

# Angel 6 User Manual

Congratulations on your purchase of the Angel 6 power amplifier. It has been designed and manufactured to provide many years of trouble-free musical enjoyment. To get the best out of your amplifier, please read this manual carefully and take into account the guidance on positioning, airflow and cabling.

If you are in any doubt about how to connect your hi-fi components together or install your system, please contact your hi-fi dealer who supplied the amplifier for assistance.

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# 1 Before you Start

## 1.1 Heavy lifting

The Angle 6 amplifier is solidly built with heavy internal components in order to produce the best sound quality. As a result it weighs nearly 30kg, so care needs to be taken when lifting or moving the amplifier. We recommend you treat it as a 2 person lift instead of trying to lift it on your own.

Follow all the normal lifting advice, e.g. using leg power instead of bending your back. Take into account your physical condition and your level of experience of lifting heavy items.

The amplifier can be safely lifted using 2 different lift positions:

1. Front and back. Using the handle on the back of the amplifier and lifting under the front panel. The amplifier is fairly symmetrical inside so this has even weight distribution side to side, and slightly more weight on the handle.
2. Both sides. With 2 people it's often easier to lift from each side under the large heatsinks. The heatsinks have curved corners, so this is quite a comfortable and stable lift, and the heatsinks are very solidly attached to the chassis.

Never attempt to lift the amplifier using the connectors or any attached cables.

## 1.2 Short Circuits

Be careful at all times to avoid short circuits around the large WBT gold coloured speaker connectors on the back of the amplifier.

The amplifier is capable of delivering very high currents in order to control the speakers. While the amplifier has protection circuits to reduce the risk of amplifier damage in a short circuit situation, the very high energy transients during a short circuit can cause damage to your loudspeaker drive units.

We strongly recommend switching off the Angel 6 and waiting for 30 seconds before moving the amplifier or any other hi-fi components, or before moving or adjusting any cables in the whole installation.

Avoid dropping any metallic objects down the back of the amplifier – again you should turn off the amplifier and wait 30 seconds before using tools, or moving any cables, behind the amplifier or rack system.

## **2 Installation Recommendations**

### **2.1 Position in the listening room**

The Angel amplifiers have been designed with very low output impedance and a high current delivery. In order to get the best benefits from this, we recommend keeping the speaker cable lengths as short as it reasonably practical, in keeping with domestic compatibility.

If you are able to place the power amplifier near to the loudspeakers and keep the speaker cable length to only a metre or two, this will reward you with better timing, rhythm and bass agility.

### **2.2 Locating the Amplifier**

The amplifier must have clear air space on all sides to ensure good airflow and avoid overheating. The amplifier must be mounted on a flat, hard surface to ensure good airflow to the underside of the heatsinks. There must be nothing touching the amplifier sides (the finned heatsinks), and nothing resting on top of the amplifier. The amplifier should not be close to a heat source such as a radiator or heater

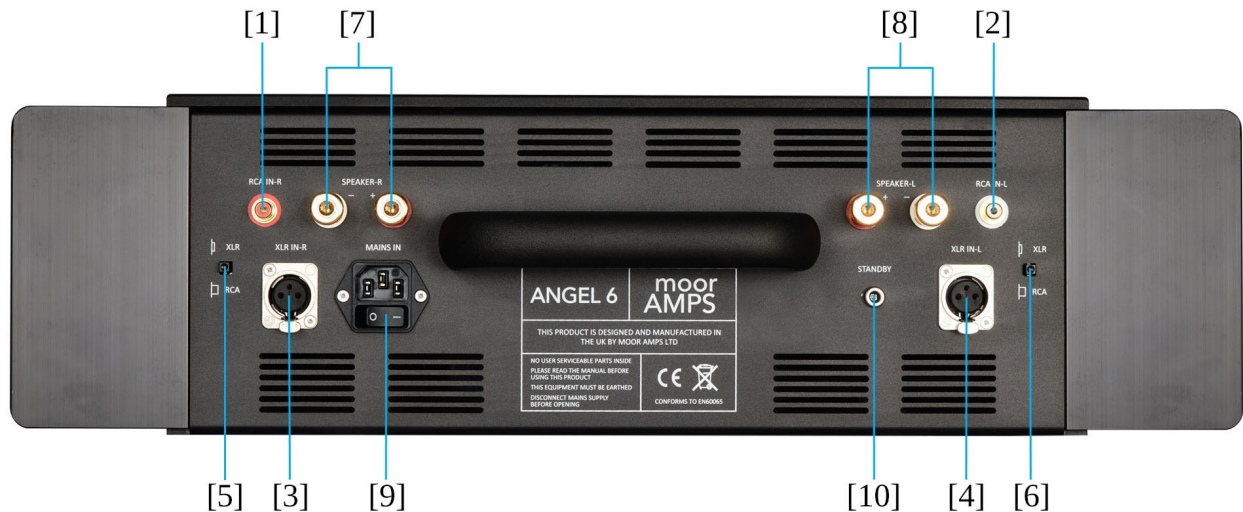
If the amplifier is in a rack system with shelving, the shelf above the amplifier must be at least 20mm above the top of the amplifier.

