. Isn't it only fair to pass this benefit on to you? Because we know that your success is our success too!

I would like to thank all of you who have made the EUROLIVE PROFESSIONAL SERIES possible. You have all made your own personal contributions, from the developers to the many other employees at this company, and to you, the BEHRINGER user.

My friends, it's been worth the effort!

Thank you very much,

Uli Behringer

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WARNING!

☞ **These EUROLIVE PROFESSIONAL SERIES speakers are capable of producing extreme sound pressure levels. Please bear in mind that high sound pressure can not only tire your hearing, it can also cause permanent damage. Be sure to always select an appropriate volume level.**

2. OPTIMAL OPERATION

We have developed the EUROLIVE PROFESSIONAL SERIES for use in a wide range of possible applications. Of course, the sound of your loudspeakers depends on the acoustic characteristics of the room/space in which they are being used. The following chapters of this manual will give you information about getting the most out of your EUROLIVE speakers.

2.1 HF drivers

High frequencies are the segment of the audio spectrum responsible for clarity and speech intelligibility. These frequencies are the easiest ones to locate, but at the same time they are also the easiest ones to "obstruct." Therefore, we recommend positioning your speakers so that the HF drivers are located slightly above the height of the audience. This guarantees the best possible dispersion of high frequencies and a considerably higher intelligibility.

2.1.1 Directional pattern of asymmetrical HF drivers

An outstanding feature of the B1220 PRO and the B1520 PRO are their asymmetrically formed horns ("Asymmetrical Dispersion Constant Directivity Horn"). By turning the horns 90°, you can optimize the directional pattern for both vertical and horizontal speaker positioning. The default horn setting is the "front of house" vertical configuration, whereby the wide dispersion side (100°) is pointed downward and the narrow dispersion side (50°) is pointed upward. If you want to position your speaker horizontally (as a "floor" monitor), you can modify the horn position to assure optimal dispersion (turning the horn by 90°). Please do the following:

- ▲ Remove the speaker cover by carefully and uniformly pulling off the steel grill.
- ▲ Unfasten the four screws with which the horn is mounted.
- ▲ Turn the horn 90°, so that the wide dispersion side (100°) points upward when the loudspeaker is lying horizontally on its side.
- ▲ Mount the horn back into its place with the four previously unfastened screws.
- ▲ Set the grill back into its place and press gently until it snaps into position.

☞ **No warranty claim is valid for damage caused by incorrect handling or flawed and/or careless use.**

2.2 How to prevent feedback

Always place the "front of house" speakers ahead of the microphones (from the audience's perspective), and never behind. Use professional floor monitors (e.g. B1220 PRO or B1520 PRO) or an in-ear monitoring system to hear the stage performers.

2.3 How to avoid feedback when working with record players (DJ applications)

In applications with record players, bass feedback can occur. Bass feedback occurs when low frequencies get back to the pickup and are re-reproduced on the speakers. The most common causes for this are: speakers located too closely to the record player, a room with a wooden floor, or presence of a podium or a platform. In such cases, it is best to move the speakers away from the record player and "banish" them from the stage, so that they are located on firm ground. Another option is to use raised stands, which prevent the speakers from having a direct contact with the ground.

2.4 Loudspeaker protection by using a low-cut filter

Try to prevent damage to your speakers caused by extreme oscillation of the bass membrane due to subsonic noise and extremely deep frequencies. Use an equalizer to cut off those frequencies that fall below your speakers' frequency range, or use a low-cut/high-pass filter. Most equalizers and sound-improvement systems offer a low-cut function, like the BEHRINGER ULTRAGRAPH DIGITAL DEQ1024, for example.

Using a low-cut filter in your signal path is particularly recommended if you use record players or CD players as your signal source. CD players often produce extremely deep frequencies, which can lead to extreme excursions of the bass membrane.

3. OPERATING MODES

3.1 BI-AMPING and PASSIVE operation (B1800X PRO)

The EUROLIVE PROFESSIONAL SERIES subwoofer can run in two ways: in PASSIVE and BI-AMPING mode. The B1800X PRO can be switched from BI-AMPING to PASSIVE by using the switch located in the back. For all applications, your EUROLIVE speakers are connected using the speaker inputs.

