Operating Instructions

for the

“Q” Range

Sub-Bass Systems

FULLY AC3 COMPATIBLE

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WELCOME

Thank you for buying a REL “Q” range Sub-Bass system. Our “Q” range are carefully hand built using the finest materials available and are designed for maximum performance. This manual contains important safety information as well as helpful advice and should be carefully studied before connecting up.

WORLD WIDE WARRANTY

In addition to any local Warranty, REL offer a 3-year conditional Worldwide Warranty to the end user. It is done in collaboration with our Distributors.

The conditions of this Warranty are:

1. That REL receive the necessary registration details from the end user.
2. That these details are received within six weeks of purchase.
3. That the product is not exported from the country of purchase for at least eight weeks after purchase.
4. That any claim is accompanied by the necessary proof of purchase.
5. That it shall be for a term of 3 years from the date of purchase.
6. That the product has not been abused or modified in any way.
7. That it was purchased originally from a REL authorised dealer.

This Warranty is offered in good faith and is in addition to any statuary rights or existing Warranty that may be available to the end user.

Should your REL subwoofer give you a problem, please contact your dealer who will be able to make whatever arrangements are necessary to correct it.

SERVICE AFTER WARRANTY

Please contact your dealer in the first instance before returning any product direct to us. Should the unit need to be returned for any reason, all carriage costs will be payable by the customer. Losses or damage caused during transit are the customer's risk.

WARNING

This item is heavy! To avoid risk of injury, take care when handling

INTRODUCTION

SUB-BASS SYSTEM

Many or most loudspeakers designed to reproduce low bass are specifically designed to emphasize the mid bass. This is the range from 30 to 70 Hertz. We at REL believe this is wrong. All of our designs are true sub bass systems, meaning they are designed to reproduce those very low frequencies that are felt rather than heard. This is because we believe that music is full range, as are sound effects on movies, and we intend our products to reproduce all of these sounds, not a narrow band.

The “Q” range models are equipped to allow you to take full advantage of AC3, Dolby Digital, DTS, MPEG 2 and any other digital sound format that includes a dedicated Low Frequency Effects (LFE) channel.

The dedicated LFE input meets the tough specification laid down for digital 3/2.1 channels, usually known as 5.1. The output is nominally flat from 25Hz - 120hz. It has a dedicated input level control which enables users to set the LFE level independently of the processor. This is important because not all processors offer control over this significant parameter. The LFE channel is typically recorded at 10db higher levels than the other channels.

The “Q” range also has standard speaker level inputs with their own input level control. Uniquely, both the speaker level and the LFE input can be used simultaneously. This means you can set it up for an audiophile sound with your CD’s or other stereo signals and instantly revert to using the Sub-Bass System as the dedicated LFE component when watching movies. This is a feature of real benefit if you wish to play music in stereo mode in the purist audiophile way and in full 5.1 digital mode. True flexibility!

On two models there is a ‘Slam’ and ‘Depth’ selector, 'Slam' mode allows you to choose a higher output level at 50Hz - 240Hz (Q100E) at the expense of maximum bass extension, and 40Hz - 140Hz (Q150E) This is an excellent ‘party’ mode where subtlety and ultimate fidelity is secondary.

Alternatively the standard ‘Depth’ mode 25Hz - 120Hz (Q100E) and 20Hz - 100Hz (Q150E) provides maximum bass extension and is strongly recommended where the highest possible fidelity is demanded. This is ideal for people in pursuit of the absolutely highest fidelity.

See the specification table on page 12 for features of the various models.

CONNECTING UP

Always switch off your system before disconnecting any wires

To increase the versatility of connecting up, the "Q" range have two separate inputs. A Neutrik Speakon socket and a pair of phono sockets. As mentioned, this is to facilitate use with both hi-fi systems and AV surround sound systems.

The high level, unbalanced, dual channel (stereo) input is via a Neutrik Speakon connector which is connected to the power amplifier's left and right channel speaker terminals. This has the advantage of ensuring that the REL receives exactly the same signal as the main speakers. This means that the character of the bass from the main system is carried forward into the sub-bass. This is a very important point and together with the REL's Active Bass Controller (ABC), ensures far superior system integration of the sub bass with the main system.

