PRO SERIES

High-performance 4 channel power amplifier

# R4-150 Pro

MANUAL


ACOUSTIC ENGINEERS

ATC®

## SAFETY INFORMATION

**1** Read instructions – all the safety and operating instructions should be read before the appliance is operated.
**2** Retain these instructions – the safety and operating instructions should be retained for future reference.
**3** Heed warnings – all warnings on the appliance and in the operating instructions should be adhered to.
**4** Follow instructions – all operating and other instructions should be followed.
**5** Do not expose to rain or moisture – the appliance should not be used near water, for example near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement or near a swimming pool etc.
**6** Ventilation – the appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings. Similarly, the appliance should not be built into an installation, such as a bookcase or cabinet, that may impede the flow of air through the ventilation openings.
**7** Heat – the appliance should be situated away from heat sources such as radiators, stoves or other appliances that produce heat.
**8** Power sources – the appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
**9** Power cord protection – power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles and the point where they exit the appliance.
**10** Cleaning – the appliance should be cleaned only as recommended by the manufacturer.
**11** Unattended periods – the power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
**12** Object and liquid entry – care should be taken so that objects and liquids do not fall into the appliance.
**13** Damage requiring service – the appliance should be serviced by qualified service personnel when:
i the power supply cord or the plug has been damaged objects have fallen or liquid has been spilled into the appliance
ii the appliance has been exposed to rain or other serious liquid exposure
iii the appliance does not appear to operate normally or exhibits a marked change in performance
iv the appliance has been dropped or the cabinet damaged.
**14** Servicing – the user should not attempt to service the appliance beyond those measures described in the operating instructions. All other servicing should be referred to qualified service personnel.
*Opérations de maintenance: toutes les opérations de maintenance au-delà des opérations décrites dans le manuel d'utilisateur doivent impérativement être confiées à un technicien qualifié. Veuillez contacter votre revendeur ou distributeur ATC.*
**15** Mains polarisation – precautions should be taken so that the power Live and Neutral polarisation remains correct.
*ATTENTION: Ce produit est muni d'une prise polarisée. Ne pas la modifier ou utiliser un adaptateur — danger de choc électrique.*
**16** This equipment must be earthed.
*ATTENTION: Cet équipement doit être relie à la terre.*


## CONTENTS

## 1.1 Welcome

In selecting ATC you have chosen an example of the finest audio engineering available. ATC was founded on a principle of engineering excellence, and that principle still defines our products today. Given the right opportunities, ATC products will deliver exceptional audio performance, but the opportunities will only arise from careful and thoughtful installation and use. Please read the following manual fully. It will help you understand the product and to realise its full potential. If you need further assistance, please contact your local ATC representative. ATC contact details can be found at the rear of this manual.

ATC's reputation for the design and manufacture of unique, high-performance loudspeaker drive units is legendary, with new concepts continually evolving and being perfected since its inception in 1974. The same is true of ATC's equally innovative and successful high-performance audio electronic products.

It all started in 1982 with the EC23, a stereo 3-way electronic crossover incorporating phase correction and momentary gain reduction – features that are incorporated in all ATC active loudspeaker systems to this day. The EC23 was the controller for all large ATC active loudspeakers right up until the development of the SPA24-850 in 1996, a stand-alone stereo Ampack for the control and amplification of SCM200 and SCM300 monitors. But it was the development of the SCM50A active 3-way monitor in 1985 that changed everything.

An aluminium plate and heatsink bolted straight into the back of the loudspeaker cabinet, onto which three power amplifiers were mounted: 200W bass, 100W mid-range, and 50W high-frequency, incorporating phase correction and momentary gain reduction. This technology is why all ATC active monitors have a flat magnitude response, an excellent minimum-phase response, and are factory-set to prevent the amplifiers from clipping when driven hard. There is nothing else that sounds better or offers such great value.

Over the years ATC has continued to develop and expand both its HiFI and Professional electronics range and today, ATC has a broad palette of high-performance audio electronic products, catering for the entire signal chain from source through to power amplification.

From modest beginnings ATC has grown to become one of the very few manufacturers successful across both domestic and professional audio. By selecting ATC you join a group of music lovers, professional audio engineers, studios and musicians across the World that understand and value the engineering that goes into an ATC product – and the sound that comes out.