☞ **Never switch the operating mode if your EUROLIVE speakers are wired to an active signal source.**

The subwoofer features an internal crossover. Running the B1800X PRO in passive mode makes it ideally suited for working together with the 2-way B1220 PRO and B1520 PRO systems. This way, you achieve an absolutely balanced sound characteristic. However, if you select the BI-AMPING mode, your subwoofer can be combined with other EUROLIVE 2-way systems. The BI-AMPING operating mode offers several primary advantages: lower distortion, greater flexibility of signal transmission as well as an improved overall performance of your system. The PASSIVE operating mode has the advantage of requiring no additional crossovers in order to keep the subwoofer's frequency range within its limits.

If you are using an external crossover, e.g. the BEHRINGER ULTRADRIVE PRO DCX2496, pay attention to chapter 8, "SPECIFICATIONS." There, you will find information about the recommended crossover frequency range. We recommend a slope rate of at least 12 dB, whereby a higher value guarantees the best possible performance. A slope rate of 24 dB is ideal.

Our recommendations are only examples of possible interactions between different EUROLIVE speakers. Depending on your own personal sound requirements and the genre of the music being played, other combinations are of course possible.

3.2 Looping through the subwoofer signal (B1800X PRO)

The B1800X PRO subwoofer from the EUROLIVE PROFESSIONAL SERIES features two speaker connectors. In BI-AMPING mode, the PINS 2-/2+ of the input are connected directly with the speaker. PINS 1-/1+ of the input are connected to the PINS 1-/1+ of the output and the signal can be simply looped through. To this end, please adhere to the specifications given in chapter 4.

☞ **Please keep in mind that when you switch the B1800X PRO subwoofer to BI-AMPING mode, the input signal is routed to PINS 2-/2+. In this case, PINS 1-/1+ merely serve to loop the signal through!**

3.3 PARALLEL Input (B1220 PRO and B1520 PRO)

The EUROLIVE B1220 PRO and B1520 PRO loudspeakers feature two speaker inputs laid out in parallel. You can alternatively connect one of the connectors to the output on your power amp and tap into the signal from the amp once again on the second connector, in order to, for example, feed this signal into an additional loudspeaker. This way, you can create stacks consisting of speakers with different impedance values.

☞ **ATTENTION: Never connect the output signals of different power amps to both parallel inputs at the same time. This may permanently damage your setup.**

4. PIN ASSIGNMENT (B1800X PRO)

	Subwoofer B1800X PRO	
	PINS 1-/1+	PINS 2-/2+
PASSIVE	INPUT: Full-range input OUTPUT: high-pass output	Signal loop
BI-AMPING	Signal loop	Subwoofer input

Table 4.1: Pin assignment

4.1 Subwoofer (PASSIVE)

▲ Feed the full-range signal to the input PINS 1-/1+. The high-pass signal can be tapped into at the output PINS 1-/1+. PINS 2-/2+ serve as a signal loop through.

4.2 Subwoofer (BI-AMPING)

▲ Connect the subwoofer signal to PINS 2-/2+.

▲ PINS 1-/1+ of the input are connected to PINS 1-/1+ of the output, and can be used to loop the signal through.

▲ In general, when in BI-AMPING mode, PINS 1-/1+ and PINS 2-/2+ are looped through.

5. ADDITIONAL CONSIDERATIONS

5.1 Length and diameter of loudspeaker cables

Loudspeaker cables whose diameter is too small can limit the power amp performance considerably. The longer the cable, the greater the problem. As a result, musicians often simply “turn up” the amp, which can lead to loudspeaker damage. Therefore, don’t use cables longer than 15 m (45 ft.). For most applications, this will not be necessary. Cable diameter should be at least 2.5 - 4.0 mm^2.

5.2 Power amp rating

Selecting the right amp can turn out to be rather difficult. Therefore, stick to the following rule of thumb: the power rating of your amp should be roughly twice the speaker load capacity. A speaker rated at 400 Watts continuous performance can easily be powered by an amp rated at 800 Watts output power. An optimal addition to your speaker system would be the BEHRINGER EUROPOWER EP2500 power amp, for example.

5.3 Fuses

We do not recommend the use of fuses with audio applications. Damage to loudspeakers can be the result of high peak signals and high output power. However, fuses can only offer protection from one of these two factors, and never from both. Additionally, fuse resistors are sometimes nonlinear, leading to distortion and unpredictable overdriving.