Method 1 - To Connect to the Power Amplifier Using the Neutrik High Level Input: (See Fig. 1)

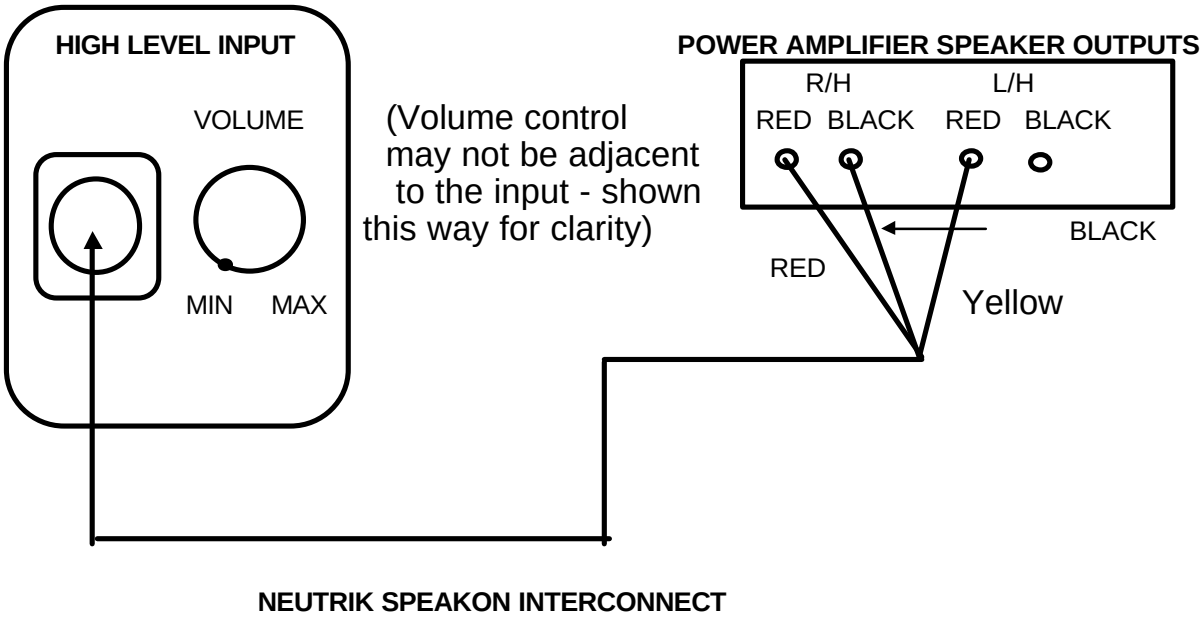

FIG. 1

Fig 1, shows pictorially how to connect to the high level input. Using the supplied Neutrik lead, connect the REL to your existing speaker plugs or to a spare set of speaker terminals. In effect the REL is bi-wired from your power amplifier. However, note that there are only three connections to your power amp. This is deliberate and helps preserve the star earthing of your system (assuming that it has a star earth arrangement). Connect the RED wire to the RED terminal of the RIGHT hand channel speaker terminal of your power amplifier. Connect the YELLOW wire to the RED terminal of the LEFT hand channel speaker terminal of your power amplifier. The BLACK wire is connected to either one of the BLACK speaker terminals of your power amplifier. Do not connect this black wire to both black terminals - this is important as some amplifiers may be damaged by joining the black terminals. Connect the Neutrik plug to the high level input on the REL.

The second of these inputs is a dual channel, unbalanced, low level LFE input via a pair of phono sockets. Signals for this input would normally be sourced from the LFE outputs of an AC3 decoder. In the absence of an LFE output, signals for this input can be sourced from a normal subwoofer output or even preamp outputs, where available. This is also the input that would be used with active speakers where direct access to the power amplifier would be difficult.

