RESTORATION DELAY UNIT UN14/7

Introduction

The restoration delay unit UN14/7 is used to introduce a delay in the automatic return to normal of the alarm circuit of an error signal unit. The delay maintains the alarm circuit in operation for about 15 minutes after the cessation of the cause of its functioning.

The error signal unit UN1/99, incorporating the UN14/7, is used in various automatic monitors. The inputs from the UN1/99 and the power supply to the UN14/7 depend on the particular installation.

In this description it is assumed that under normal conditions the inputs to the UN14/7 are 0 and −24 volts, giving an effective 24-volt input which is required in all installations. Under alarm conditions the first mentioned input (here assumed 0 volts) always becomes an open circuit. The power supply voltage must always be 24 volts, and is here assumed to be at 0 volts (positive) and −24 volts (negative).

thyristor fires, causing relay RLB to operate. TR2, R6 and C3 form a pulse generator having a repetition rate of about 50 Hz. These pulses applied to TR1 via C2 help to initiate the conduction state of that transistor.

The full sequence of operations is as follows:

1. Initial State

In the normal standing condition, an input of 24 volts is applied between tags 10 and 8. When this voltage is first applied, the thyristor has not yet fired. Relays RLB and RLC are not yet operated and an external lamp LP1 (on the UN1/99) is alight. This is an artificial alarm condition.

2. Normal Condition

C1 charges, and since R1 is connected in parallel with R2, the thyristor fires after about 2 minutes.

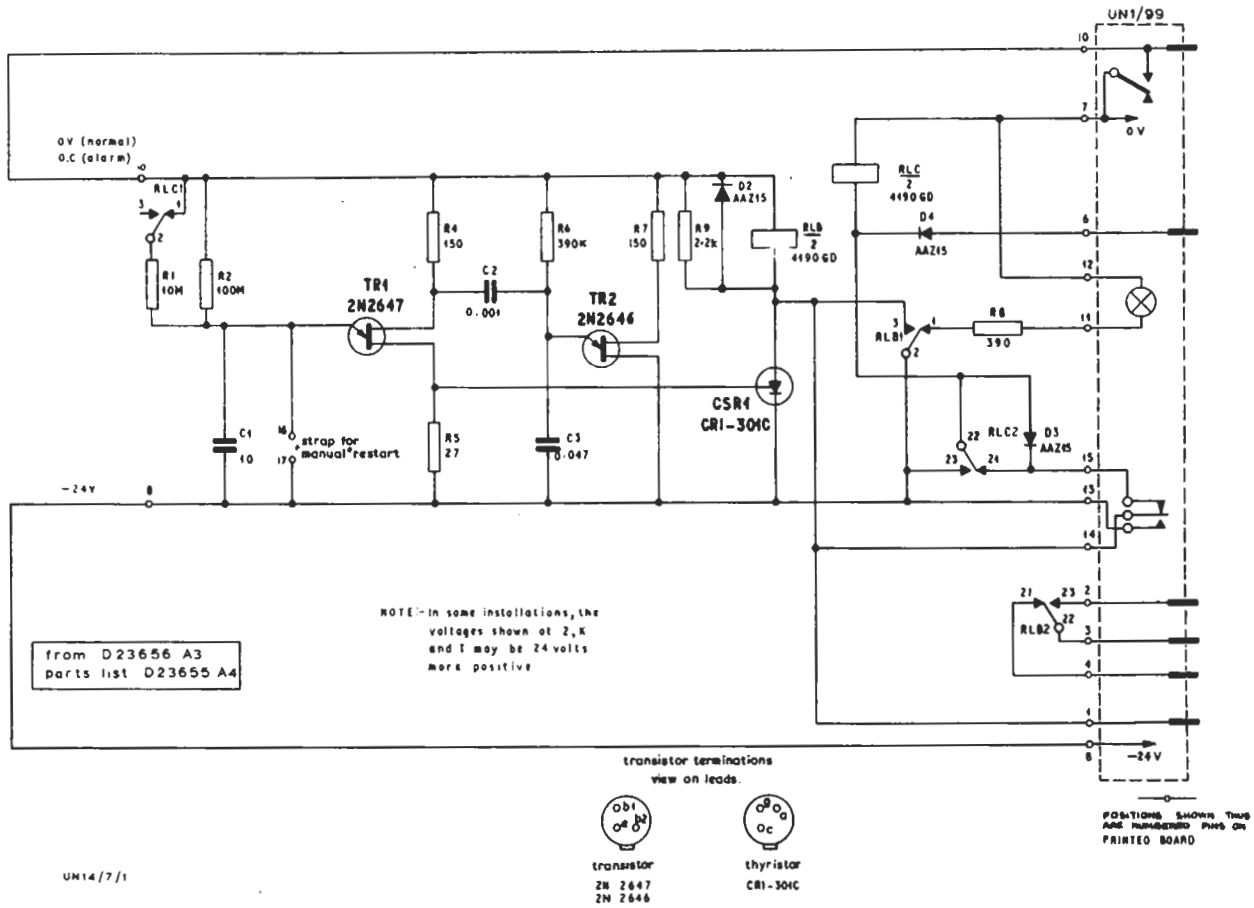

Fig. 1. Circuit of the UN14/7 (Connected in the UN1/99)

Circuit Description (Fig. 1)

TR1 is a unijunction* transistor which provides a trigger pulse for thyristor CSR1. When 24 volts is applied between tags 10 and 8, C1 is charged through R2; after about 15 minutes TR1 conducts and the RLB operates and holds through contacts RLB1. LP1 on the UN1/99 panel goes out. Contacts RLB2 change over; these contacts are connected to PLA on the UN1/99, through which they can be used to switch an external circuit. (The RLB2 contacts are suitable for switching resistive loads up to 30 watts at a maximum of 100 volts d.c. or 1 ampere. Adequate spark quenching must be provided in d.c. circuits.)