5.3.1 Protecting your equipment

▲ Always try to find the optimal signal level. Try to avoid overdriving your amp.

▲ Keep in mind the physical limitations of your PA system.

▲ Use a limiter to restrict the output signal level. Place the limiter between the mixing console and the power amp. For this purpose, our proven AUTOCOM PRO-XL MDX1600, COMPOSER PRO-XL MDX2600 and MULTICOM PRO-XL MDX4600 compressors offer an outstanding solution. All models can be used as a limiter: the audio signal doesn’t overdrive any more, and unpleasant “peaks” are effectively avoided.

☞ **Our ULTRADRIVE PRO DCX2496 and SUPER-X CX3400/ CX2310 crossovers are particularly well-suited for protecting your equipment: for each output, they have independent limiters.**

6. APPLICATION EXAMPLES

6.1 Full-range stereo operation

In the following example, the main stereo output signal of a mixing console is connected to a stereo power amplifier. A B1220 PRO is connected to each of the amp outputs, and these speakers reproduce the entire frequency range (full range).

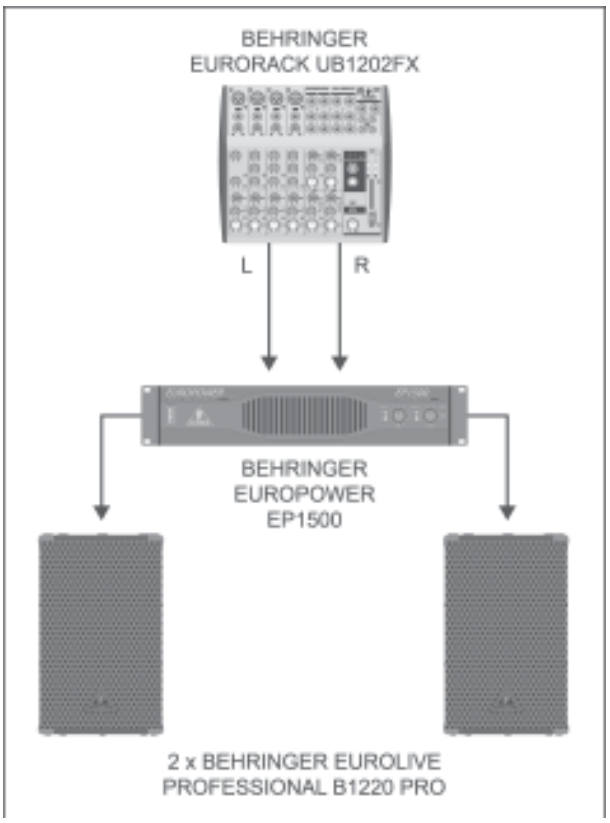

Fig. 6.1: Full-range stereo operation

6.2 Stereo operation with a subwoofer

Using a crossover, the main stereo output signal of a mixing console is split into a stereo signal and a mono signal, whereby the mono signal covers the lower frequency range and the stereo signal carries the rest of the frequencies. Then, the stereo signal is connected to a stereo power amplifier. A B1520 PRO is connected to each of the amp's outputs. The mono subwoofer signal is connected to one channel of an additional power amplifier, which is powering one B1800X PRO subwoofer.