Method 2 - To Connect to the Amplifier Using the Phono Line Level Input: (See Fig. 2)

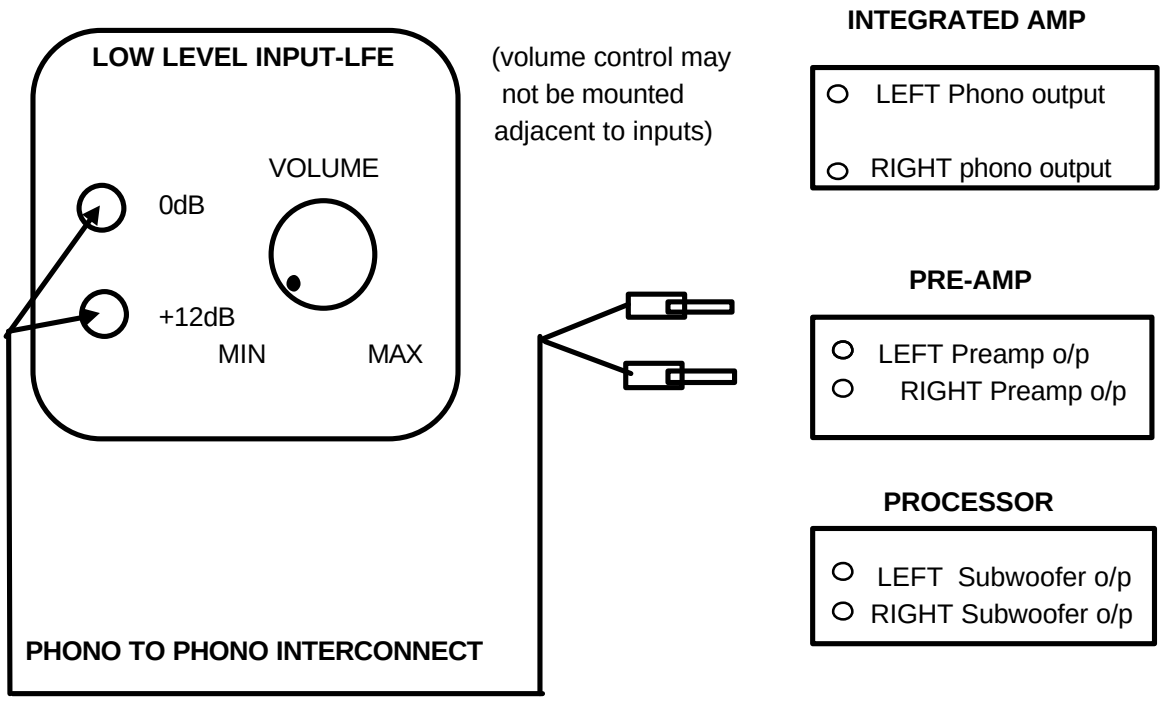

FIG.2

Fig. 2 shows pictorially how to connect to the phono line level input. Using the supplied phono to phono interconnect, plug one end into the REL Phono inputs. Plug the other end into the dedicated sub woofer output on your amplifier or processor. If a sub woofer output is not available, you can use a spare set of pre-amp outputs, if available.

If there is only a single phono sub woofer/LFE output socket on your equipment, then connect up using just one of the pair of leads supplied

Note: Both high level and low level inputs can be used simultaneously if required.

Method 3 - To Connect to the Amplifier Using Both High Level and Low Level Sub Inputs. For 2 Channel and AC3 Application: (See Fig. 3)

