

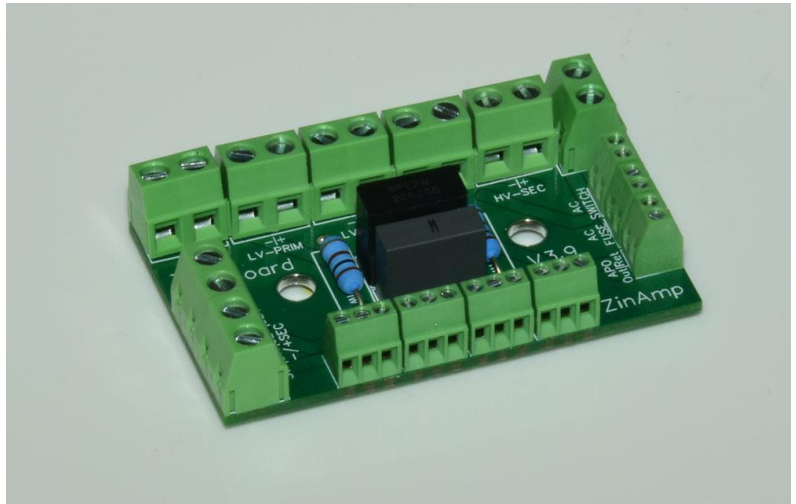
**Application & Purpose:**

Connects AC Mains Supply to Transformers and Transformers to Power Supplies.

Simplifies the job of connecting transformers, fuses and switches safely.

Soft start option - requires AC relay and two thermistors

Allows wiring for 100-120v AC and 220-240v AC supplies.



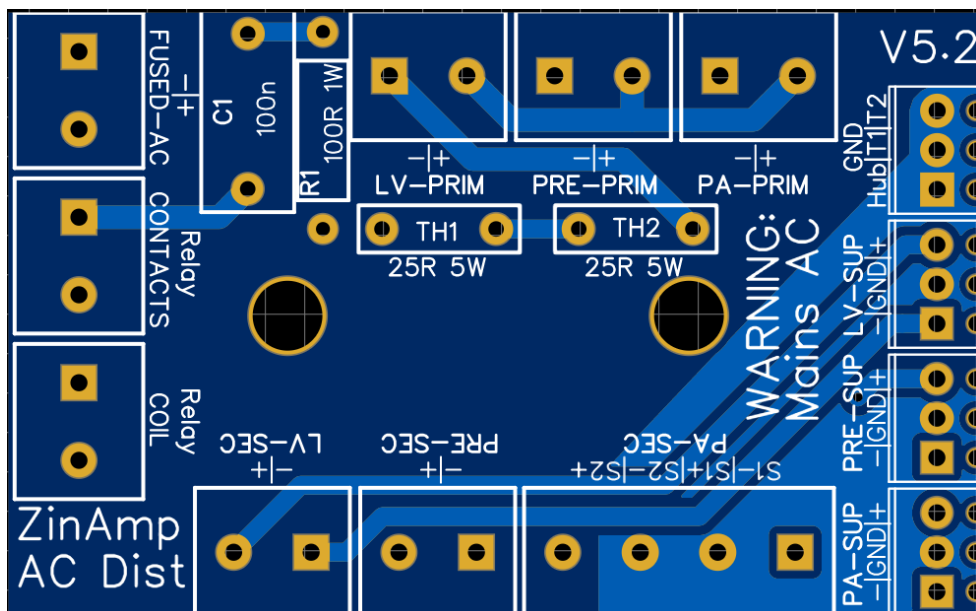
**Specification:**

<b>Purpose</b>	- AC Supply switching and fusing - Hub for connecting AC transformers to DC power supplies
<b>Features</b>	- 2oz copper tracks to handle mains current - Snubbers for switched AC circuits

**Details:**

A simple and clearly marked 'organiser' board for AC in and AC out; with AC switch-snubbing and fusing, as well as a soft-start option.

**Bare PCB:**



**Overview:**

This PCB can accommodate three transformers.

Transformer Name	Purpose	Detail
PA	Main Power Amp transformer	When using a split rail power amp, the 0v of the secondary windings (centre-tap) of this transformer must be grounded using S1+ and/or S2- terminals
LV	Low Voltage Transformer. Typically used for valve/tube filament heating supply and timer control.	Can be used for any voltage of transformer in a custom installation
HV	High Voltage transformer. Typically used for high tension supply on valve/tube amps.	Can be used for any voltage of transformer in a custom installation

**Transformer Connections:**

Primary	Secondary	Output	Notes
PA-PRIM	PA-SEC	PA-SUP	Switchable using APO terminals
LV-PRIM	LV-SEC	LV-SUP	For a custom split-rail supply, join the 0v terminals of the secondary windings (centre-tap) and ground them at T1 or T2.
HV-PRIM	HV-SEC	HV-SUP	For a custom split-rail supply, join the 0v terminals of the secondary windings (centre-tap) and ground them at T1 or T2.

**Live AC Connections:**

Terminal	Use	Notes
Fused AC	- + AC mains supply (fused)	Must come via a 3A slow-blow fuse and a double pole switch that isolates both live and neutral poles of the mains.
Relay CONTACTS	Soft-start relay	If using an AC relay for soft-start, the relay contacts (not the coil) connect to these terminals, either way around
Relay COIL	Soft-start relay	If using an AC relay for soft-start, the relay coil (not the contacts) connect to these terminals, either way around

## Transformers with Electrostatic Screens

If your transformer has an electrostatic screen, the screen can be grounded at the T1 or T2 terminals. If these are in use, connect the screen to one of the terminals on the Earth Hub marked 'Spare'. Failing that, you can ground the screen on the metal chassis.

