

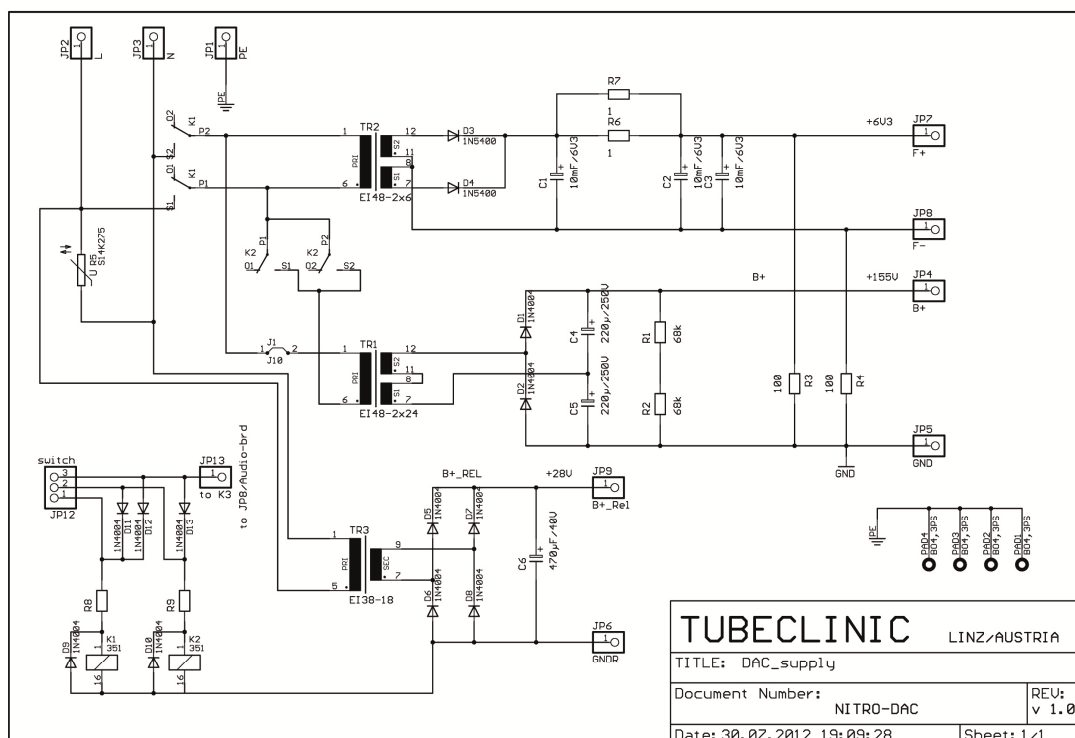
NITRO

The Supply PCB

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*"Any Audio circuitry will only perform as good as its supply ..."
That's right, so I designed a smart but easy to build supply unit.*

Have a look at the schematic:



Contrary to most other designs, there are three transformers instead of one. Special "tube-supply transformers" including anode, heater and control-circuit windings in one piece are hard to get these days. So I took three easy to get and cheap PCB-transformers to fix that problem.

T1 (10VA; 2 x 24V) is needed for the plate supply voltage, which is a simple voltage-doublers with accompanied smoothing circuit.

T2 (10VA; 2 x 6V) feeds the heaters via a common full-wave rectifier and smoothing circuit.

T3 (3,2VA; 18V) gives the control voltage for the three relays as well as for the duo-LED.

Mains voltage is applied via points JP1 [PE], JP2 [L] and JP3 [N]. Prior to these connection points at the PCB, a fuse (1A slow blow) and an EMI-filter are installed within the housing. On the PCB a Metal Oxide Varistor (MOV) is placed additionally, (please see schematic diagram of completed unit).

If you do not use a mains voltage of 230V/50Hz, you had to purchase other transformers than shown (with primary voltage fitting your mains situation) and change the limiting voltage of the MOV ($U_n + 20\%$) accordingly. In addition, mains fuse has to be adapted.

For example: Mains 110V/60Hz -> F1 = 2A; MOV = S14K175; all transformers 110V/60Hz.

Relays K1, K2 and K3 (situated at the AudioPart PCB) are switched by the external rotary switch S1 accordingly to steps:

Step	OFF	STANDBY	MUTE	PLAY
Function	Heaters off, plate supply off, muting on	Heaters on, plate supply off, muting on	Heaters on, plate supply on, muting on	Heaters on, plate supply on, muting off
K1	0	1	1	1
K2	0	0	1	1
K3 (Situated at AudioPart PCB)	0	0	0	1

Under normal operating conditions (loaded) and if the intended transformers are in use, the output voltages of the three supply voltages should read:

Heater supply (F+/F-) 6,2 ... 6,5VDC at 0,8ADC

Plate supply (B+/GND) 150 ... 160VDC at 25mADC

Control voltage (B+_Rel/GNDR) 27 ... 29VDC at 25mADC

There is no serial regulation, so the output impedances of the supplies will be low. There will also be no interference between the different supplies because each of them uses their own transformer.

You can download PDFs of schematic, copper picture (1:1) and parts-placement from my website.

Size of the supply PCB is 100 x 160 mm, single-sided (Euro-card format).