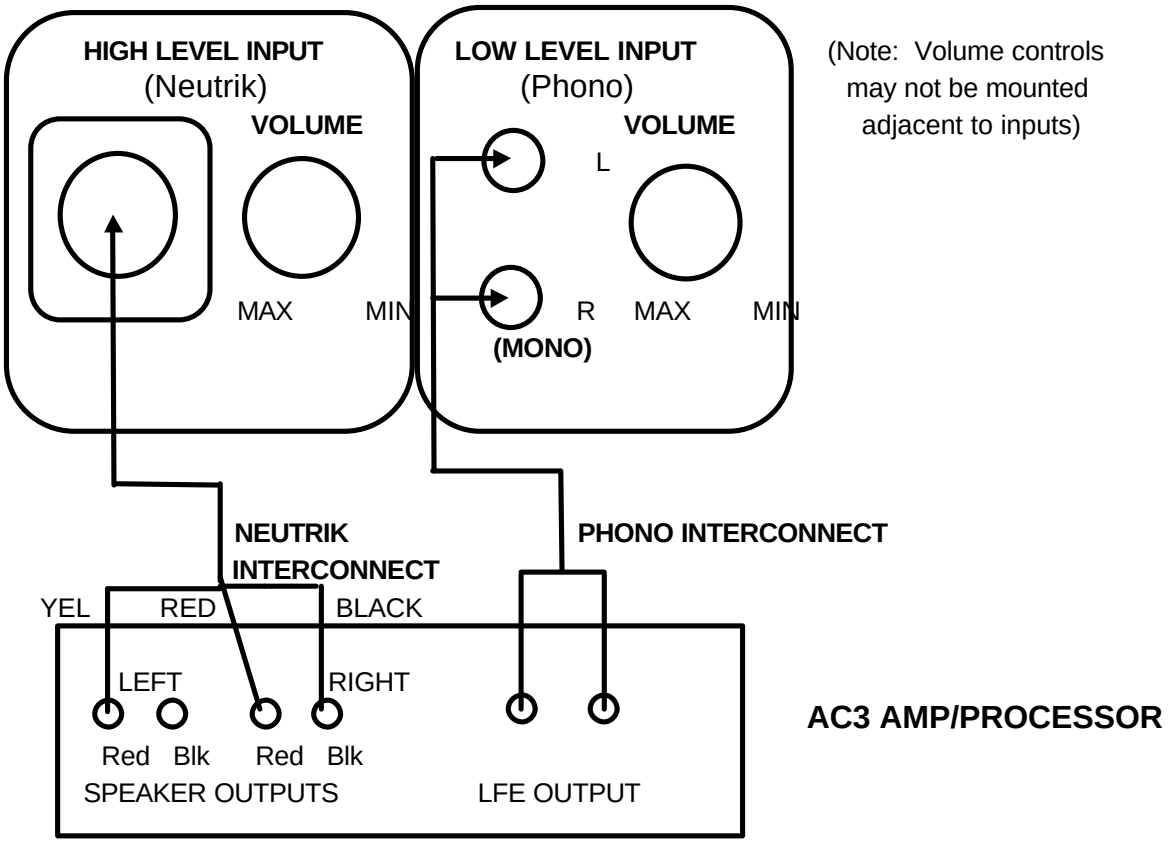

Fig. 3

Using the supplied Neutrik interconnect, connect as described in Method 1 above. Using the supplied phono to phono interconnect, connect as described in Method 2 above.

The Q200E model additionally has a mode switch. This combines the phase reversal with the LFE bypass condition. The first pair of positions offers you the choice of bypassing the ABC with the low level input. The ABC would normally be bypassed when using the LFE outputs from a processor because the low frequencies are software controlled by the processor. Whereas if a preamp output were the source, then the signal would be full-range and need to be filtered using the ABC. Thus position 1 means the ABC is in circuit and rolling off the upper bass at your preferred setting and position 2 would bypass the ABC allowing the REL to become effectively almost full range. The second pair of positions of this mode switch does exactly the same thing, but reverses the phase of the sub. Note that this phase reversal applies to BOTH high and low level inputs, whereas the filter bypass applies ONLY to the line level inputs.

The “Q” range are supplied with a set of spikes and a set of nylon screws. Always use one or the other as they form part of the cabinet seal.

Screw the spikes or the nylon screws into the base of the REL. Whichever is used, it is very important that all four are screwed in securely.

GROUND SWITCH

The ground switch provides a physical mains earth connection to the Sub Bass System if required. When the unit is connected up and switched on, listen for any 'hum' from it, if 'hum' is present then change the ground switch position from in to out (on to off for US market) or vice versa.
In the in (on) position the mains earth is connected, in the out (off) position the mains earth is disconnected.

GENERAL SETTING UP

Initially test your REL sited in any convenient position in your listening room. After you have become more familiar with its controls, you can experiment with fine tuning by varying its room placement.

If you intend to use both high and low level inputs, it is recommended that you initially set up using just the high level input, using a critical quality stereo source.

