

EUROLIVE PERFORMER SERIES

User's manual

Version 1.0 March 2005

ENGLISH

E1220
E1520
E1800X

www.behringer.com



EUROLIVE PERFORMER SERIES

IMPORTANT SAFETY INSTRUCTIONS

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this device near water.
- 6) Clean only with a dry cloth.
- 7) Be sure to mount your speakers on a solid, stable and level base or stand. Vibrating floors do not provide reliable support for speaker enclosures or stacks.
- 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 device. When a cart is used, use caution when moving the cart/device combination to avoid injury from stumbling over it.



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

12) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

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 PERFORMER 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 PERFORMER 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 PERFORMER 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.

EUROLIVE PERFORMER SERIES

1. INTRODUCTION

By purchasing BEHRINGER EUROLIVE PERFORMER speakers, you have obtained a first-class PA loudspeaker system. Now, you own (at least) one component of an expandable system that will reproduce the sound of your musical material unadulterated and perfectly balanced.


Thanks to its numerous features, the EUROLIVE PERFORMER SERIES is the ideal PA loudspeaker system: it is equally well-suited both for small gigs and large stages. We have brought it to life in order to offer you a complete range of loudspeaker choices. In doing so, we have left open all the options for expanding your PA system. All loudspeakers feature professional inputs and outputs (compatible to Neutrik® Speakon®), letting you flexibly expand your setup whenever you need to.


 The following instructions are intended to familiarize you with the specialized terminology used throughout this user's manual, so that you can master all the functions. After having thoroughly read the user's manual, store it in a safe place for future reference.


1.1 Before you get started


1.1.1 Shipment

Your EUROLIVE speakers were carefully packed at the assembly plant to assure secure transport. Should the condition of the cardboard box suggest that damage may have taken place, please inspect the unit immediately and look for physical indications of damage.

 Damaged units should NEVER be sent directly to us. Please inform the dealer from whom you acquired the unit immediately as well as the transportation company from which you took delivery of the unit. Otherwise, all claims for replacement/repair may be rendered invalid.


 Please always use the original packaging to avoid damage due to storage or shipping.

 Never let unsupervised children play with the EUROLIVE speakers or their packaging.

 Please dispose of all packaging materials in an environmentally friendly fashion.

1.1.2 Initial operation

Your EUROLIVE speakers are connected to a power amplifier using the speaker connectors located in the back. Please read ch. 5, "ADDITIONAL CONSIDERATIONS" and ch. 6, "APPLICATION EXAMPLES" to get important technical information and practical suggestions about use.

 Always make sure to mute your power amplifier before connecting the speakers.

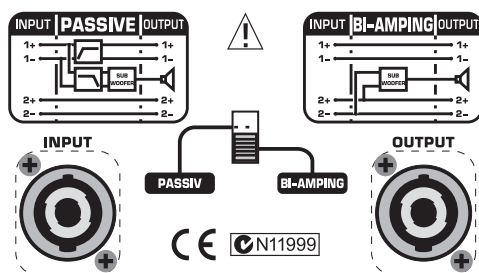


Fig. 1.1: Subwoofer connector panel (E1800X)

The EUROLIVE PERFORMER SERIES features professional speaker connectors (compatible to Neutrik® Speakon®) that assure problem-free operation. The Speakon® connector was developed for loudspeakers with high power ratings. If it is connected into the corresponding plug, it locks into place and cannot accidentally be disconnected. It protects against electric shock and assures correct polarity. Each of the plugs only carries the assigned individual signal (see table 4.1/Fig. 1.2 and the insignia on the back of the unit).

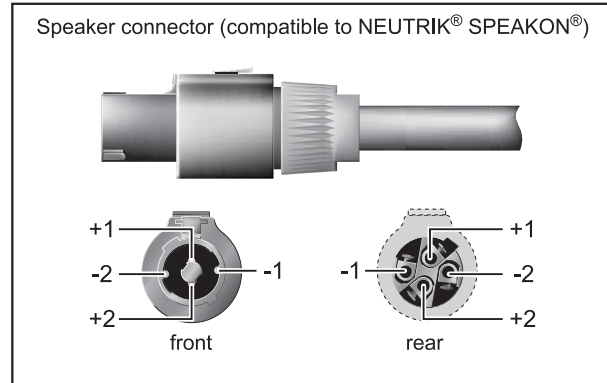


Fig. 1.2: Connector compatible to Neutrik® Speakon®

Please only use the commercially available Speakon® cables (type NL4FC) to connect your loudspeakers to the power amp. Verify the pin assignment of your loudspeakers and cables depending on the loudspeaker output you are using.

1.1.3 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.