## 2.1 R4-150 Pro – Product Description

The R4-150 Pro is designed to delivers four discrete channels of high-performance power amplification within a robust 5U rack-mount chassis. It provides an ideal solution for driving surround and height channels in multi-channel or immersive audio systems. Each channel operates independently, featuring its own dedicated power supply and delivering 150W into 8Ω with exceptionally low noise and distortion.

The amplifier employs a Class A/B Grounded Source topology combined with ATC's Active FET Momentary Gain Reduction limiting, and incorporates updated input circuitry for superior common-mode rejection.


## 2.2 Unpacking and Handling

The R4-150 Pro is a heavy item and should be handled with care. The amplifier is packed in a crate and may be delivered on a pallet. It is recommended to remove the crate from the pallet and unpack it on the floor or a sturdy, low table with ample open space around the crate, ideally near the final installation location.

Simply unscrew the crate cover and remove any loose items from within the crate. With assistance, lift out the amplifier – it is heavy!

## 3.1 Installation and Connection

ATC equipment has been designed to remain powered-up in Standby mode unless it is to be unused for a long period of time. Power dissipation will make the unit warm to the touch in either standby or operational mode. Temperature stability will be reached after approximately three hours from mains switch-on. Full audio performance is available immediately.

All power amplifiers should ideally be located to minimise the cable lengths between the power amplifier and loudspeakers. Longer line level interconnects are favourable over long high level speaker connections. Use of loudspeaker cables over 10m/33' should be avoided if possible, to prevent a possible degradation in sound quality. Long cable runs require the use of a larger gauge cable. ATC recommend a minimum cable conductor area of 2.5mm2/14G for cable runs of up to 5m/16' and 4.0mm2/12G for runs up to 10m/33.'

The R4-150 Pro is a precision audio instrument and to ensure optimal performance, care should be taken when installing it into your system. The 4 x independent power amplifiers are class A/B designs and are optimised for sound quality over efficiency. As a result, they run warm and extra care should be taken when positioning and/or rack mounting to ensure they do not overheat.

## 3.2 Rack Mounting

- Rack mount amplifiers with a minimum of 1U free space above AND below each unit (see diagram 1).
- When blanking free spaces above/below amplifiers, vented rack panels must be used (see diagram 1).
- Only fit into racks with ventilated side and top panels and take care not to block top panel venting (see diagram 1).
- Take care to secure amplifiers using screws in all eight rack mounting points – the amplifiers are heavy.
- Take care that the ambient temperature in the space the amplifiers is mounted in does not exceed 30°C.

If you as the user are uncomfortable in a space, don't site an amplifier there.

Above all, use common sense and, if in doubt, allow extra ventilation. This will result in a lower operating temperature and extend the life of the product.

Failure to comply with the guidelines above could result in the amplifiers thermal overload sensor being tripped, and the amplifier shutting down. Running the amplifiers for extended time periods at high temperature will reduce the life of the product.