Check that the phase switch is in position 1 by using the dedicated switch or using the mode switch. Turn the filter control fully clockwise (maximum bandwidth) and both volume controls to minimum. Play some music with a known bass content and adjust the high level volume control for similar sound levels from your main system and your REL. Now reduce the filter control to minimum. Notice that the level of the bass has almost disappeared. This is because only the lowest bass is now being reproduced and these very low frequencies are not being boosted by your room. Without the ABC you would never be able to hear them properly in your room. Increase the volume control until this deep bass **is** heard. Slowly increase the filter control, noticing that the bass will appear stronger and louder. If one position appears too much, reduce the control slightly until there is a good match between the two systems. It will be necessary also, to readjust the volume control. What you are trying to achieve is a smooth transition from your main speakers to the Sub-Bass System. If there is an overlap between these two systems, the bass will appear too loud and in extreme cases will tend to boom. If there is a gap, some mid bass frequencies will appear to be at too low a volume with respect to those either side. Actually, such a "hole" in the response is generally far more subjectively acceptable than an overloud, "boomy" bass. A good test of smoothness and integration is by listening to music without significant or noticeable bass content, such as a string quartet or gentle piano. Although the REL's presence should not be obvious under these conditions, its absence when switched off, should immediately be noticed. Such things as air around the instruments, depth and sound staging will be impaired. Of course, the system has not changed, it is just the beneficial effects of a wide bandwidth are now missing. For many very critical audiophiles, these are more important benefits of owning a REL than the more often touted one of simply obvious bass extension.

Having achieved the best integration with your main speakers using the high level input, choose an AC3 (5.1 channel) configured source and test using music or sound effects with a prolific bass content. It is recommended that the filter control be left alone for this input. Only the low level volume should be adjusted to achieve best subjective effects of very low bass extension. It should be remembered that these very low frequencies do not necessarily have an acoustic equivalent, their correct level is therefore entirely subjective. If you have the Q200E model, you should put the mode switch into position 2 to bypass the filter circuit if you wish your processor to

control the filtering. (See table on page 12)

Do not worry if the correct setting is not immediately obvious. Suffice at this stage to recognise that there are differences and that one is too extreme in each direction, i.e. on maximum settings there is too much bass and on minimum settings there is too little. It will be necessary to test with different types of music and different sources with different instruments. At this stage try to get an approximate setting.

All REL models have a phase reversal switch to allow partial cancellation of the frequencies around the crossover point between the two systems. Listen to the quality of the bass with the phase switch in position 1 and then in position 2 (mode switch in position 1 or 2 then in position 3 or 4 for Q200E. See table page 12). Choose the position which subjectively offers the tightest and cleanest bass.

It may take several days before you are completely satisfied that you have found the final best setting. Your acuteness and ability to perceive very subtle differences will improve over these days, possibly because you may not have previously had the opportunity to hear very deep bass in your room. With the ABC you can site your REL almost anywhere you choose. If the bass sounds too prominent, simply reduce the filter control one or two notches. If there is a "hole", increase the filter control until it is filled in. It is often surprising just how much effect the room is having on the bass response. Sometimes even quite small speakers appear to need very low settings of the ABC. If this is the case, accept it and feel pleased that your stereo imaging extends down so far. It is always better to try and set up for a subtle, rather than an overblown effect if possible. However, personal taste is the overriding factor here. If it sounds right to your ears, it ***is*** right!

All REL Sub-Bass Systems are designed as true sub-bass speakers. They are designed to reproduce those exceptionally deep notes that are felt rather than heard. This it will attempt to do at whatever volume level you set. If set too high no damage should result because the built-in electronics will limit the cone movement. This electronic control is called ***set-safe.*** It constantly and instantaneously monitors the output from the power amplifier and is totally transparent in operation until required. This means it has absolutely no effect on the sound quality of your REL until an overload is detected.

Ordinarily an overload would cause the power amplifier to go into clipping with resultant loss of control over the drive unit. This can cause drive unit damage and always sounds nasty. ***Set-safe*** detects the point of incipient clipping and gently soft clips the waveform of the signal to ensure actual clipping does not occur. This is a necessarily simplified version of what actually happens, but it effectively controls the amplifier and ensures there is minimum risk of amplifier and driver damage caused by over-driving.

Although everything possible has been done to minimize risk of thermal overload failure, there can be no defense against those individuals who deliberately abuse the device. Such damage is NOT covered by Warranty. Please remember your REL is there to supplement your main system, not overwhelm it!

A question often asked is “Are two Sub-Bass Systems better then one?” Definitely, yes. By using two separate sub bass sources within your listening room, far better room control can be achieved. Bass is notoriously difficult to control within a listening room. Two separate sources help with system integration, dynamics, power handling and sheer realism.