* See *Principles of transistor circuits*, by S. W. Amos. Fourth edition, pages 268-270.

RLC is also operated by the –24 volts supply now fed to RLB. Firstly current to RLC coil flows through contacts RLC2 in their unoperated state via tags 14 and 15 via key KA on the UN1/99 panel. Current continues through D3 while contacts RLC2 change over and then feed RLC coil directly with holding current. Contacts RLC1 open-circuit R1 and so increase the charging time of C1 for subsequent operations.

3. Alarm Condition

The 24 volts between tags 10 and 8 is removed and RLB releases. LP1 lights. C1 discharges through TR1. RLC remains operated.

4. Alarm Cleared

The 24 volts input is reapplied between tags 10 and 8. C1 commences to charge via R2, but relay RLB does not operate for 15 minutes, so that LP1 remains alight and no change in the external circuit controlled via contacts RLB2 can take place during this period.

Alarm Re-set Key

Key KA on the UN1/99 front panel, when operated, completes the coil circuit of RLB to the negative line via tags 13 and 14, so that in condition 4 already described RLB can be energised via the key to clear the alarm indication and restore the circuit. A parallel from the coil circuit of RLB is connected to tag 1 to provide an alternative external connection (outside the UN1/99) for the alarm re-set key circuit.

Other Circuit Features

By linking pins 16 and 17 on the UN14/7 circuit board, the delayed automatic resetting action of the unit is made inoperative. It is then always necessary to operate key KA on the UN1/99 panel, or a corresponding externally connected switch, to clear the alarm condition. This includes the artificial alarm condition arising when the unit is initially powered.

Relay RLC is in the released state only when power is withdrawn from the UN1/99 or during the artificial alarm condition when power is initially applied. If it is necessary to actuate or mute external equipment at these times, this may be done by using the RLC operating voltage conveyed via D4 and tag 6 (and a connector on PLA on the UN1/99).

Test Procedure

The UN14/7 is tested as part of a UN1/99. See the Instruction on that unit.

Non-standard Models

Early models of the UN14/7 may differ from the standard in various respects. For example, only one relay may be fitted.

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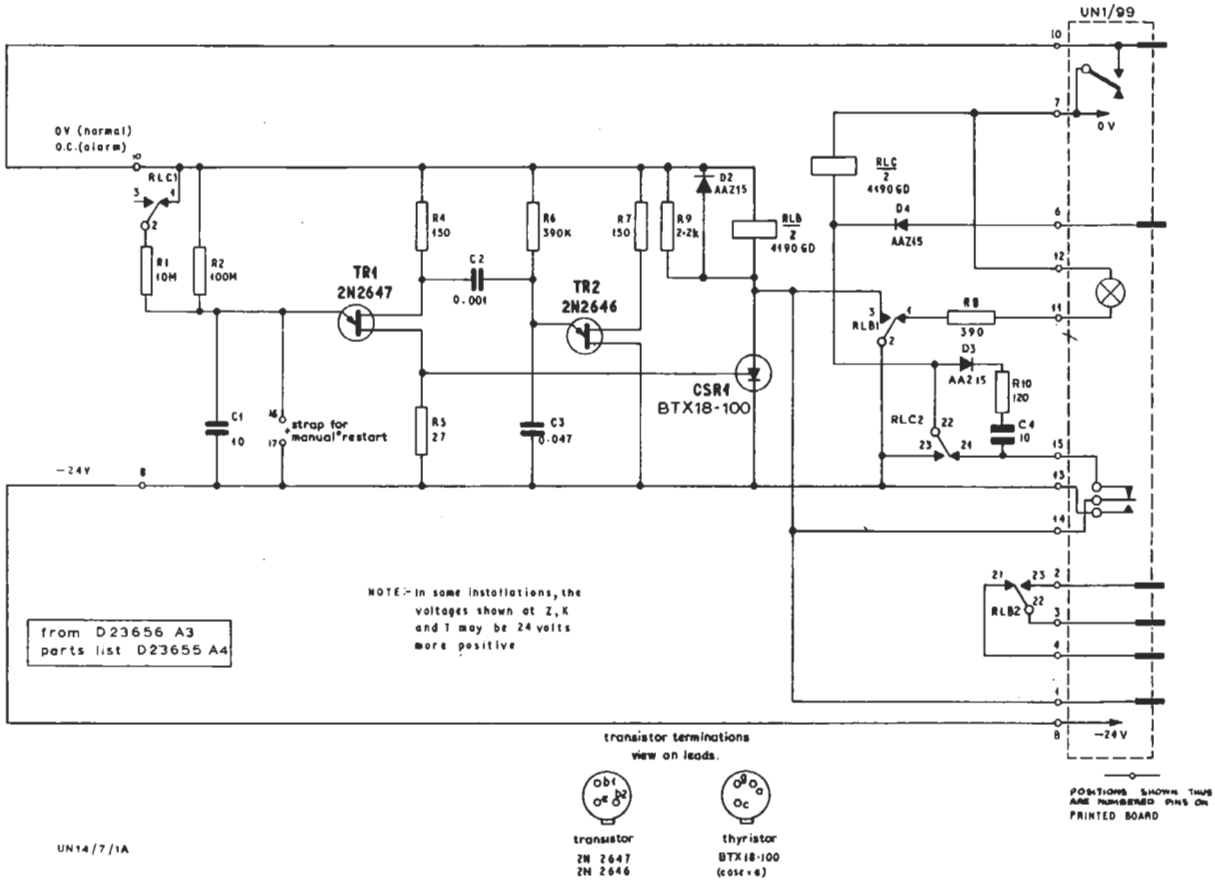

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