In a cabinet with solid sides, or if the amplifier is placed near a solid vertical surface (e.g wall, cabinet side etc), then you must ensure a clear gap to the side of the amplifier of at least 50mm between the heatsink and the nearest vertical surface.

Any rack system or enclosure for the Angel 6 must have an open back and front to allow airflow circulation to-and-from the room. You must not use the amplifier in an enclosed cabinet.

If the amplifier is given restricted airflow, and is unable to dissipate enough heat, there is internal circuitry to shut down the Angel 6 when the temperature gets too high, but this is a safety feature, and is NOT a substitute for good ventilation!

### 3 Connections



Number	Name	Description
[1]	RCA Input - Right	Right hand channel RCA (Phono) input
[2]	RCA Input - Left	Left hand channel RCA (Phono) input
[3]	XLR Input - Right	Right hand channel XLR (Balanced) input
[4]	XLR Input - Left	Left hand channel XLR (Balanced) input
[5]	Input switch - Right	Right hand channel input selector switch OUT = RCA    IN = XLR
[6]	Input switch - Left	Left hand channel input selector switch OUT = RCA    IN = XLR
[7]	Speaker - Right	WBT Speaker Connectors for Right hand channel RED = +ve    WHITE = -ve
[8]	Speaker - Left	WBT Speaker Connectors for Right hand channel RED = +ve    WHITE = -ve
[9]	Mains inlet	Switched IEC mains inlet The switch turns off mains power to the amplifier
[10]	Standby input	Standby Jack socket Driven by the Angel-Pre to put the power amp in standby

NOTE: When viewed from behind the amplifier, the left hand channel inputs and outputs appear to be on the right side, and vice versa. It all makes sense when you imagine this viewed from the FRONT of the amplifier.

### 3.1 Which Input to choose?

You may need to experiment to find what works best to complement your system, in your room, and for your preferred musical presentation.

We have listened to both input types with our own Angel-Pre and with some other manufacturer's pre-amps, and with a small selection of different manufacturer's cables. Here are our thoughts (feel free to disagree!):

For short connections (up to around 5m) using a good quality hifi interconnect, the RCA input is often a fraction better sounding than the XLR input.

For longer connections, we find the XLR tends to keep a very similar sound transparency as the cable length increases, where the RCA cables tend to take on an additional sound signature which becomes more pronounced as the length increases.

At this point, re-read the first paragraph of this section – and if you like the sound of a particular cable in your system – use it, and enjoy the music!

### 3.2 Input Switch Selection

Once you've chosen RCA or XLR input connections for your system, you need to set the Angel 6 to use the correct input. On the back panel below the RCA input on each side, you will find the two switches for the input selection.

The inside of the amplifier is fully 'dual mono', so each mono amplifier has its own selector switch to avoid any cross-talk between the left and right channels.

Each switch is selecting the appropriate RCA connector when it is 'out', and selecting the XLR balanced input when it's clicked 'in'.

NOTE: While you are auditioning RCA versus XLR cables to see which you prefer, you can have both cables plugged in from the pre-amp and use the switches to quickly swap between the input cables for your listening tests. You now have 2 different earth paths for each side of the amplifier back to the pre-amp, so you may get some faint buzz from a pair of earth loops!

Just make sure that once you've finished the test and chosen your preferred cable, you unplug the cables you don't want to use.

## 4 Speaker wiring

This is a widely debated hi-fi subject, with a plethora of widely differing opinions and expert conclusions. But we're prepared to dip a toe in the water and present a few opinions from our own experience.

Make sure to have clean terminations with no stray copper strands to potentially short out to a nearby terminal. In all cases we suggest that you use the provided black and red sleeving over the exposed gold outer portion of the WBT speaker connectors, just in case something metallic falls behind the amplifier.

