



Analog Domain Audio GmbH

ISIS M75P MK II

Audio power amplifier



The Isis M75P in Silver

Owner's manual

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Congratulations on your purchase!

The Isis M75P power amplifier employs state of the art proprietary technologies, yet has been designed to be simple, intuitive and reliable in use. We encourage you to read through this manual in its entirety to better understand and utilize its features.

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The technology inside

The Isis M75P is a precision, solid state linear amplifier, intended for amplifying audio frequency signals. It is the product of over 15 years of circuit refinement, aiming to escalate the quality of audio reproduction to the highest level of fidelity. The proprietary circuit technology combines high performance with high efficiency and high reliability.

The operating mode of the Isis M75P is Class AB+G. Efficiency is greatly enhanced by employing a tiered power supply with proprietary voltage management in the power stages, thus providing high output power while minimizing power waste and consequent heat. Build quality is to the highest standards, ensuring many years of reliable operation.

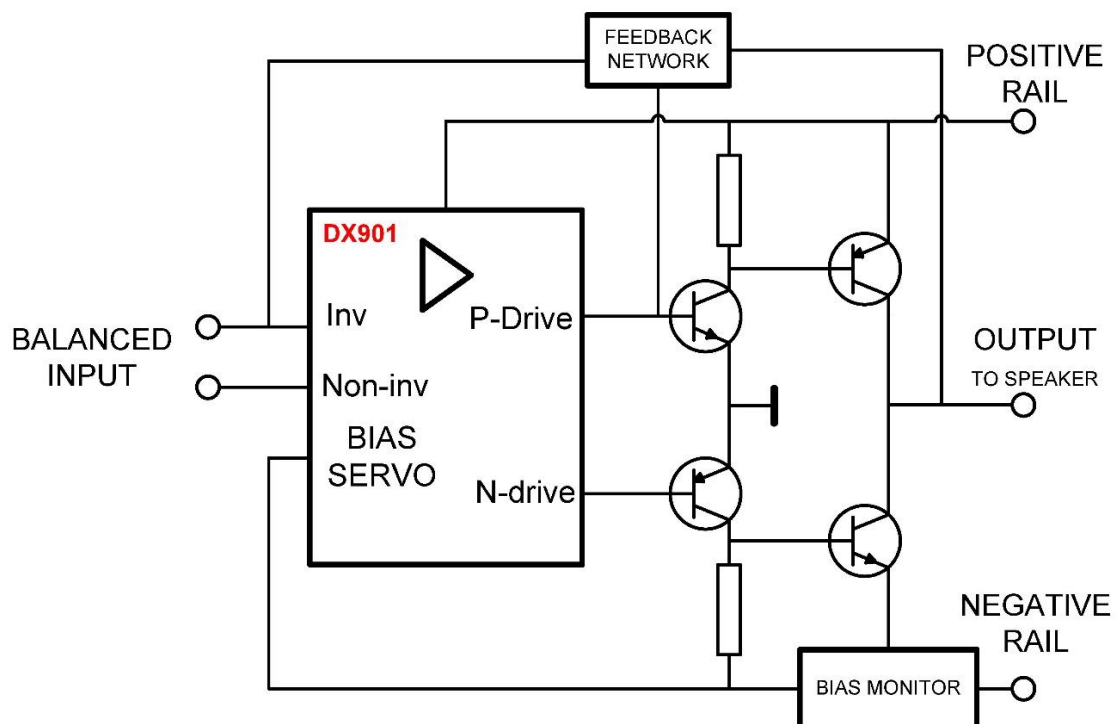
Excalibur and DXDrive™

The Isis M75P features an unconventional output stage topology which is superior to the ubiquitous emitter follower in many ways. We named this topology “The Excalibur”. While lucrative, this topology poses significant technical challenges if attempted with conventional bias control methods. The combination of the Excalibur with our proprietary DXDrive™ bias control enabled the use of this topology, achieving unprecedented performance and reliable operation.

