

The invention relates to a short-circuit-proof power pack which is energizable electronically via a control terminal. Such a power pack is for example required for the screen text part of a television receiver. Electronic energizing is necessary because the power pack is designed to be energizable by remote control only with screen text operation.

Known stabilized power packs generally contain in the longitudinal direction a transistor which is controlled at its base in order to stabilize the output voltage. The collector of a further transistor is connected to the base, a reference voltage being applied by a Zener diode to the emitter of this transistor and a component of the output voltage being applied to its base as a control variable for the stabilization.

The object of the invention is to equip a power pack of the kind described with simple switching means so that it is energizable electronically and is protected against short-circuiting at its output.

This object is achieved by the invention described in claim 1. Advantageous developments of the invention are described in the sub-claims.

The circuit according to the invention requires only a few components, since the combined action of the components used ensures both electronic energizing and also protection against short-circuiting at the output. Additional short-circuit protection devices with thyristors of the kind currently used are not required. Energizing of the power pack is of the slow or so-called "soft" kind, because it is an advantage if the load capacitor at the output is first charged and energizing of the actual power pack delayed until this has taken place.

An exemplifying embodiment of the invention is explained by means of the drawing. The power pack represented in the figure receives at the input terminal 1 a non-stabilized d.c. voltage of approx. 6.9 - 7.6 V. A stabilized d.c. voltage of approx. + 5 V is present at the output terminal 2. The power pack contains a known stabilizer circuit with the transistors T3 and T4, the resistors R5, R6, R7, R8 and the Zener diodes D3 and D4. The Zener diode D3 supplies the reference voltage at the emitter of the transistor T4. From the tap of the resistors R7, R8 is derived the control voltage, which is proportional to the output voltage and for the purpose of stabilization controls the transistor T3 at the base via the transistor T4. The smoothing capacitor C1 and the protective resistor R1 are also connected to the input terminal 1.

The additional circuit for the electronic energizing and the short-circuit protection of the power pack consists of the transistors T1, T2, the resistors R2, R3, the capacitor C2 and the diodes D1, D2.

This circuit operates as follows:

When the power pack is in the disconnected state, a voltage of zero volts is present at the control terminal 3. The transistor

T2 is blocked as a result. It therefore conducts no collector current, so that the transistor T1 also receives no base current and is blocked. The input terminal 1 is consequently disconnected from the transistor T3. The whole of the power pack is therefore non-operational.

In order to energize the power pack, i.e. on the start-up of a screen text unit fed by the power pack, a voltage of + 5 V is applied to the control terminal 3 by a remote control device. The capacitor C2 is now loaded via the diode D2 and the previously unloaded capacitor C3. If the capacitor C3 is loaded with a fraction of the definitive operating voltage of 5 V, approx. 0.6 V, the diode D2 cuts out and hence disconnects the base of the transistor T2 from the load capacitor C3. The load capacitor C3 now already has a voltage of + 0.6 V. The power pack is however for the time being still disconnected by the transistors T1 and T3. The load current for the capacitor C2 now continues to flow via the base/emitter section of the transistor T2 and the diode D1. The transistor T2 consequently becomes live and generates a base current at the transistor T1. The transistor T1 likewise becomes live and thus makes a full through-connection, so that the whole of the represented control circuit with the transistors T3, T4 starts to operate. A stabilized voltage of + 5 V is now present at the output terminal 2.

If short-circuiting occurs at the terminal 2, the cathode of the diode D2 is connected to earth, so that the diode D2 becomes live and the forward voltage of the diode D2 of approx. 0.6 V is applied to the base of the transistor T2. In order for the transistor T2 to become live, however, the base/emitter voltage required for the through-connection and the forward voltage of the diode D1 would have to be overcome. The sum of the two last-named voltages is however greater than 0.6 V. The transistor T2 is therefore blocked. The base of the transistor T1 is then no longer activated, so that the transistor T1 cuts out and the control circuit with the transistors T3, T4 no longer receives any voltage. The voltage at the output terminal 2 therefore collapses in a desirable manner, so that the short-circuiting does not pose a threat to components.

If short-circuiting is eliminated, the energizing takes place in the manner described. An advantage of this circuit is that on the through-connection of the transistor T1 and hence start-up of the control circuit, the load capacitor C3 is already loaded with a voltage of + 0.6 V. If the capacitor C3 were to be unloaded at this point in time, the circuit would, when energized, immediately record a short-circuit at the output and shut down again.

The loading procedures described produce a desirable soft application of the voltage at the terminal 2 with a certain delay.

When an exemplifying embodiment according to the figure was tested in practical conditions, the individual components had the following values:

R1: 0.22 ohm
R2: 1 kohm
R3: 10 kohm
R4: 100 ohm
R5: 100 ohm
R6: 390 ohm
R7: 120 ohm
C1: 1000 μ F
C2: 47 μ F

C3: 100 μ F
D1: type 1N4148
D2: type 1N4001
D3: type ZPD2,7
D4: type ZPY5,6
T1: type BD202
T2: type BC548B
T3: type BDX53
T4: type BC548C

The disconnection achieved with the transistor T1 can in principle also be achieved with the transistor T3, so that the transistor T1 can then be dispensed with.

C l a i m s

1. Short-circuit-proof power pack, in particular for a television receiver, which is energizable via a control terminal (3) and comprises in the longitudinal direction an initial transistor (T3) which supplies a dc voltage to a load capacitor (C3) and is controlled at its base by a second transistor (T4), at the base of which a component of the dc voltage and at the emitter of which a reference voltage are applied by a Zener diode (D3), characterised in that between the base of the initial transistor (T3), or of a third transistor (T1) connected in series therewith, and earth lies the collector/emitter section of a fourth transistor (T2) the base of which is connected to the control terminal (3) and via a diode (D2) to the load capacitor (C3).
2. Power pack according to Claim 1, characterised in that between the fourth transistor (T2) and earth lies a diode (D1).
3. Power pack according to Claim 1, characterised in that between the control terminal (3) and the base of the fourth transistor (T2) lies an RC element (R2, C2).