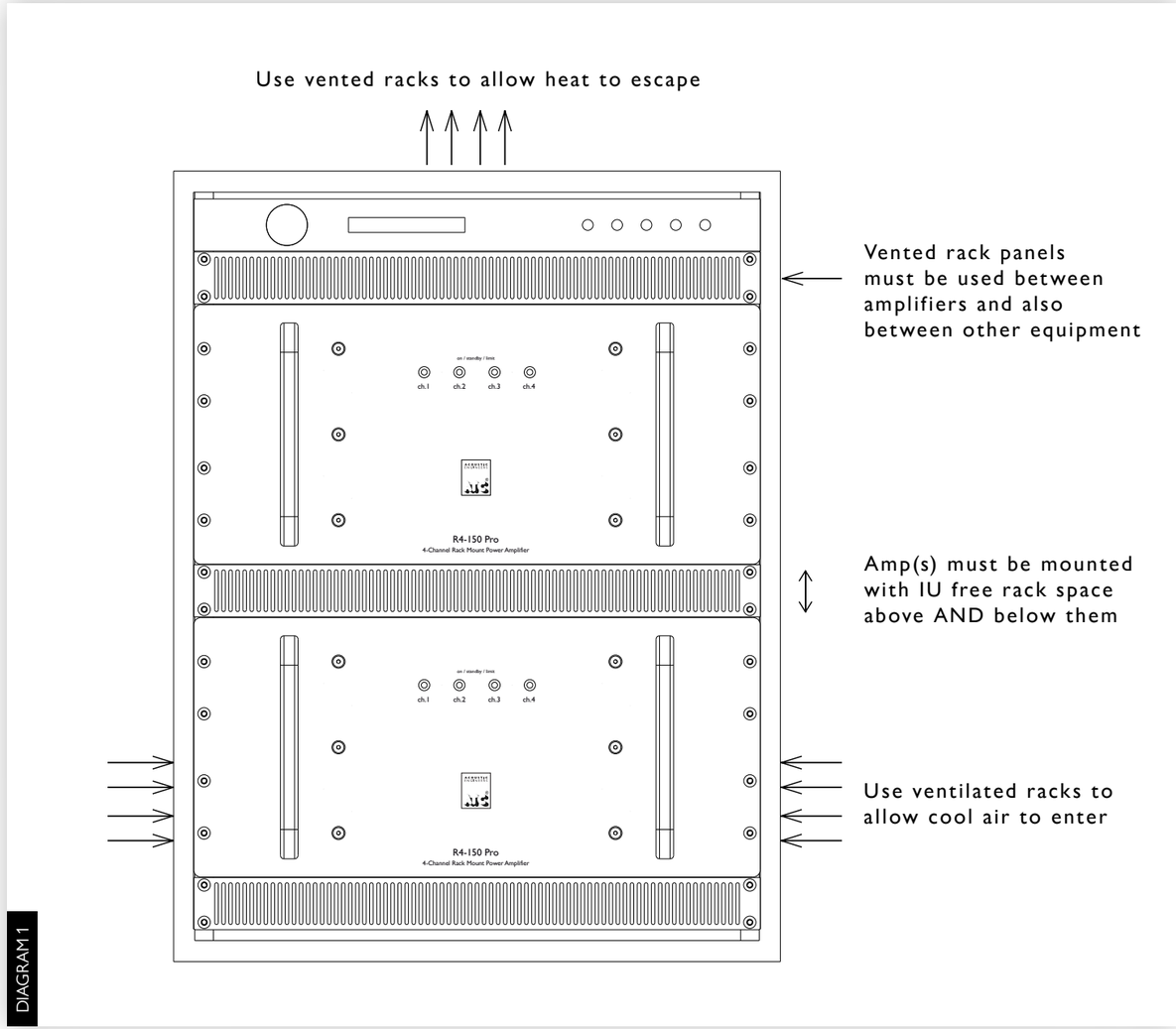


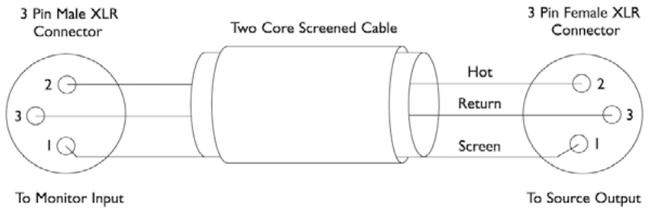

DIAGRAM 1

## 3.3 Signal Cable Connections

Balanced cable configuration is the preferred option, however unbalanced connection is possible. Diagrams 2 and 3 illustrate the signal cable connections required for each option.

Balanced (XLR - XLR) connection offers lower noise and better immunity to "hum" pick-up. Unbalanced (XLR - RCA Phono or two-pole jack) connection carries risk of "hum" caused by multiple signal earths. Hum problems resulting from unbalanced connection may be reduced by making ONE of the following modifications to the signal cable:

a) If the driving pre-amp or desk is "double insulated" (ie. has no mains earth), disconnect the signal cable screen at the RCA phono plug end, or
b) Disconnect the signal cable screen at the XLR end. This option will make the source the reference signal earth.