The Excalibur topology needs very little bias current to achieve near Class-A performance, which in turn contributes to overall efficiency and longer life of components. The Isis M75P produces much less heat in comparison to conventional amplifiers with similar ratings under identical conditions.

THE EXCALIBUR CIRCUIT

SIMPLIFIED SCHEMATIC



What sets the Excalibur topology apart from common designs are the virtually unlimited current output capability and the extremely low output impedance. Driving real world loudspeakers is where the Excalibur excels, providing as much current as the speaker demands. There are no “difficult” loads for the Excalibur. Peak output current has been intentionally limited only for safety and reliability.

Tiered power supply

The Isis M75P-MKII features a tiered power supply. Two voltages of each polarity are provided to the power stages. The lower voltage is used in when the amplifier is idle or playing at moderate levels.

A management circuit continuously tracks the output signal and will momentarily switch the respective rail of the power stage to the higher voltage during a peak. The transition is seamless.

Symmetrical loading

In conventional designs, the power stages operate in phase and draw current from the same pole of the power supply during simultaneous transients. This may cause a significant voltage sag and consequent limitation of headroom, especially during simultaneous low frequency transients.

The two power stages in the Isis M75P operate in inverse phase relative to each other, whereby the RIGHT channel is electrically inverting. It draws power from the negative supply pole during a positive peak, while the LEFT channel is non-inverting and draws power from the positive supply pole. This has the effect of virtual doubling of the reservoir capacitors, providing twice the energy to the power stages relative to a conventional design.

A further advantage comes from the way the signal is inverted in the right channel. Conventional designs employ an extra phase inverter stage in the signal path. This inevitably introduces some lag and distortion. As the power stages of the Isis M75P have balanced inputs, phase inversion is achieved by wiring the input of the RIGHT channel inversely, thereby eliminating the need for a phase inverter stage. Proper phase at the output is achieved by connecting the speakers in accordance with the colours of the binding posts – the red binding post is connected to the positive terminal of each speaker.

Getting started

For simplicity we shall refer to the two operating modes as follows:

“ON” state – the amplifier is operating. Power LED glows white.

“OFF” state – the amplifier is in standby mode. Power LED glows red.

Some circuits and the reservoir capacitors remain powered in the OFF state. Total power draw in this state is under 1W. If the amplifier will not be used for prolonged intervals, we recommend the mains power be switched off via the mains switch on the rear panel.

Installation

The Isis M75D is designed for indoor use only. Place on a firm surface out of direct sunlight which provides adequate support. Avoid placing close to heat producing appliances. The Isis M75P features passive convection cooling and requires clearance at least 15cm (6”) to the side and above the amplifier to allow adequate airflow. Do not cover the cabinet or block the openings in the top plate. Inadequate airflow may lead to overheating and temporary disruption of operation.

The cabinet feet can be extended by up to 3mm (1/8”) from their fully retracted position to allow for perfect leveling. Start by screwing all feet to their fully retracted position. Adjust feet until the cabinet is horizontal and all feet are making equal contact with the supporting surface.

Making connections

Before making connections to the amplifier, ensure that it is off and any source or preamplifier is in mute or stand-by mode. Make sure all cable terminations are of the highest quality and free from frayed ends, short circuits, or cold solder joints. Plugs should be fully inserted into the respective sockets and binding posts tightened. Do not over-tighten – hand tightening is sufficient.

The circuitry employed in the Isis M75P amplifier requires special attention when connecting speakers. Do not connect the negative speaker terminals together. Do not connect the negative speaker terminals to ground or attempt to bridge the left and right speaker binding posts. Do not connect the amplifier to a speaker selector device that employs a common ground scheme, as it may short-circuit the amplifier output.

Using a tube preamplifier

The high DC voltage output of some tube preamplifiers may exceed the DC compensation and protection circuitry of the Isis M75P, and cause disruption of operation. Excessive DC level in a signal can damage amplifiers, speakers, or both. Coupling capacitors must be inserted into the signal path, preferably at the output of the preamplifier, by your authorized dealer, distributor, or the factory before you can use your Isis M75P amplifier with a tube preamplifier.

