

Introduction

The UN9/35 battery switching unit is designed to be used with the PS2/163 power supplier. It provides fully automatic change-over to battery operation in the event of mains failure. As the mains voltage falls, a change-over to battery operation is affected progressively, until at 160 V r.m.s. there is complete battery operation. A battery supply voltage of ± 24 V, centre tapped, is required.

The unit is not suitable as a general purpose regulator due to its high a.c. output impedance.

Front panel mounted l.e.d's, marked + and -, show the state of the input positive and negative battery supplies. An additional orange l.e.d, BATTERY CURRENT, indicates that a current in excess of 30 mA is being drawn from the unit output.

The UN9/35 is mounted in a 2U (88.90 mm) high BBC binary metric modular chassis type CH1/65A and can be mounted in panels PN3/60 or PN3/61.

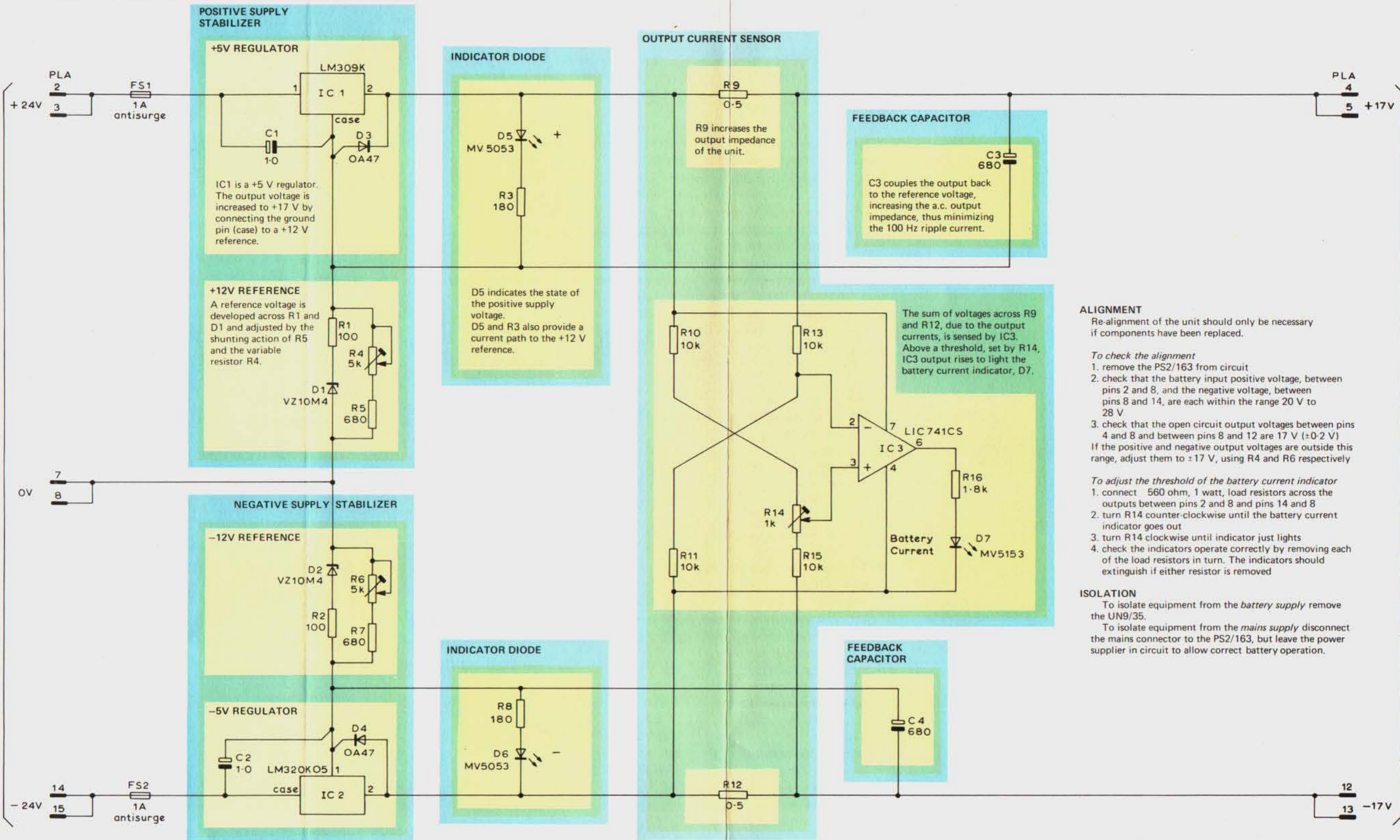
General Performance

Battery supply voltage	± 20 V to ± 28 V
Output voltage	
no load	± 17 V
maximum output current	± 16.5 V
Output current	
maximum	850 mA
battery current	
indicator threshold	30 mA