We use high quality WBT speaker connectors, because they give several options for a very low resistance connection to the speaker cable. Let's look at them:

### 4.1 4mm plugs

You can put a 4mm plug (they have many names including 'banana plugs') straight into the end of the WBT connector. This is a quick and convenient connection, and it can deliver very good results.

If you are using 4mm plugs, put the supplied red and black sleeving over the WBT connectors before you plug in the speaker plugs. Make sure you use the RED colour sleeve on the RED (+) WBT terminal.

### 4.2 6-8mm Spades

The WBT connector is designed to give high pressure clamping on a 6-8mm spade connector. This can give a lower, more consistent resistance than the 4mm plug option. It's still reasonably convenient.

If you are using Spade connectors, make the connections first, then put the supplied red and black sleeving over the WBT connectors.

### 4.3 Bare Wires

We arrive at the least convenient of all, but our personal favourite! You put the bared, unsoldered wire ends (stripped back about 15mm) into the clamping hole of the WBT connector. The WBT connector design clamps them for a very low resistance connection.

Unlike the plug or spade options, there is no second connection interface. If you're installing the amplifier once and leaving it in place, the improved connection quality may be worth a one-off inconvenience.

If you are using bare wires make the connections first, then put the supplied red and black sleeving over the WBT connectors.

## **5 Standby operation**

Your Angel 6 amplifier has been designed to reach optimum operating conditions within a few seconds of power-on. Unlike many power amplifiers it does not need to be switched on a long time before you want to listen to music.

For added convenience the amplifier has a low power standby mode. This is designed to be driven by the Angel-Pre in order to put the power amplifier into standby.

The standby input on the rear panel of the amplifier uses a 2.5mm power jack connector, and if nothing is connected to this standby input, the amplifier will operate in normal running mode as long as the mains is switched on.

### **5.1 Using Standby with the Angel-Pre pre-amp**

When you put the Angel-Pre into standby (by front panel switch or remote), the Angel 6 will shut down 5 seconds later and go to standby mode. In this mode it consumes less than 0.5W of power. When the Angel-Pre comes out of standby, after 5 seconds the Angel 6 will power up to running mode.

#### **5.1.1 Standby Cable**

The Angel-Pre is supplied with a 1m standby cable as standard. If you want a different length just ask your dealer and we will provide a replacement standby cable for your system. It is fine to use a cable which is too long, and just coil up the excess and secure it with a cable tie or similar.

### **5.2 Using Standby without the Angel-Pre**

If you provide a DC voltage between 4 and 20VDC on the standby jack input, with the centre pin positive, then the Angel 6 will go into standby after 5 seconds. The input is protected against reverse polarity of up to 20VDC - but the standby will not work if the wires are reversed.

The input resistance on the standby jack is  $> 2.7\text{kohms}$ , so the current at the maximum 20V input will be less than 8mA.

## 6 Repeated Power or Standby cycles

The Angel 6 uses a soft-start system due to the very large capacitors fitted to the power supply. The soft start circuit needs to cool down between power cycles in order to work correctly.

To make sure that the soft-start circuit does not overheat, the Angel 6 counts the time between power cycles. If the power is turned off, the counter is stored in non-volatile memory so that when you next switch on the amplifier, it continues counting where it left off previously.

A Power or Standby cycle is caused by:

- Turning the mains on at the mains supply, OR
- Turning the mains on with the amplifier mains switch, OR
- Putting the power amplifier into and out of standby using the Angel-Pre and standby cable

The Angel 6 will allow two power cycles from 'cold' initially, followed by one power cycle every 3 minutes. If you try to do more power cycles within the timer count down, the amplifier will not start up immediately, but will give one red flash every 2 seconds from the logo display until the counter finishes counting the 3 minutes.

You should leave the amplifier switched on and showing the Power Cycle Error flash. When the counter finishes, the amplifier will switch on and the display will go back to steady blue.

**Note: The Angel 6 can only count down the time when it is switched ON. If you switch off the Angel 6 while it is counting and showing the Power Cycle Error, next time you switch the amplifier on it will show the Power Cycle Error and resume the countdown. This is still true if you next switch it on days, weeks or even years later!**

## 7 Logo Display brightness

If you are using the Angel 6 with the Angel-Pre preamp and the standby cable, then selecting subdued lighting on the Angel-Pre (refer to the Angel-Pre User Manual) will signal the Angel 6 to use subdued Logo lighting.



## 8 Logo Display warnings

The Angel 6 display normally has blue illumination, but under certain conditions it can illuminate red (reddish/purple – we’ll call it red) to signal warning or fault conditions.