Voltage selection

The Isis M75P will accept either 115/120V or 230V, 50/60Hz mains voltage. The voltage selector is located on the rear panel below the mains inlet socket. You will need a small flat-blade screwdriver to slide the voltage selector actuator to the correct position.

WARNING: Make sure the voltage selector is set to the correct position for the voltage in your area before connecting the power cord! Incorrect setting may damage the amplifier.

ALWAYS DISCONNECT THE POWER CORD BEFORE SWITCHING THE VOLTAGE SELECTOR!

Mains power switch

The mains switch is a high performance thermal circuit breaker. It will cut off power in case of severe overload or a malfunction. There is no separate fuse outside or inside the cabinet.

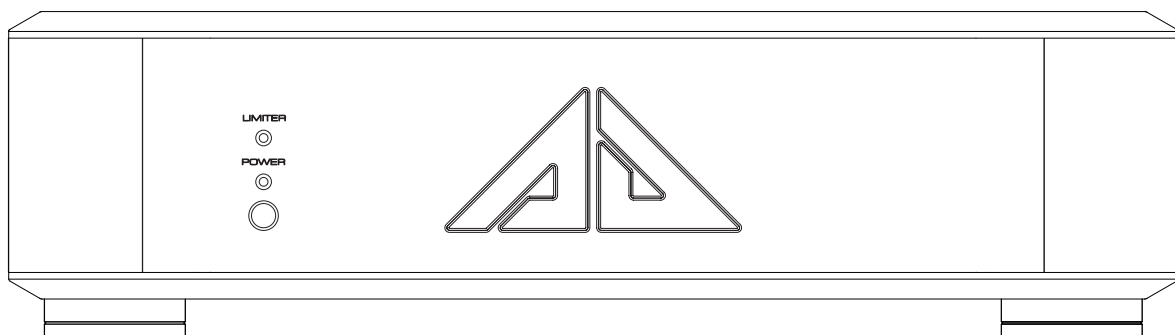
The quality of the mains power supply is important for safety and reliable operation. A brownout may force the amplifier into standby or trip the mains circuit breaker. Should this occur, toggle the mains switch to reset it. Consider installing a power conditioner of sufficient rating. The Isis M75P is sold without a power cord. Make sure your preferred power cord has three lines and that the wall socket is properly wired: the earth/ground tab should be wired either to ground or to neutral at the socket.

Soft start

When mains power is applied, an inrush current limiting circuit will engage to gradually charge the main reservoir capacitors. The charging time depends on how long the amplifier has been switched off and can last up to 30 seconds. It is not possible to operate the amplifier during the charging cycle.

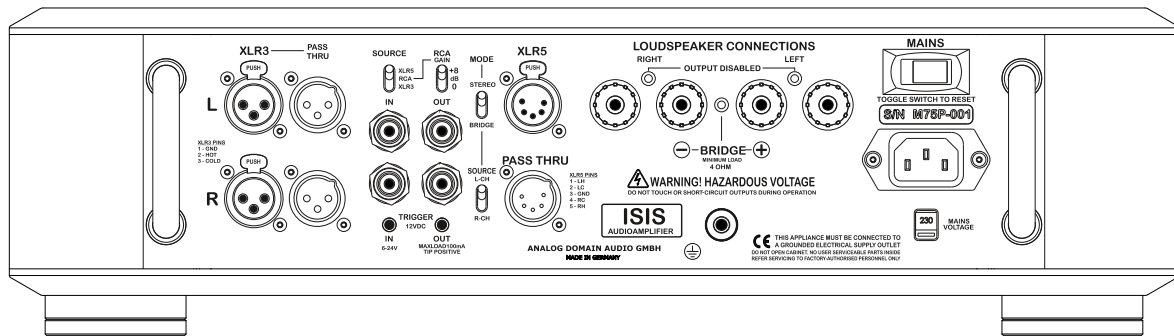
When the charging cycle is complete, a soft click will be heard and the POWER LED on the front panel will glow red, indicating that the amplifier is ready for operation. If the POWER LED does not illuminate within 30 seconds, check the power connection, verify presence of mains voltage and correct setting of the voltage selector.