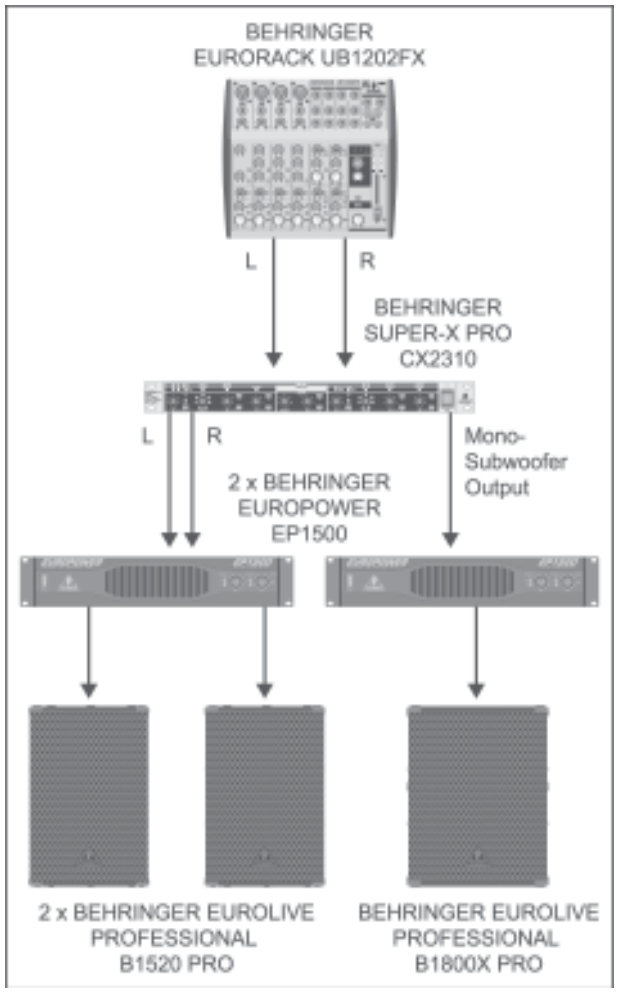

Fig. 6.2: Stereo operation with a subwoofer

6.3 Stereo operation with a parallel stage monitoring system and a subwoofer

This example shows the use of two B1520 PROs as FOH loudspeakers and one B1220 PRO used as a floor monitor on stage. The FOH loudspeakers reproduce the main stereo output signal from the mixing console, while the stage monitor is fed an independent monitor mix through a mono monitor send (Aux Send). A separate subwoofer output feeds a B1800X PRO subwoofer with the bass signal. Two stereo power amps are required for this application, whereby one amp reproduces the main stereo signal, and the other one reproduces both mono signals (subwoofer and monitor signal).

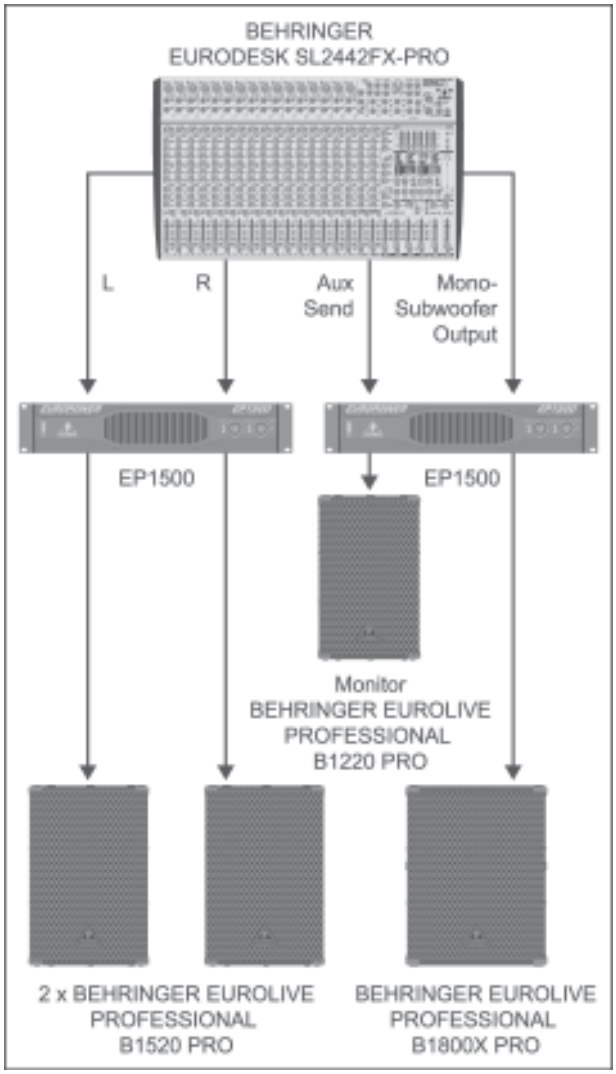

Fig. 6.3: Stereo operation with a parallel stage monitoring system and subwoofer

7. TROUBLESHOOTING

7.1 No signal when loudspeaker is connected

- Make sure that your mixing console is indeed carrying a signal (is the master fader raised? Are channels active?) and that the gain control on your amp is turned up.
- When using a crossover, make sure that the relevant channels are active.
- Check if the cable connection is interrupted/damaged somewhere in your setup.
- To test your configuration, connect another amp. If you now get a signal, the power amp is the culprit.
- To test your configuration, connect another speaker. If you now get a signal, the fault lies within the speaker.