TECHNICAL

The “Q” range models use an unusual method of bass loading. They are designed to operate below normal system resonance, at least over some of their operating range. This has been achieved without the normal form of bass boost or electronic equalization. Instead of a constantly increasing bass equalization response, we simply ensure there is sufficient amplifier gain to drive the speaker unit to its maximum excursion level at whatever the designated lowest operating frequency is (25 Hertz for the “Q” range models), and then cut the bass at a controlled rate of 12 dB per octave above this frequency. Although this may at first seem identical to boosting the bass, it is actually quite different and ensures that the timing of transients is far improved compared to the usual bass equalization used. We call it Zero-Q loading. The main benefit is no obvious boom or bloom to the bass. Bass will sound cleaner and faster.

For maximum performance we believe the electronics, cabinet and the drive unit should all be designed to work together.

The amplifier is fully DC coupled to avoid phase shifts and compromises in its low end performance. The three filter stages, each operating at different frequencies, are Sallen and Key two pole (l2db/octave) using high quality components. The filter capacitors are the highest quality 1% tolerance nitrogen filled polystyrene types with an indefinite shelf life. This means they are inherently stable and will retain their characteristics over very long periods of time - important in a unit designed for an exceptionally long working life. The built-in power amplifier uses either discrete bipolar (Q50/Q100E) or Mosfets (Q200/201E) for the output devices. The Q200/201E has four high current devices to ensure maximum current delivery and long term thermal stability. This amp is designed to withstand reasonable abuse and overloads.

As with all other REL units, care has been taken to deliberately over engineer it to withstand up to 300 Volts mains input. This ensures a robust, long lasting device.

POSITIONING A REL WITHIN YOUR ROOM

The “Q” range are designed to face towards the listener. It can be positioned almost anywhere that is convenient, including a corner. If the preferred position is not possible, try moving the subwoofer to one side or the other. With one unit, a corner position is normally the best position as this allows the room to be driven below its lowest resonance, its lowest eigentone.

For best results they should be used in pairs. This will offer better room coupling and increase both the dynamic range and smoothness of response and bass extension.

If you suffer from a persistent boominess, try reversing the phase on the REL. This has sometimes cured problems that users have lived with for years.

RUNNING-IN

Care taken over running-in will be rewarded by many years of pleasurable use. Each unit has been carefully pre-run for careful testing prior to leaving the factory. Despite this, both the electronics and the drive unit will benefit from an initial period of carefully controlled use. By taking a little care over this initial period, about 24 hours of actual use, a longer life with a higher potential eventual performance is assured

CARE AND POLISHING

The high quality finish is best cared for by careful dusting with a lint free cloth. Alternatively, a soft bristled brush may be used to sweep off any dust falling on the surface. If objects are to be placed upon the top, it is advisable to use a small mat to protect the surface and to avoid risk of any rattles.

Everything about the “Q” range has been designed and engineered to last a lifetime.

SOME DO'S AND DON' TS

1 Always protect the Sub-Bass System from getting wet

2. If the mains lead is lengthened (or shortened) make absolutely certain that the wires are correctly terminated before switching on.

3. In the unlikely event of a fuse failure, always replace by an identical fuse of the same rating and characteristics. A spare mains fuse is located in the sliding drawer of the mains input socket. Further replacements are available from your supplier.

4. Do not attempt to remove the panel or the drive unit from the enclosure - all Warranties become null and void if the seals are broken.

5. Never try to force the switch or the volume controls around further than their normal stops.

It is not necessary to switch off between listening sessions - it will not significantly shorten its life by leaving it switched on. On the other hand, it will not harm sound quality if it is always switched off. The power consumption in the quiescent state is negligible. It is perfectly safe under all normal domestic circumstances as it is fully protected by internal self-resetting electronic fuses and a mains fuse externally in the

sliding drawer of the mains input socket. There is a spare fuse within this compartment.