Front panel layout



1. POWER button. Power LED glows red in standby, white when the amplifier is on.
2. Limiter/Status LED, normally off. Glows white when the clipping limiter is activated, red if there is a fault condition.

Rear panel layout



Source selection

The signal source is selected by the 3-position “SOURCE” switch on the rear panel.

The M75P will accept both balanced signals through the XLR input sockets as well as unbalanced signals through the RCA sockets. If using an outboard control amplifier, please use either the regular XLR or RCA inputs. There is no signal degradation, regardless which input is used.

XLR Balanced line input

This input will accept a differential (balanced) signal from a source with balanced output.

Pin assignment:

- 1 – Ground
- 2 – Hot (positive phase)
- 3 – Cold (negative phase)

RCA input

The RCA input features gain control via a switch located on the rear panel above the RCA sockets. The intended purpose of the gain control is to compensate for sources with inadequate output level. Digital sources typically provide 2Vrms, whereas analog sources are typically at 0.7Vrms. The difference can be compensated by applying +8dB gain (x3 voltage gain).

The +8dB setting is useful when a source with unbalanced (RCA) outputs cannot provide sufficient voltage to achieve the full power output of the M75P at its maximum output level. Nominal system gain is +26dB (20x) in stereo mode and +32dB (40x) in bridge mode.

The XLR5 input

A 5-pin XLR female socket is provided for direct input to the power stages. This input should be used when connecting the Isis M75P to an upstream Isis M75D integrated amplifier, to achieve either a bi-amp 2x2 parallel configuration or a stereo configuration using each amplifier as a single channel in bridge mode. We offer custom high performance cables of various lengths to link M75 series amps in direct mode through the XLR5 connection.

Pin assignment of the XLR5 sockets:

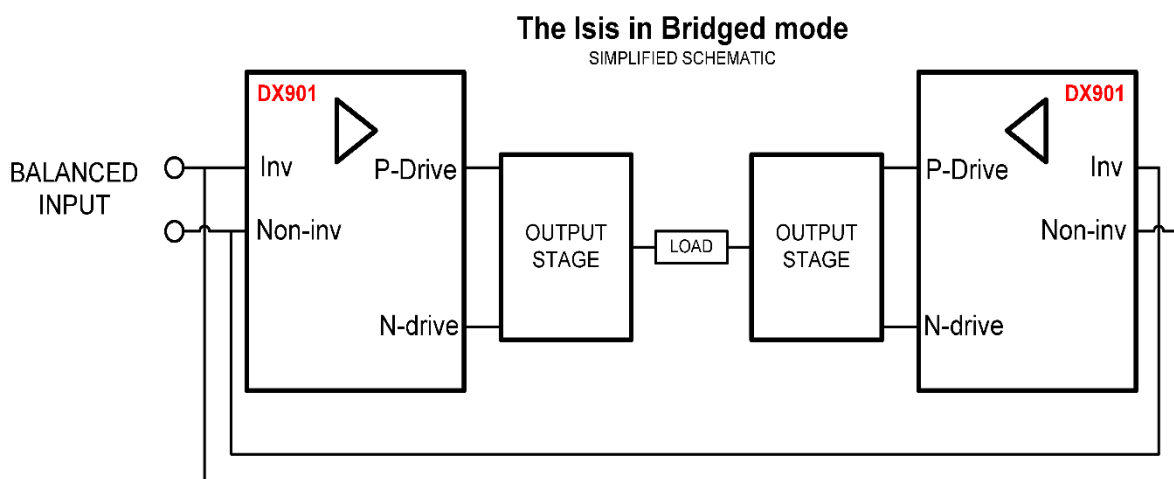
- 1 – Left HOT (L+)
- 2 – Left COLD (L-)
- 3 – GROUND
- 4 – Right COLD (R-)
- 5 – Right HOT (R+)

The XLR5 input should only be used with balanced sources. Do not attempt to re-wire cables for unbalanced sources. If you use an unbalanced source (e.g. control amplifier) that has unbalanced outputs, please use the RCA input on the Isis M75P.