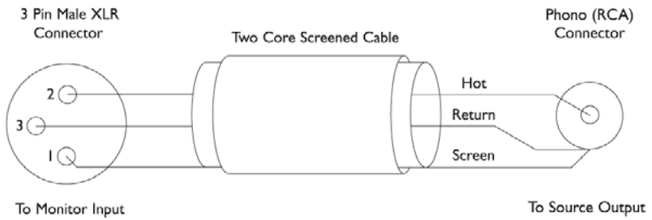




DIAGRAM 2

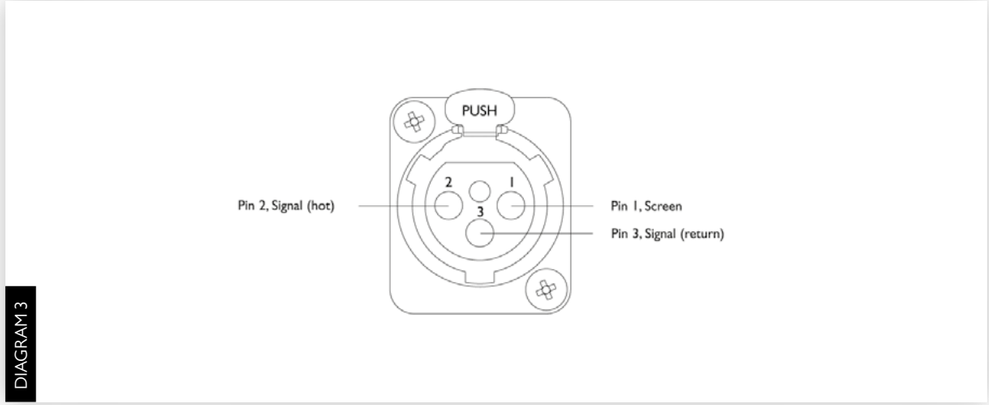



DIAGRAM 3

## 3.4 Mains Power Connections

Mains voltage is factory set and should only be adjusted by ATC or your local dealer or distributor. Please ensure that the local mains voltage matches that specified on the rear panel before applying power to the R4-150 Pro power amplifier.

The mains cable has been specifically supplied to comply with local statutory safety approvals and alternatives should not be substituted. If you intend to use your unit in an alternative territory, please contact ATC for advice.

ATC equipment MUST be earthed. Do not remove the earth wire in the mains plug.

## 3.5 Fuses

The mains power supply fuses for the R4-150 Amplifier are located on the rear panel. Should the amplifier fail to switch on when the power switch is operated, the fuses should be inspected.

PLEASE ENSURE THAT THE UNIT IS DISCONNECTED FROM THE MAINS SUPPLY BEFORE INSPECTING OR REPLACING A FUSE.

Lift out the fuse holder cover using a small screwdriver, remove the fuse and inspect it for damage. Fuses most often fail due to a serious electrical fault. Only replace fuses with the same type as that suspected to be blown. All fuses are 20mm "TypeT anti surge." The fuse rating is printed on the rear panel adjacent to the fuse. If a replacement fuse also fails, then the Amplifier should be returned to ATC or your local distributor for service.

## 3.6 Input Connections

Differential (balanced) inputs via XLR sockets are provided. These have extremely high CMMR (Common Mode Rejection Ratio), allowing for longer balanced cables to be used if necessary, so that the amplifier can be located in a remote and convenient location, and to enable the use of shorter output cable connections.

## 3.7 Output Connections

Loudspeaker connections are made using Neutrik Speakon NL4 connectors. These carry 1 channel of amplifier outputs each, on pins 1+ & 1-, and have high current self-cleaning contacts for long term stability.

## 3.8 5V Trigger Input

The R4-150 can be switched ON and OFF remotely using its 5V Trigger Input. Two connector types are provided:

• 3.5 mm Jack socket. Tip +ve, Sleeve Ground. See diagram 4.
• Omnimate Pin Header / 3.5mm Plugin terminal block (compatible with Weidmüller BL Series pluggable terminal block). Left pin +ve, Right Pin Ground. See diagram 4.

Only one trigger input should be connected at any time.

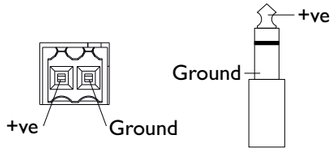
**Trigger Mode Switch Operation**

The Trigger Mode switch reverses how the unit responds to a 5V trigger signal:

*Inward position*
• With the power button in the inward position, the R4-150 will power ON.
• If a 5V signal is then applied to the Trigger Input, the unit will power OFF.

*Outward position*
• With the power button in the inward position, the R4-150 will not power on by itself.
• Applying a 5V signal to the Trigger Input will power the unit ON.