MODE SELECTOR

Q200E MODE SELECTOR		
	SOURCE	**PHASE**
1	**LINE**	**0**
2	**LFE**	**0**
3	**LINE**	**180 DEG**
4	**LFE**	**180 DEG**

SPECIFICATIONS: Q RANGE

MODEL	Q50	Q100E	Q200/201E
TYPE	Closed box working below system resonance using the unique REL Zero-Q loading system		
ENCLOSURE VOLUME LITRES	50	50	17
DRIVE UNIT	300mm long throw steel chassis	300mm long throw steel chassis	250mm extra long throw cast chassis
LOWER FREQUENCY RESPONSE IN ROOM AT -6dB	N/A	N/A	17Hz
INPUT CONNECTORS	High level Neutrik Speakon	High level Neutrik Speakon	High level Neutrik Speakon
	Low level twin phonos	Low level twin phonos	Low level twin phonos
INPUT IMPEDANCE OHMS	High level 100k	High level 100k	High level 100k
	Low level 10k	Low level 10k	Low level 10k
GAIN CONTROL RANGE	80 dB	80 dB	56 dB
POWER OUTPUT WATTS	50 RMS, 100 Peak	100 RMS, 200 Peak	200 RMS, 400 Peak
EARTH LIFT SWITCH	No	No	No
MODE SELECTOR	N/A	Slam 20 – 240 Hz Depth 20 – 120 Hz	See table above
PHASING	Positive or	Positive or	See table above
PHASE SWITCH	Position 1 gives forward cone movement for positive input		See table above
AMPLIFIER TYPE	DC Coupled bipolar	DC Coupled bipolar	DC Coupled mosfet
PROTECTION SYSTEM			
1. FULLY ELECTRONIC WITH *SET-SAFE*	Yes	Yes	Yes
2. D.C. FAULT	Yes	Yes	Yes
3. OUTPUT SHORT	Yes	Yes	Yes
MAINS INPUT VOLTAGE	220 – 240 (or 110 - 120 in certain markets) via fused I.E.C. standard socket		
FUSES	400mA semi delay, 230V operation	800mA semi delay. 230V operation	2A semi delay, 230V operation
	800mA semi delay, 115V operation	1.6A semi delay, 115V operation	4A semi delay. 115V operation
THERE ARE NO INTERNAL USER REPLACEABLE FUSES			
DIMENSIONS MM WITHOUT SPIKES	400 X 415 X 400 (WxHxD)	400 X 415 X 400 (WxHxD)	298 X 298 X 298 (WxHxD)
NET WEIGHT	16 Kg	19 Kg	17 Kg
GROSS WEIGHT	20 Kg	23 Kg	19.5 Kg
SUPPLIED ACCESSORIES			
Mains lead	Yes	yes	Yes
NEUTRIK SPEAKON INT-CONNECT 10m nominal	Yes	Yes	Yes
5 METRE PHONO TO PHONO INTERCONNECT	No	Yes	Yes
OPERATING MANUAL	Yes	Yes	Yes
SPIKES	4 x 6mm	4 x 6mm	4 x 8mm
NYLON SCREWS (fitted)	4 x 6mm	4 x 6mm	4 x 8mm
NYLON FEET			(Q201E = 4)

MODEL	Q50	Q100E	Q200/201E
GRILLE	NO	YES	200 NO; 201 YES

SPECIFICATIONS: Q RANGE (Cont.)

MODEL	Q400E	Q150E	
TYPE	Closed box working below system resonance using the unique REL Zero-Q loading system		
ENCLOSURE VOLUME LITRES	25	13	
DRIVE UNIT	300mm long throw steel chassis	300mm long throw steel chassis	
LOWER FREQUENCY RESPONSE IN ROOM AT –6dB	14Hz	19Hz	
INPUT CONNECTORS	High level Neutrik Speakon	High level Neutrik Speakon	
	Low level twin phonos 0dB and +12dB	Low level twin phonos 0dB and +12dB	
INPUT IMPEDANCE OHMS	High level 100k	High Level 100k	
	Low level 10k	Low level 10k	
GAIN CONTROL RANGE	80 dB	80dB	
POWER OUTPUT WATTS	400 RMS, 800 Peak	150 RMS 300 Peak	
EARTH LIFT SWITCH	No	Yes	
MODE SELECTOR	See table above	See table above	
SLAM / DEPTH SWITCH		Slam 20 - 150Hz Depth 20 - 100Hz	
PHASING	Positive or	Poisitive or Reversed	
PHASE SWITCH	See table above	See table above	
AMPLIFIER TYPE	DC Coupled mosfet	DC Coipled mosfet	
PROTECTION SYSTEM			
1. FULLY ELECTRONIC WITH *SET-SAFE*	Yes	Yes	
2. D.C. FAULT	Yes	Yes	
3. OUTPUT SHORT	Yes	Yes	
MAINS INPUT VOLTAGE	220 – 240 (or 110 - 120 in certain markets) via fused I.E.C. standard socket		
FUSES	5A semi delay, 230V operation	2A semi delay, 230V operation.	
	8A semi delay, 115V operation	3.15A semi delay,115V operation.	
THERE ARE NO INTERNAL USER REPLACEABLE FUSES			
DIMENSIONS MM WITHOUT SPIKES	390 X 390 X 400 (WxHxD)	290 X 290 X 320 (WxHxD)	
NET WEIGHT	Kg	Kg	
GROSS WEIGHT	Kg	Kg	
SUPPLIED ACCESSORIES			
Mains lead	Yes	Yes	
NEUTRIK SPEAKON INT-CONNECT 10m nominal	Yes	Yes	
5 METRE PHONO TO PHONO INTERCONNECT	Yes	Yes	
OPERATING MANUAL	Yes	Yes	
SPIKES	4 x 8mm		
NYLON SCREWS (fitted)	4 x 8mm	4 x 8mm	