Bridge mode

Bridge mode transforms the Isis M75P into a high power, balanced, single channel amplifier. Both power stages are driven by the same signal, yet work in inverse phase relative to each other to provide more power and reduced distortion. Distortion reduction occurs through cancellation of the even-order harmonics due to the symmetry of the topology. You will need a second amplifier for a stereo setup.

Switching modes should be done only while the MAINS power is switched OFF.



When the amplifier is in BRIDGE mode, the speaker should be connected across the middle binding posts. The white LED marked BRIDGE will illuminate to indicate that the amplifier is configured as mono, and to remind the user that the speaker should be connected to the binding posts on its either side.

The input signal to the amplifier in BRIDGE mode can be either the LEFT or RIGHT channel of the selected input. The selection is accomplished with the BRIDGE SOURCE switch, located below the MODE switch, next to the XLR5 pass-through socket.

NOTE: When the Isis M75P is connected to an Isis M75D via the XLR5 socket and dedicated X5-Interlink cable, both channels coming out from the preamplifier output of the Isis M75D are available as a signal source. By default, the upstream Isis M75D uses the LEFT channel in bridged mode. Therefore, select RIGHT channel on the M75P as the source in bridge mode.

Please note that the minimum impedance in BRIDGE mode is 4 ohms.

Make sure that your loudspeakers can handle the output power of the amplifier in this mode. The Isis M75P will deliver up to 800 watts into a 4-ohm load. Loudspeakers with lower impedance may be used, however this may trip the overload protection and/or result in overheating if operated at high power output consistently.

Mode switch

Selects STEREO or BRIDGE mode. The mode switch is located on the rear panel next to the XLR5 input socket.

To use the M75P as a bridged mono amplifier, follow these steps:

1. Switch amplifier off.
2. Connect the loudspeaker to the middle binding posts observing correct polarity.
3. Move the MODE switch to BRIDGE position.
4. Select which channel will be providing the signal to the M75P – left or right. Any of the available inputs can be used to provide signal to the amplifier.
5. Switch on and verify that the red output status LED's are off.

Stereo mode

To use the Isis M75P in Stereo mode, set the MODE switch to “STEREO”. Connect loudspeakers to the respective binding posts. The positive line of the speaker cable should be connected to the RED binding post of each output. The minimum rated load is 4 ohms. If a lower impedance load is connected, it may trigger the short-circuit protection or cause overheating, resulting in intermittent output or no sound at the output. The red LED above the corresponding output will glow in case of a short circuit or low impedance current limiting, indicating that the respective channel is disabled.

STEREO operation in a multi-amp setup

The Isis M75P may be used as part of a parallel multi-amplifier setup. To connect several amplifiers in parallel, use the corresponding male socket for passing the signal downstream. The two sets of RCA connectors are hard wired in parallel, as are the XLR connectors.

Trigger operation

The Isis M75P accepts and provides trigger voltage for remote on/off. When a voltage (6V-20V) is present on the “Trigger IN” socket, the amplifier will switch on and will remain on until the voltage is present. It cannot be switched off from the POWER button while there is a voltage at the trigger input. The trigger input is an isolated floating sub-circuit to avoid ground loops. Input voltage polarity is irrelevant.

The trigger output can be used to switch other devices on/off by providing 12VDC voltage on the “Trigger OUT” socket when the Isis M75P ON. The tip is positive. The output current is limited to 100mA and is short-circuit protected.

Chassis grounding

The chassis of the M75P amplifier is internally grounded to the EARTH tab of the mains socket. A second connection to GROUND/EARTH is NOT required. Use the grounding post to connect other devices that may need grounding ONLY if they do not have an EARTH connection (i.e. if they are equipped with a 2-wire power cord), otherwise hum may result due to ground loops.

