

Essential Mains Changeover

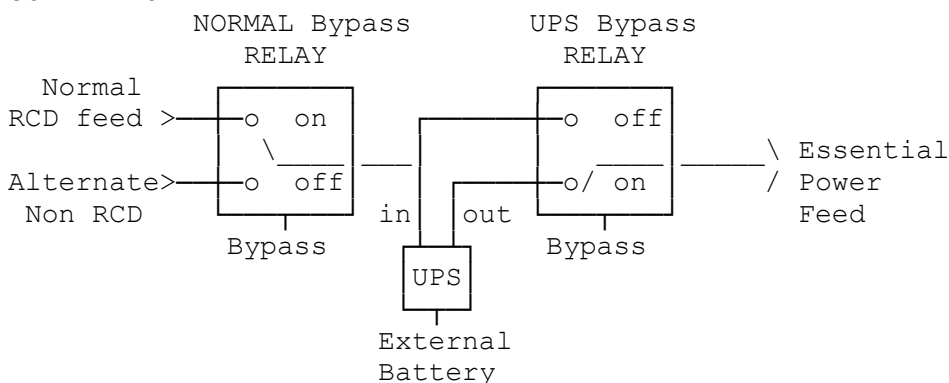
By G8MNY

(Updated Sep 13)

(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

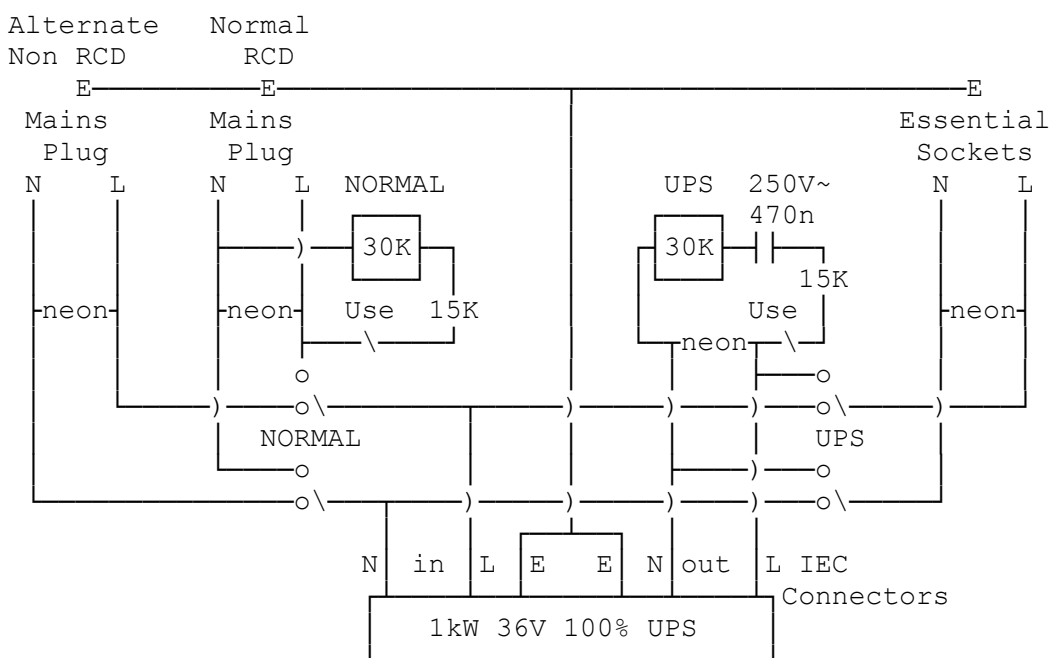
I designed this simple unit to bypass 230V mains problems at a local community radio station, that needs essential mains for 24/7 computers. The building's Mains Consumer Unit had been updated with two Earth leakage Residule Current Devices, feeding 2 Main Contact Breakers banks, but also with a separate "Alternate Non RCD feed" provided just to the UPS system.

SCHEMATIC



CIRCUIT

For maximum flexibility, the source load plugs & sockets, are all Standard UK 13A fused type on the mains source box. But studio distribution is only to separately fused EIC banks units.



The four neons indicate power status, & the two switches enable safe manual override of the relays for Normal Mains circuit & UPS servicing etc.

I found good quality 3x 15A changeover AC relays with 30kΩ coils, but they held operated down to 140V! So added series 15kΩ 1W resistor to obtain a better operate to fail voltages of 205V to 190V.

PROBLEM

However on flattening the UPS battery, I discovered the UPS can put out 300V DC blowing kit fuses (SMPSUs PCs OK, Transformer kit not!). So I add a series 250V AC Cap to the UPS bypass relay to ensure the UPS gets bypassed if it does a mains wobbly again!

WARNING

Bypassing RCDs is not to be taken lightly! The station need for 24/7 essential power is considered very important. Normal building mains is all RCD protected, only the specialised kit on IEC distribution panels have the bypass capability. And this can be easily be configured back to RCD only, for safer live mains while wiring work is going on etc. you just unplugging the non RCD supply, put in an a temporary RCD adapter (N.B. Most Adapters DO NOT STAY ON on a mains fail!) to be fully safe again.

See my Tech buls on:- "APC Smart 900 UPS", "DURITC 1kW 230V Inverter/UPS", "META HF Millennium 810H UPS", "Constant Voltage Transformers", "Variacs", "70-260V Mains Auto Transformer", "Maplin Mains Meter 2000MU-UK", "Mains Power Protection", "Mains Peak/RMS/Mean Meter", "Voltage Dependent Resistors", & "Portable Appliance Testing"

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73 De John, G8MNY @ GB7CIP