MODEL	Q400E	Q150E	
NYLON FEET	**Yes**		

POWER SAVING EFFICIENCY

All REL Sub-Bass Systems are designed for maximum power efficiency, both when passing a signal through to its resultant output sound into the room and also when silent.

REL circuitry is designed for “power starvation” operation under no signal conditions. This means that immediately there is a gap in the signal the sub is instantly at maximum power saving efficiency; yet remains at maximum readiness to respond immediately to a sudden transient signal, such as an explosion in a movie, even after a long quiet period and at whatever level.

This compares to some “auto turn-off/on systems” which remain powered up under no signal conditions for perhaps 10 or 15 minutes and then after powering down, need a finite time to power-up again on receipt of a signal. This means some subs can power down during a quiet interval and then fail miserably to respond to a sudden transient. There is also the possibility of the Sub-Bass System remaining inoperative during listening sessions where the overall volume is low. This cannot happen with the REL.

It is not necessary to switch off between listening sessions - it will not significantly shorten its life by leaving it switched on. On the other hand, it will not harm sound quality if it is always switched off. The power consumption in the quiescent (no signal) state is negligible. REL’s power starvation technology uses less than 4 Watts when idle (less than 1/25th the power of a standard light bulb).

It is perfectly safe under all normal domestic circumstances as it is fully protected by an external mains fuse in the sliding drawer of the mains input socket, with a spare inside this drawer.

Please Note

This apparatus is designed to Class II specification and is double insulated, therefore it does not require to be earthed.

UK OPERATION

This apparatus is supplied with a fitted three pin mains plug. A 5 Amp fuse is fitted in the plug. Should the fuse need to be replaced use a similar rated fuse approved to ASTA or BSI 362. Do not use without the fuse cover in place. Replacement fuse covers are available from your dealer.

If for any reason the plug is cut off it must NOT be re used. Please dispose of any such plug safely. There is a danger of electric shock if the cut-off plug is inserted into a 13A mains socket.

IMPORTANT

The wires in the mains lead are coloured in accordance with the following code:

Green and Yellow	-	Earth
Blue	-	Neutral
Brown	-	Live

As the colours of the wires in the mains lead may not correspond with the markings identifying the terminals in the replacement mains plug, proceed as follows:

- the wire coloured Green and Yellow must be connected to the terminal marked with the letter "E" or with the earth symbol ⏚ or coloured Green or Green and Yellow.
- the wire coloured Blue must be connected to the terminal marked with the letter "N" or coloured Black.
- the wire coloured Brown must be connected to the terminal marked with the letter “L" or coloured Red.

This product is CE marked and has been tested to ensure it satisfies all relevant standards for EN 50081-1 using the limits of EN 55022 class B and IEC 801 - 4 wherever relevant.

It satisfies all tests for Conducted Emissions, Radiated Emissions, Susceptibility and Immunity.

It also complies with the requirements relating to class II construction detailed in clauses 9 & 10 of BS EN 60065 1994

It also satisfies all relevant safety tests for consumer use provided it is used within the guidelines of this manual.