When an appliance with a 2-wire power cord is connected to the M75P and hum is heard, use an appropriate wire to connect the EARTH binding post to a metal part on its chassis that is connected to its signal ground.

Care and maintenance

The Isis M75P has no user-serviceable parts inside. It does not require any periodic maintenance or adjustments – the advanced circuits are self-adjusting and always operate in optimal mode. There are no replaceable fuses inside the chassis, or anywhere else. The chassis is completely sealed and protected from ingress of dust and water drops, however it is not watertight.

Cleaning the cabinet should be done with a feather duster. In case of fingerprints, use a lint-free cloth dampened with water and mild detergent. Do not use aggressive or abrasive cleaning agents. Finish off by wiping with a cloth dampened in clean water to remove any detergent residue.

WARNING: LETHAL VOLTAGES ARE PRESENT ON EXPOSED METAL PARTS INSIDE THE CABINET. OPENING THE CABINET IS AT THE PERSON'S OWN RISK. DO NOT OPEN THE CABINET WHILE THE AMPLIFIER IS CONNECTED TO THE MAINS. DO NOT OPERATE WITH THE TOP COVER OFF. ALLOW AT LEAST 10 MINUTES AFTER MAINS POWER HAS BEEN REMOVED FOR CAPACITORS IN THE POWER SUPPLY TO DISCHARGE BEFORE OPENING THE CABINET. VERIFY ABSENCE OF VOLTAGE BEFORE TOUCHING ANY PART. REFER SERVICING TO FACTORY-AUTHORISED PERSONS ONLY. ANY UNAUTHORISED REPAIR OR MODIFICATION VOIDS WARRANTY.

WARNING: DO NOT TOUCH THE LOUDSPEAKER BINDING POSTS OR LOUDSPEAKER TERMINALS WHILE THE AMPLIFIER IS OPERATING. DOING SO MAY CAUSE ELECTRIC SHOCK, PERSONAL INJURY OR PROPERTY DAMAGE, OR DEATH. KEEP CHILDREN AND PETS AT A SAFE DISTANCE.

Protection features

Short circuit protection

The power stages of the Isis M75P are protected against accidental short circuits. In the event of a short circuit in the presence of a signal the protection circuit will engage. A red status LED on the rear panel located above the binding posts of the affected channel and the LIMITER LED on the front panel will glow red to indicate that an output is disabled. The protection circuit will attempt to resume operation automatically every 2 seconds. *Do not operate the amplifier into a sustained short circuit as permanent damage may result.*

Over-temperature protection

The maximum operating temperature of the power stages is limited to 70°C. Upon reaching this temperature the respective power stage will be disabled. Operation will resume automatically when the temperature of the heatsink drops to approx. 55°C. Should this occur, ensure better air flow.

Low impedance loads

The minimum rated load is 4 ohms, however the Isis M75D will easily drive loads whose impedance occasionally dips down to 1.5 ohms. If the load impedance is consistently lower than 3 ohms over a significant band of the audio spectrum *and* the amplifier is driven at high power, this may cause overheating and temporary disruption of operation.

Low impedance or highly reactive loads may trip the short circuit protection, causing intermittent disruption of playback. The Limiter LED on the front panel will glow red while the output is disabled.

Clipping protection

Clipping occurs when an amplifier is overdriven, i.e. when the output signal attempts to go higher than the supply voltage. A clipped signal contains excessive distortion and can be very harmful to loudspeakers, especially tweeters, as it is equivalent to compression. A heavily clipped signal shifts the power output toward the top end of the audio spectrum, often leading to damaged tweeters.

A clipping monitor circuit in the Isis M75P is active at all times and will engage automatically when clipping level is reached. It acts as a volume control with fast engage and slow release times. The Limiter LED will glow white when maximum output volume has been reached. Further increase of the input signal level will have no effect on the output level.

Sustained overload protection

A low impedance load driven at maximum output power over an extended interval may lead to excessive power draw from the power supply. In such an unlikely case the amplifier will revert to the standby state to prevent damage to the power supply.