Should your BEHRINGER product malfunction, our goal is to have it repaired as quickly as possible. To arrange for warranty service, please contact the retailer from whom the equipment was purchased. Should your BEHRINGER dealer not be located in your vicinity, you may directly contact one of our subsidiaries. Corresponding contact information is included in the original equipment packaging (Global Contact Information/European Contact Information). Should your country not be listed, please contact the distributor nearest you. A list of distributors can be found in the support area of our website (www.behringer.com/support).

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

Thank you for your cooperation!

1.2 User's manual

This user's manual is structured in such a way to give you an overview about the application options of your EUROLIVE PERFORMER speakers, giving you at the same time important information about optimizing your PA system. Should you require detailed explanations about specific subjects, please visit us on the internet at www.behringer.com.

2. OPTIMAL OPERATION

We have developed the EUROLIVE PERFORMER 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 considerably higher intelligibility.

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. E1220 or E1520) 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. SUBWOOFER OPERATING MODES

3.1 BI-AMPING and PASSIVE operation (E1800X)

The EUROLIVE PERFORMER SERIES subwoofer can run in two ways: in PASSIVE and BI-AMPING mode. The E1800X 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 E1800X in passive mode makes it ideally suited for working together with the 2-way E1220 and W1520 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 (E1800X)

The E1800X subwoofer from the EUROLIVE PERFORMER 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 E1800X 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!**

EUROLIVE PERFORMER SERIES

4. PIN ASSIGNMENT

Subwoofer E1800X		
	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 considerably limit the power amp performance. The longer the cable, the more pronounced 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 mm².

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 200 Watts continuous performance can easily be powered by an amp rated at 400 Watts output power. An optimal addition to your speaker system would be the BEHRINGER EUROPOWER EP1500 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 E1220 PRO is connected to each of the amp outputs, and these speakers reproduce the entire frequency range (full range).

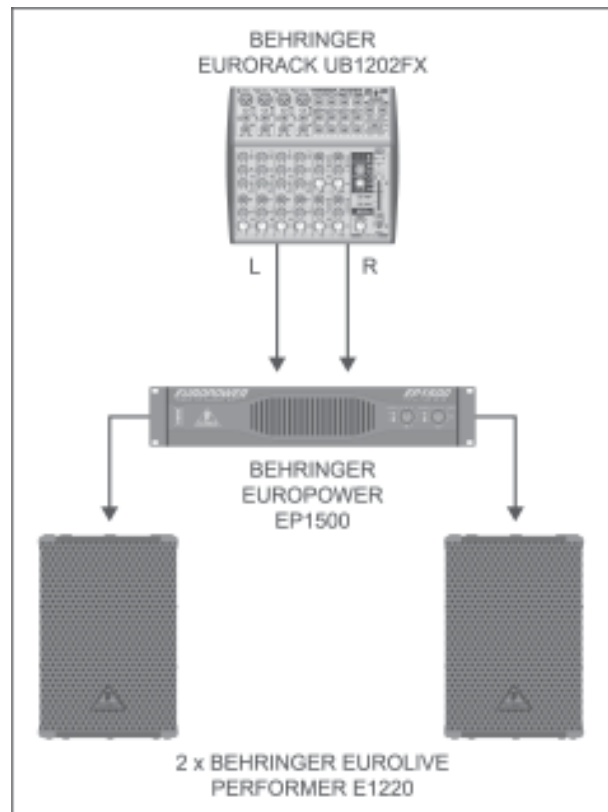


Fig. 6.1: Full-range stereo operation

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. An E1520 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 E1800X subwoofer.