### Earth Hub:

Connect the ground terminal to the **Earth Hub** as indicated on the PCB and the Earth hub to the AC earth and chassis. AC earth must always be connected via the Earth Hub. Chassis must always be connected to the AC earth (ALWAYS)!

Do not connect the ground terminals of the AC distribution to the AC supply earth or you may experience audible hum.



### Soft Start:

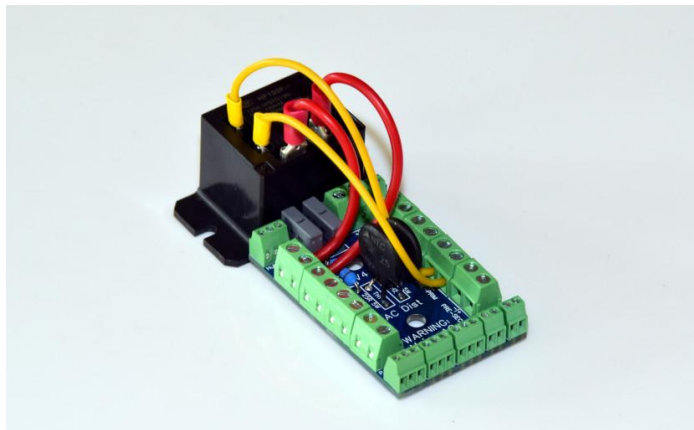
When using a transformer 300VA or larger, it is prudent to add a soft-start to protect the on/off switch and mitigate inrush current to the transformers' primary windings. This is very simple to connect and requires two NTC Thermistors and a mains AC relay.

Holes for the NTC Thermistors are at the center of the board and are marked on the reverse-side. The thermistors can be soldered on top or underneath, depending on your space constraints.

The relay coil is connected to the "LV-PRIM" terminals and the relay contacts to the "Relay CONTACTS" terminal.

The thermistors temporarily limit the inrush-current to the transformer at the point of switch on, after which the relay closes and normal current flows. This takes between 100 and 250ms.

<b>Optional components for Soft-start. If NOT using Soft-start, the "Relay CONTACTS" terminals must be jumpered with a wire-link, otherwise the AC supply will be isolated.</b>	
<b>Mains AC Relay:</b>	<b>NTC Thermistors:</b>
Hongfa HF105F-4/240A1HSTF - 240v coil or Hongfa HF105F-4/120A1HSTF - 120v coil  Note: Use 240v or 120v coil version, depending on your local AC supply voltage	TDK B57238S0250M000  25 ohm 3.9W  Ensure thermistors are NTC type (Negative Temperature Coefficient)
	



## 220v and 120V Wiring

The AC Distribution module allows wiring for 100-120v AC (US, Canada, Japan) and 220-240v AC (UK, Europe, Australia)

- Single Primary Transformers - wire these normally as indicated on the board. The primary windings should be rated for the local voltage.
- Split Primary Transformers - these are usually rated at 115v AC for each primary winding. For local voltage of 100-120v AC, wire the primaries in parallel. Where local voltage is 220-240 AC, wire the primaries in series.

**Note:** When wiring split-primaries in series, you will need to solder or clamp the + of the first primary and the - of the second primary together, then protect this solder-joint with heat-shrink insulation. Insert the other - and + primaries in the appropriate terminals of the AC Distribution as indicated on the PCB.

### Parts List:

CONNECTORS: Both blank and ready-built PCB requires connectors be purchased and soldered on by the constructor. Terminal block connectors are shown in the list below. For safety, these must be used and not swapped for PCB headers, as with other ZinAmp modules.

Designator	Value/Spec	Quantity	Supplier	Manufacturer	Manufacturer Part	Supplier Part
C2	220n	1	RS	Panasonic	ECWFE2W224J	105-1073
R2,R1	100R 1W	2	RS	TE Connectivity	ROX1SJ100R	125-1174
C1	100n	1	RS	Kemet	R46KF310040P1M	<a href="#">126-2250</a>
HV-PRIM,LV-SEC, LV-PRIM,-/+PRIM ,AC,HV-SEC	2 Pole Terminal - Mains	6	RS	RS-PRO	146-8345	146-8345
-/+SEC	4 Pole Terminal - Mains	1	RS	RS-PRO	146-8347	146-8347
SWITCH,FUSE,AP O	2 Pole Terminal	3	RS	RS-PRO	790-1098	790-1098
SWITCH,FUSE,AP	3 Pole Terminal	4	RS	RS-PRO	790-1092	790-1092

O, LV-SUP						
NTC Thermistors	25 ohms 3.9W	2	RS	TDK	B57238S0250M000	185-7827
AC Relay	120v or 240v coil, depending on local AC supply	1		Hongfa	HF105F-4/120A1HSTF or HF105F-4/240A1HSTF	121-8072 or 121-8073

Parts available from [RS Online](#). Also try [Farnell](#), [Mouser](#) and other online suppliers.

Parts from different manufacturers can be substituted where spec is sufficient

Supplier trading names may differ by country.