DC protection

The Isis M75P is a dc-coupled amplifier. There are no capacitors in the signal path. Should a DC voltage appear at any of the inputs the amplifier will attempt to amplify it. In such an event the DC protection will engage and will disable the respective channel. The LIMITER LED on the front panel will glow red continuously, as well as one or both status LED's on the rear panel, indicating which channel is at fault.

The DC protection is not self-resetting. Toggle the MAINS switch and wait at least 10 seconds before switching mains power on. Should the problem persist, disconnect the active source and repeat. If the problem persists without the source, contact your dealer for assistance.

If the source is producing DC voltage at its output, contact the party from whom it was purchased – it may have developed a defect or may need to have coupling capacitors installed to block DC output. Such capacitors may be inserted in the signal path without modification to the devices.

Technical specifications

Voltage gain, stereo / bridged mode	+26dB / +32dB (20x/40x)
Gain mismatch between channels	< 0.1 dB
Residual output noise	< 100 μ V
Input impedance	
RCA	10 kOhm
XLR3	20 kOhm
XLR5 direct input	5 kOhm
Input sensitivity	
XLR	2.25 Vrms
RCA 0/+8dB gain setting	2.25 / 0.75 Vrms
Distortion @ -1dB ref. rated power	
1kHz,.....	0.003 %
10kHz.....	0.03 %
Frequency response, +/- 0.5dB	5Hz – 50kHz
Full power bandwidth	5Hz – 30kHz

Output specifications

Stereo mode

Peak output voltage	
8ohm load, both channels driven with music	+/- 64Vpp
4ohm load, both channels driven with music	+/- 60Vpp
RMS power output	
8ohm, sine wave	2x 250W
4ohm, sine wave	2x 400W
Damping factor measured at binding posts, ref. 8 ohm	> 400

Bridged mode

Peak output voltage	
8ohm load, music	+/- 90Vpp
4ohm load, music	+/- 80Vpp
RMS power output	
8ohm, sine wave	1x 500W
4ohm, sine wave	1x 800W

Power consumption

Standby (Off)	< 1W
Idle (On)	20W
Operating ¹	typ. 20W - 100W, 1250W peak

Environmental

Operating ambient temperature, RH non-condensing.....	+10 to +35 °C
Storage temperature	-40 to +65 °C

Dimensions including handles and feet, mm	440 (w) x 440 (d) x 125 (h)
Net/Shipping Weight	21/29 kg

¹ The power consumption of an audio amplifier depends on the listening level, the load impedance and the music. As a general rule, power draw is approximately 150% of the actual output power, plus the power draw in the idle state. Average power output with music typically is 10%-15% of rated power, even when playing at full output. The provided peak value assumes worst-case conditions: a sustained sine wave at the rated power output into the minimum rated load. The Isis M75P is not designed to operate in this mode continuously.

Troubleshooting

POWER LED off, no operation	<ul style="list-style-type: none"> • Check MAINS switch on rear -> ON. Check line voltage. If LED does not glow within 30 seconds after applying mains voltage, seek assistance from your dealer. • Check VOLTAGE SELECTOR. If incorrect, remove mains plug and set to proper position. • Toggle mains switch to reset the circuit breaker.
POWER LED glows white, no sound	<ul style="list-style-type: none"> • Check INPUT selector switch -> move to the active input. • Check if source is providing signal. • Limiter LED glows RED -> Protection has been activated. Recycle mains power. • Check heatsink temperature. If hot, allow to cool. WARNING: HEATSINK MAY BE VERY HOT!
Sound is distorted	<ul style="list-style-type: none"> • Check speaker connections • Check signal cables • Inspect speakers for damage
Sound is lost intermittently or on transients	<ul style="list-style-type: none"> • Check load impedance >2 ohms (4 ohms in Bridged mode) • Check signal cables • Check speaker cables
Channels out of phase	<ul style="list-style-type: none"> • Check speaker connection polarity
Mains switch resets	<ul style="list-style-type: none"> • Check line voltage selector and set to the correct voltage • If correct voltage setting, seek assistance from an authorized representative or the factory

WARRANTY

Every effort has been made to assure that this product will perform as specified. This Analog Domain product has a limited warranty of five years for parts and labor on circuitry ONLY. Should this product fail to perform at any time during the warranty, Analog Domain will repair it at no cost to the owner, except as set forth in this warranty.