7.2 Signal present only on one channel

- Make sure that your mixing console is working properly (is the signal present on both outputs (L/R)?).
- If using a crossover, check if the relevant channel is active.
- Check if the cable connection to the silent channel and to the corresponding speakers is interrupted/damaged somewhere along the path.
- Connect the silent loudspeaker onto the amp channel that works properly. If you now get a signal, it is the amp channel that is at fault. If you still can not hear anything, the fault lies either within the loudspeaker or the cables used.

7.3 Signal distorted

- Make sure that all signals on the mixing console have been set to optimal levels in order to avoid distortion.
- If using a crossover, check if all signals have been set to correct levels.
- Make sure that the power amp channels are not overdriving. If so, turn the gain control down a little. However, it could also be the case that your power amp doesn't have enough power headroom, so that the required volume can not be generated without starting to distort.
- Make sure that the level of the signal getting into the speakers is not too high, causing distortion.
- Check your EQ settings. Excessively increasing the frequencies can result in distortion.
- If distortion is still occurring despite everything you have tried to eliminate it, try connecting a different power amp. If you no longer hear distortion, its cause was with the power amp.
- As a test, connect another speaker. If you no longer hear distortion, its cause was with the loudspeaker (perhaps a defective loudspeaker).
- Check if the cable connection is interrupted/defective somewhere along the path.

7.4 Treble signal too low

- Check the EQ settings on your mixing console or on an external EQ, if applicable.
- Make sure that the tweeters on your loudspeakers are positioned at the same height as the ears of the people in the audience. If not, please modify the speaker position.
- The internal tweeter fuse may have opened. In this case, please contact a BEHRINGER service branch office near you.

7.5 Bass signal too low

- ▲ Check the EQ settings on your mixing console or on an external EQ, if applicable.
- ▲ Check the speaker cable pin assignment (see fig. 1.3). Incorrect pin assignment can cause phase cancellation and the frequency incursions related to it.

7.6 Poor sound characteristics

- ▲ Check the speaker cable pin assignment (see fig. 1.3). Incorrect pin assignment can cause phase cancellation and the frequency incursions related to it.
- ▲ Check if large objects (e.g. effect racks and similar equipment) are placed in front of the loudspeakers. They too can negatively influence sound dispersion.
- ▲ Check the sound quality of the input signal by listening to it on a set of headphones.
- ▲ Also see the instructions in the chapters 7.3, 7.4 and 7.5.

8. SPECIFICATIONS

SYSTEM DATA	B1220 PRO	B1520 PRO	B1800X PRO
Type	2-way full-range speaker (12" + 1")	2-way full-range speaker (15" + 1")	Subwoofer (18")
Frequency response	55 Hz - 18 kHz (-10 dB)	50 Hz - 18 kHz (-10 dB)	40 Hz - 300 Hz (-10 dB)
Power rating[1] (RMS)	400 W	400 W	800 W
Power rating (Peak Program)	800 W	800 W	1600 W
Impedance	8 Ω	8 Ω	8 Ω
Sound pressure level[2] (1 W @ 1 m)	95 dB (Full Space)	96 dB (Full Space)	100 dB (Half Space)
Dispersion	100° (50°) x 50°	100° (50°) x 50°	-
Crossover frequency	2.5 kHz	1.8 kHz	-

COMPONENTS			
HF driver	25T20A8	25T20A8	-
Woofer	12W400A8	15W400A8	18SW800A8

DIMENSIONS/WEIGHT			
(W x H x D)	ca. 15 3/5" x 25 1/8" x 16" (397 mm x 638 mm x 406 mm)	ca. 18 3/10" x 27 3/5" x 19" (465 mm x 700 mm x 482 mm)	ca. 21 1/2" x 27 3/5" x 21 3/4" (547 mm x 700 mm x 553 mm)
Weight	approx. 52 1/10 lbs (24 kg)	approx. 59 1/2 lbs (27 kg)	approx. 77 1/5 (35 kg)

BI AMP OPERATION			
Recommended crossover frequency (external crossover network)[3]	-	-	175 Hz
Power rating/impedance woofer	400 W IEC/8 Ω	400 W IEC/8 Ω	800 W IEC/8 Ω
Power rating/impedance HF driver	60 W IEC/8 Ω (>2.5 kHz/12 dB/oct)	60 W IEC/8 Ω (>2.5 kHz/12 dB/oct)	-

[1] Average value over bandwidth of 50 Hz - 5 kHz (multi-way systems) and 40 Hz - 250 Hz (subwoofer) according to IEC 268-5.