DIAGRAM 4



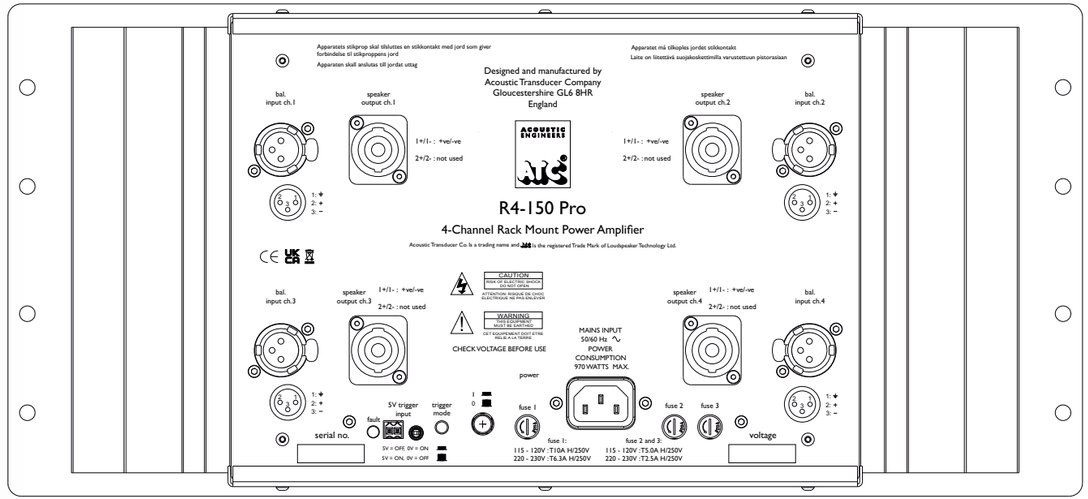

## 3.9 Fault LED

If either of the heatsink temperatures exceed 70°C during use, their thermal overload feature will be triggered, and the amplifier will shut down, disabling power to the output stages and displaying the red, 'fault' LED on the rear panel. This feature is to ensure long term reliability and reduce the chance of serious output stage failure. Some hysteresis exists within the thermal sensor, so the amplifier will need to cool to well below 70°C before it can be reset and operated. This may take as long as 30 minutes.

If thermal overload is triggered, it is highly likely that the amplifier is:

a) Being continuously overdriven
b) Driving a very demanding load
c) Installed in a location with a high ambient temperature (>30°C)
d) Installed in a manner that restricts normal cooling.

DIAGRAM 5



## 4.1 Operation

The amplifier mains power is turned on using the power switch on the rear panel. There are 4 x Green LEDs on the front panel that illuminate green to indicate that the mains supply is connected to each channel. Please refer to Sections 3.4 and 3.8.

When the amplifier reaches the limiter threshold, the LEDs will begin to illuminate RED. A short low intensity 'blink' indicates the limiters are just beginning to work. A longer duration, stronger 'blink' indicates greater limiter action. If the limiters are active, the dynamic behaviour of the signal will be modified, output distortion will increase and subjective sound quality will be reduced. If the limiters are active, we strongly advise reducing the input level to prevent potential loudspeaker damage or thermal shutdown of the amplifier.

These features are to ensure the longevity of the amplifier and protect loudspeakers from potential damage. Please take note!

Due to the nature of the electronics in ATC amplifiers it is quite normal for a sound to be heard from the speaker when the power is applied or disconnected. The noise heard will not damage the speaker and is quite normal. Although ATC uses the highest-grade components, a different noise may be heard from each speaker due to slight tolerance variations in the amplifier components.



## 5.1 R4-150 Pro – Electronic Specifications

Balanced Input: Rear panel mounted 4 x female XLR, pin 2 +ve.

Input Impedance: 20kΩ (differential).

CMRR: > 80dB (20hz to 20kHz).

Input Sensitivity: 8.9dBu / 2.15Vrms (ref. full output).

Amplifier type: Grounded Source MOSFET Class AB, convection cooled.

Output Power: 150W/Ch. (8Ω all channels driven, continuous average, 0.1%THD).

THD+N: 0.0007% / -103dB (1kHz, 1dB below rated power, 20kHz BW).

Residual noise: 39uV (20Hz to 20kHz).

S+N/N: 119dB (ref. 150W unweighted).

Frequency Response: <5Hz to >400kHz (-3dB).

Crosstalk: >100dB (20Hz to 20kHz).

Damping factor: >500.

Limiter: ATC Active FET Momentary Gain Reduction, limiter 'active' indicated on front panel.

Output Connection: 4 x NL4 (pins 1+, 1-).

Electronic Amp Protection: Amplifier d.c. offset and over-temperature (both indicated by rear panel LED).

Power Consumption: *Standby* 4W / 4.6VA
*Idle* 82W / 117VA
*1/8th power* 361W / 478VA
*Full power* 956W / 1161VA.