### 8.1 Output limit Warning

The Angel 6 is capable of driving high sound levels without the characteristic ‘hardening up’ of the sound you get from most amplifiers. This means it could reach clipping levels without much audible warning.

The amplifier monitors the output voltage and current levels, and if you are approaching the maximum power levels, the display will briefly flash red in time with the biggest musical peaks.

This happens when the RMS power reaches approximately 250W (4ohms) per channel, and it’s a useful warning to stop winding up the volume control. You will not damage the amplifier by choosing to go beyond this level, but you certainly risk damage to the speaker drive units if the amplifier is driven into clipping or current limiting.

### 8.2 Error conditions

The Angel 6 monitors a number of potential error conditions and will shut down when these occur in order to avoid damage.

When these error conditions cause a shutdown, the main amplifier supply is disconnected and only the standby controller continues to run. It signals the type of error code using the red illumination of the logo, either a constant red, or a series of red flashes over the blue background colour.

A flash series is 1 or more short flashes ( $\frac{1}{4}$  second) with short pauses ( $\frac{1}{4}$  second), then a long pause (2 seconds) between each series of flashes.

Error Condition	Number of Flashes	Recovery
Overload	Constant Red	Power cycle
Power Cycle Error	1 flash	Auto – after 3 minute countdown
Under temperature	2 flashes	Auto – when temperature rises
Over temperature	3 flashes	Auto – when temperature falls
Voltage error	4 flashes	Auto – after a delay

#### 8.2.1 Overload Error

In the event that the amplifier detects overload or short circuit on the amplifier output, it will shut down and the display will be permanently red. This is potentially damaging to speakers so the amplifier will remain in shut-down state until you switch off the mains power. You need to wait for

at least 10 seconds before you re-apply power in order to cancel the error condition, but this warning should not be ignored.

When you see the overload error, you should leave the mains switched off, and check the speaker cables (including amplifier and speaker connections) for any problem which could be causing the overload condition – e.g. stray wire strands, loose connections or anything metal on the connections etc.

### **8.2.2 Power Cycle Error**

See the section ‘Repeated Power or Standby Cycles’ above.

### **8.2.3 Under Temperature Error**

If the amplifier senses a temperature of less than 5 degrees Celsius during start-up, it will not start the high voltage amplifier power supply. The reason for this error should normally be obvious – for example transported on a cold day, or used in a very cold room.

To recover from this error, the amplifier needs to be in an ambient temperature above 5 degrees, and to be allowed some time to warm up. It will automatically start up once the internal temperature has risen above 5 degrees Celsius.

### **8.2.4 Over Temperature Error**

If the amplifier senses a temperature of more than 55 degrees Celsius during operation, it will shut down the main power supply to avoid damage to the amplifier components. You may hear the output become distorted and then go quiet.

This error can occur after listening for some time at very high power levels with low impedance speakers, but most likely it will occur if there is obstructed airflow to the back or sides of the amplifier – see the section ‘Positioning the Amplifier’ above.

When the amplifier cools down a few degrees, it will automatically restart.

### **8.2.5 Voltage Error**

If the amplifier senses incorrect power supply voltages, or output voltage which could indicate an internal fault, it will shut down. This can occur if there is a severe mains drop-out, and the amplifier will restart after a short delay.

If this error condition persists, stop using the amplifier and contact your dealer to have the amplifier checked.

## 9 Warranty

Moor Amps products are covered by a five (5) year parts and labour limited warranty, in addition to your statutory rights under UK law.

If a Moor Amps product is used in a normal domestic environment and becomes defective due to faulty materials or workmanship, you will qualify for this warranty, subject to the exclusions listed below. You should contact your dealer where you purchased the product, and if necessary return the product to them. You will have to pay any shipping charges incurred in returning the product to the dealer.

Moor Amps will at its discretion repair or replace the defective product within a reasonable time of receiving the product.

If the product qualifies for this warranty, and the damage is not subject to the exclusions below, you will not be charged for the repair or replacement under this warranty, and Moor Amps will pay for return shipment of the product to your dealer, or to your address in the UK (at your choice).

### 9.1 Warranty Exclusions

This warranty does NOT cover:

- Damage to the product not caused by defective materials or workmanship
- Damage resulting from any repairs or modifications not carried out by Moor Amps or a repairer nominated by Moor Amps
- Damage resulting from abnormal use
- Damage resulting from failure to follow the installation instructions
- Damage sustained during shipment of the product
- Damage resulting from Accident, Acts of Nature or Abuse