[2] Average value over bandwidth 100 Hz - 2 kHz (multi-way systems) und 100 Hz - 250 Hz (subwoofer) according to IEC 268-5.

[3] Slope: 12 - 24 dB

9. WARRANTY

§ 1 OTHER WARRANTY RIGHTS AND NATIONAL LAW

1. This warranty does not exclude or limit the buyer's statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract.

2. The warranty regulations mentioned herein are applicable unless they constitute an infringement of national warranty law.

§ 2 ONLINE REGISTRATION

Please do remember to register your new BEHRINGER equipment right after your purchase by visiting www.behringer.com (alternatively www.behringer.de) and kindly read the terms and conditions of our warranty carefully.

Registering your purchase and equipment with us helps us process your repair claims quicker and more efficiently.

Thank you for your cooperation!

§ 3 WARRANTY

1. BEHRINGER (BEHRINGER International GmbH including all BEHRINGER subsidiaries listed on the enclosed page, except BEHRINGER Japan) warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year* from the original date of purchase, in accordance with the warranty regulations described below. If the product shows any defects within the specified warranty period that are not excluded from this warranty as described under § 5, BEHRINGER shall, at its discretion, either replace or repair the product using suitable new or reconditioned parts. In the case that other parts are used which constitute an improvement, BEHRINGER may, at its discretion, charge the customer for the additional cost of these parts.

2. If the warranty claim proves to be justified, the product will be returned to the user freight prepaid.

3. Warranty claims other than those indicated above are expressly excluded.

§ 4 RETURN AUTHORIZATION NUMBER

1. To obtain warranty service, the buyer (or his authorized dealer) must call BEHRINGER (see enclosed list) during normal business hours **BEFORE** returning the product. All inquiries must be accompanied by a description of the problem. BEHRINGER will then issue a return authorization number.

2. Subsequently, the product must be returned in its original shipping carton, together with the return authorization number to the address indicated by BEHRINGER.

3. Shipments without freight prepaid will not be accepted.

§ 5 WARRANTY REGULATIONS

1. Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice. Any product deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced.

2. If the product needs to be modified or adapted in order to comply with applicable technical or safety standards on a national or local level, in any country which is not the country for which the product was originally developed and manufactured, this modification/adaptation shall not be considered a defect in materials or workmanship. The warranty does not cover any such modification/adaptation, irrespective of whether it was carried out properly or not. Under the terms of this warranty, BEHRINGER shall not be held responsible for any cost resulting from such a modification/adaptation.

3. Free inspections and maintenance/repair work are expressly excluded from this warranty, in particular, if caused by improper handling of the product by the user. This also applies to defects caused by normal wear and tear, in particular, of faders, crossfaders, potentiometers, keys/buttons, tubes, guitar strings, illuminants and similar parts.

4. Damages/defects caused by the following conditions are not covered by this warranty:

- ▲ improper handling, neglect or failure to operate the unit in compliance with the instructions given in BEHRINGER user or service manuals.
- ▲ connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used.
- ▲ damages/defects caused by force majeure or any other condition that is beyond the control of BEHRINGER.

5. Any repair or opening of the unit carried out by unauthorized personnel (user included) will void the warranty.

6. If an inspection of the product by BEHRINGER shows that the defect in question is not covered by the warranty, the inspection costs are payable by the customer.

7. Products which do not meet the terms of this warranty will be repaired exclusively at the buyer's expense. BEHRINGER will inform the buyer of any such circumstance. If the buyer fails to submit a written repair order within 6 weeks after notification, BEHRINGER will return the unit C.O.D. with a separate invoice for freight and packing. Such costs will also be invoiced separately when the buyer has sent in a written repair order.

§ 6 WARRANTY TRANSFERABILITY

This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of BEHRINGER.

§ 7 CLAIM FOR DAMAGES

Failure of BEHRINGER to provide proper warranty service shall not entitle the buyer to claim (consequential) damages. In no event shall the liability of BEHRINGER exceed the invoiced value of the product.

* Customers in the European Union please contact BEHRINGER Germany Support for further details.