THE WARRANTY DOES NOT APPLY TO DAMAGE CAUSED BY ACTS OF GOD OR NATURE, NEGLIGENT USE OR MISUSE, IMPROPER CONNECTION OR CONNECTION TO ANY DEVICE OR SOURCE THAT MAY CAUSE DAMAGE, OR OPERATING OR STORAGE OF THE PRODUCT IN AN ENVIRONMENT OUTSIDE OF THE SPECIFIED RANGE, OR WHERE IT MAY BE SUBJECTED TO CORROSIVE SUBSTANCES.

The warranty on this page shall be in lieu of any other warranty, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. There are no warranties which exceed beyond those described in this document. If this product does not perform as warranted herein, the owner's sole remedy shall be repair. In no event will Analog Domain be liable for incidental or consequential damages arising from purchase, use, or inability to use this product, even if Analog Domain has been advised of the possibility of such damages.

IMPORTANT *The owner is responsible for notifying his or her Analog Domain dealer, distributor, or Analog Domain that a tube preamplifier will be used with the amplifier, so that its manufacturer, the dealer from whom the tube device was purchased, or the respective distributor can install coupling capacitors. If the owner does not notify the Analog Domain dealer, distributor, or Analog Domain and uses a tube preamplifier without coupling capacitors engaged, Analog Domain reserves the right to refuse warranty related service due to DC-related damage.*

Proof of purchase in the form of a bill of sale or receipted invoice substantiating that the unit is within the warranty period must be presented to obtain warranty service. The warranty begins on the date of the original retail purchase, as noted on the bill of sale or receipted invoice from an authorized Analog Domain dealer or distributor. Previously owned equipment, when re-purchased from an authorized Analog Domain dealer or distributor, has the balance of the original warranty, based on the original date of manufacture.

The warranty for Analog Domain products is valid only in the country to which they were originally shipped, through the authorized Analog Domain distributor for that country, and at the factory. There may be restrictions on or changes to Analog Domain's warranty because of regulations within a specific country. Please check with your distributor for a complete understanding of the warranty in your country.

If a unit is serviced by a distributor who did not import the unit, there may be a charge for service, even if the product is within the warranty period. Freight and any other charges to ship the unit to and back from the factory to you are your responsibility. Analog Domain is not responsible for any damage incurred in transit. Analog Domain will file claims for damages as necessary for units damaged in transit to the factory. You are responsible for filing claims for shipping damages during the return shipment.

Analog Domain does not supply replacement parts and/or products to the owner of the unit. Replacement parts and/or products will be furnished only to the distributor performing service on this unit on an exchange basis only; any parts and/or products returned to Analog Domain for exchange become the property of Analog Domain.

NO EXPRESSED OR IMPLIED WARRANTY IS MADE FOR ANY ANALOG DOMAIN PRODUCT DAMAGED BY ACCIDENT, ABUSE, MISUSE, NATURAL OR PERSONAL DISASTER, OR UNAUTHORIZED MODIFICATION. ANY DISASSEMBLY, COMPONENT REPLACEMENT, PERFORATION OF CHASSIS, UPDATES, OR MODIFICATIONS PERFORMED TO THE UNIT BY UNAUTHORIZED PERSONS WILL VOID THE WARRANTY. In the event that Analog Domain receives a product for warranty service that has been modified in any way without Analog Domains' authorization, all warranties on that product will be void. The product will be returned to original factory layout specifications at the owner's expense before it is repaired. All repairs required after the product has been returned to original factory specifications will be charged to the customer, at current parts and labor rates. All operational features, functions, and specifications and policies are subject to change without notification.