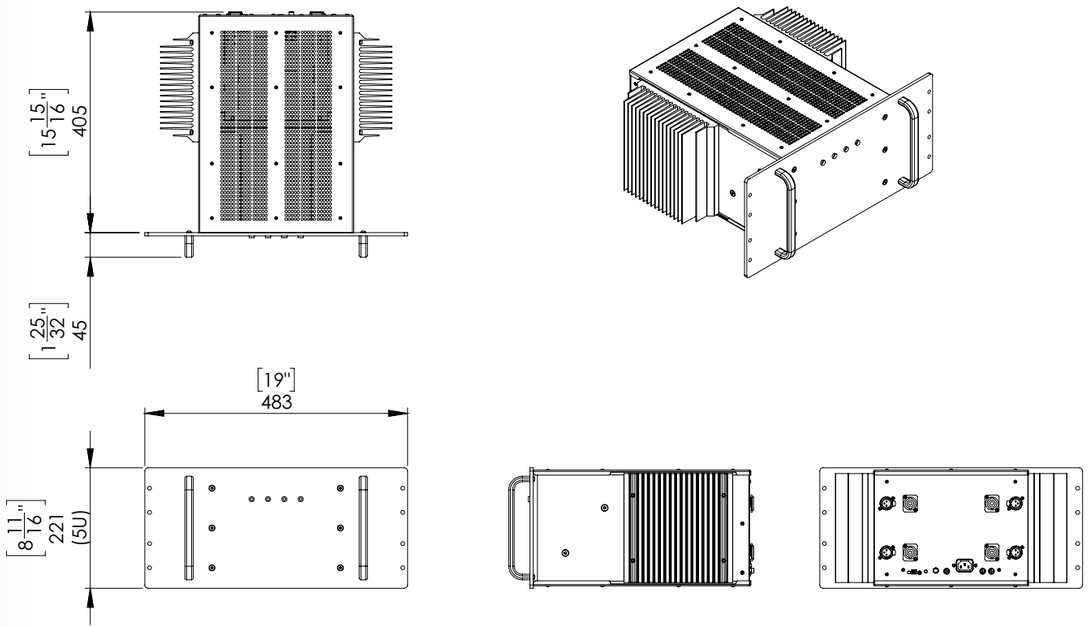
Mains Input: 220-230V, 110-115V – Factory set. Please observe panel markings and labels.

Heat Output: *Standby* 13.6 BTU/hr
*Idle* 278 BTU/hr
*1/8th power* 975 BTU/hr
*Full power* 1215 BTU/hr.

Additional: Standby mode via 1/8"/3.5mm Jack socket & 3.5mm right angle header.

## 5.2 R4-150 Pro – Physical Specifications

Net Weight: 26kg / 57.3lbs.
Product Dimensions: See diagram opposite.



## 6.1 Care & Maintenance

ATC uses high technology material finishes in all of its products. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster is all that is required to keep the finishes clean. Heavy soiling can be cleaned using a slightly moistened cloth with a non-abrasive household cleaner. There are no components within the amplifier that can be considered expendable, or that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance. There are no user-replaceable parts within the amplifier, and in the unfortunate event of any malfunction, repair should be referred to either the supplying dealer or consultant, the relevant importer, or ATC. ATC has every confidence in the quality of each product that it manufactures.

## 6.2 Warranty

All ATC products are guaranteed against any defect in materials or workmanship for a period of two years from the date of purchase. Within this period, we will supply replacement parts free of charge provided that the failure was not caused by misuse, accident or negligence. Purchasers who complete the Product Registration process, either by returning a completed Warranty Card to ATC or by registering the product at www.atc.audio, will have their warranty period extended up to a period of six years from the date of purchase.

This product warranty does not provide cover for:

- Damage caused by improper handling (e.g. drop/impact, water, dust/sand).
- Any damage, injury or harm caused by the improper installation, fitting, mounting, suspension, connection or commissioning of ATC products by the Customer or a third party installer.
- Faults resulting from normal use or wear and tear, or normal ageing of the product.

This guarantee does not limit statutory rights.

## 6.3 Contact

Loudspeaker Technology Ltd
Gypsy Lane, Aston Down
Stroud, Gloucestershire
GL6 8HR
United Kingdom

Telephone +44 (0)1285 760561
Email: info@atc.audio
Website: www.atc.audio




Loudspeaker Technology Ltd
Gypsy Lane
Aston Down
Stroud
Gloucestershire
GL6 8HR
United Kingdom

Telephone +44 (0)1285 760561
Email: info@atc.audio
Website: www.atc.audio



**50 YEARS IN THE MAKING**