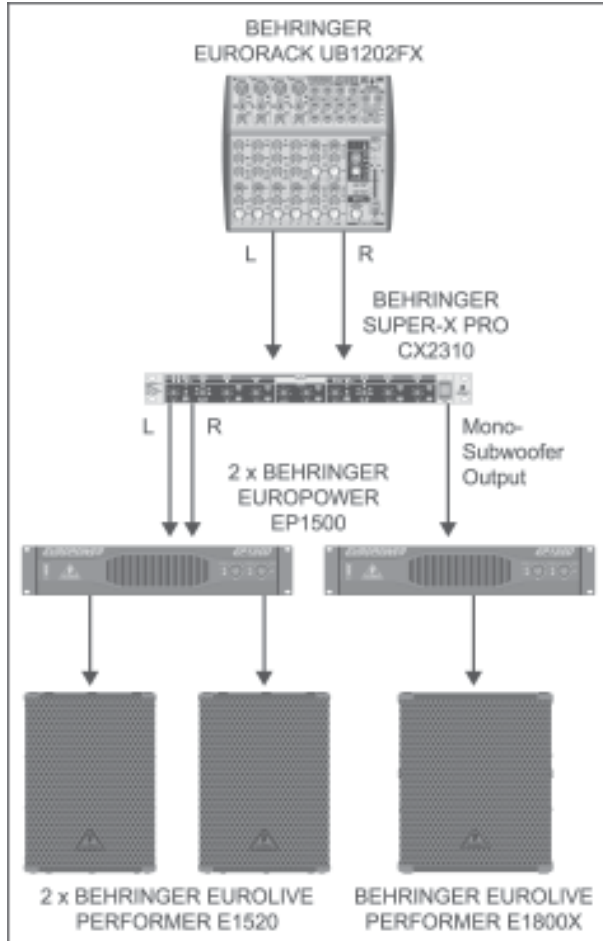


Fig. 6.2: Stereo operation with a subwoofer

6.3 Stereo operation with a stage monitor and a subwoofer

This example shows the use of two E1520s as FOH loudspeakers and one E1220 used as a floor monitor on the 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 an E1800X 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).

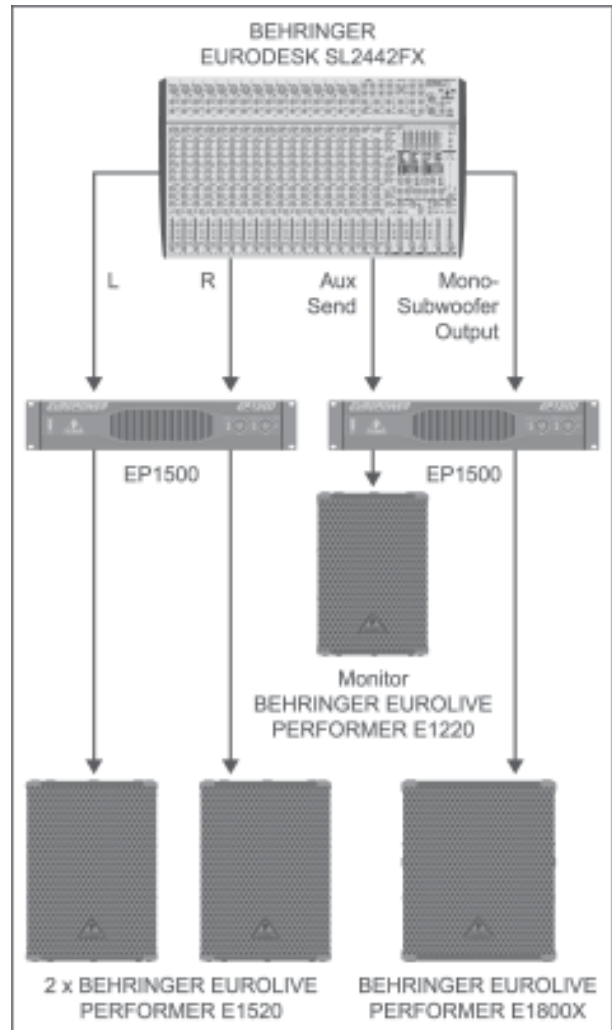


Fig. 6.3: Stereo operation with a stage monitor and a subwoofer

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.

EUROLIVE PERFORMER SERIES

8. SPECIFICATIONS

SYSTEM DATA	E1220	E1520	E1800X
Type	2-way full-range speaker (12" + 1")	2-way full-range speaker (15" + 1")	Subwoofer (18")
Frequency response	60 Hz - 20 kHz (-10 dB)	55 Hz - 20 kHz (-10 dB)	45 Hz - 300 Hz (-10 dB)
Power rating ¹ (RMS)	200 W	200 W	400 W
Power rating (Peak Program)	400 W	400 W	800 W
Impedance	8 Ω	8 Ω	8 Ω
Sound pressure level ² (1 W @ 1 m)	93 dB (Full Space)	94 dB (Full Space)	99 dB (Half Space)
Dispersion	90° x 40°	90° x 40°	-
Crossover frequency	3 kHz	2.8 kHz	-

COMPONENTS			
HF driver	29Z30B8	29Z30B8	-
Woofer	12W200C8	15W200D8	18SW400C8

DIMENSIONS/WEIGHT			
(W x H x D)	approx. 15 5/8" x 22 4/5" x 16" (397 mm x 580 mm x 406 mm)	approx. 18 3/10" x 25 1/5" x 19" (465 mm x 640 mm x 482 mm)	approx. 21 1/2" x 25 1/5" x 21 4/5" (547 mm x 640 mm x 553 mm)
Weight	approx. 44 lbs (20 kg)	approx. 48.5 lbs (22 kg)	approx. 66 lbs (30 kg)

BI AMP OPERATION			
Recommended crossover frequency (external crossover network) ³	-	-	175 Hz
Power rating/impedance woofer	200 W IEC/8 Ω	200 W IEC/8 Ω	400 W IEC/8 Ω
Power rating/impedance HF driver	30 W IEC/8 Ω (>2.5 kHz/12 dB/Oct.)	30 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.

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