Performance when used with PS2/163

Mains voltage for battery current of 30 mA	
output current 800 mA	210 V r.m.s.
output current 400 mA	195 V r.m.s.
Mains voltage for complete battery operation	160 V r.m.s.
100 Hz ripple current from battery (during periods of reduced mains voltage)	12 mA r.m.s.
Chassis	CH1/65A
Indexing positions	1, 5, 15
Mounting frames	PN3/60 or PN3/61

(the coding bar assembly must be modified to suit the particular mounting frame by moving one of the coding pins)



POSITIVE SUPPLY STABILIZER

+5V REGULATOR

LM309K
IC 1

C1 1.0
D3 OA47
case

IC1 is a +5 V regulator. The output voltage is increased to +17 V by connecting the ground pin (case) to a +12 V reference.

+12V REFERENCE

A reference voltage is developed across R1 and D1 and adjusted by the shunting action of R5 and the variable resistor R4.

R1 100
R4 5k
R5 680
D1 VZ10M4

INDICATOR DIODE

D5 MV 5053
R3 180

D5 indicates the state of the positive supply voltage. D5 and R3 also provide a current path to the +12 V reference.

OUTPUT CURRENT SENSOR

R9 0.5

R9 increases the output impedance of the unit.

FEEDBACK CAPACITOR

C3 680

C3 couples the output back to the reference voltage, increasing the a.c. output impedance, thus minimizing the 100 Hz ripple current.

INDICATOR DIODE

D6 MV5053
R8 180

FEEDBACK CAPACITOR

C4 680

ALIGNMENT

Re-alignment of the unit should only be necessary if components have been replaced.

To check the alignment

- remove the PS2/163 from circuit
- check that the battery input positive voltage, between pins 2 and 8, and the negative voltage, between pins 8 and 14, are each within the range 20 V to 28 V
- check that the open circuit output voltages between pins 4 and 8 and between pins 8 and 12 are 17 V (± 0.2 V)

If the positive and negative output voltages are outside this range, adjust them to ± 17 V, using R4 and R6 respectively

To adjust the threshold of the battery current indicator

- connect 560 ohm, 1 watt, load resistors across the outputs between pins 2 and 8 and pins 14 and 8
- turn R14 counter-clockwise until the battery current indicator goes out
- turn R14 clockwise until indicator just lights
- check the indicators operate correctly by removing each of the load resistors in turn. The indicators should extinguish if either resistor is removed

ISOLATION

To isolate equipment from the *battery supply* remove the UN9/35.

To isolate equipment from the *mains supply* disconnect the mains connector to the PS2/163, but leave the power supplier in circuit to allow correct battery operation.

The sum of voltages across R9 and R12, due to the output currents, is sensed by IC3. Above a threshold, set by R14, IC3 output rises to light the battery current indicator, D7.

R10 10k
R11 10k
R12 0.5
R13 10k
R14 1k
R15 10k
R16 1.8k

LIC741CS
IC 3

Battery Current
D7 MV5153

NEGATIVE SUPPLY STABILIZER

-12V REFERENCE

VZ10M4
D2
R6 5k
R7 680
R2 100

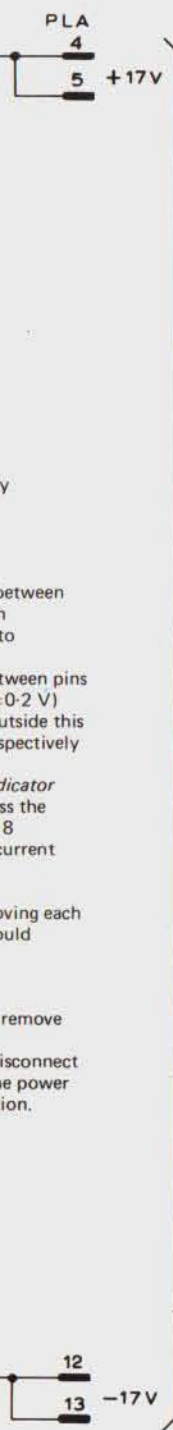
-5V REGULATOR

LM320K05
IC 2

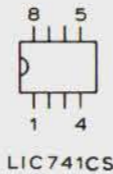
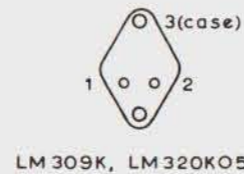
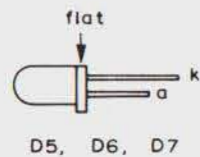
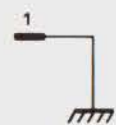
C2 1.0
D4 OA47
case

INDICATOR DIODE

D6 MV5053
R8 180



IC Terminations top view



Note: pins 1, 5, 8 unused