SIMPLE QUENCHING-CIRCUIT FOR G. M. COUNTERS

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(Received April 22, 1947)

ACTA PHYSICA POLONICA Vol. IX (1947) Fasc. 1

E. W. Yetter *(1)* proposed a quenching circuit containing one vacuum tube connected in series with the cylinder of the counter. As the author admits, the chief disadvantages of that circuit are: (a) varying potential of the cylinder, requiring shielding and insulation if two or more counters are used, and (b) the low size of the negative output pulse. In addition a negative bias must be applied to the control grid of the quenching tube.

With the circuit shown in Fig. 1 the cylinder of the counter is on a constant potential.

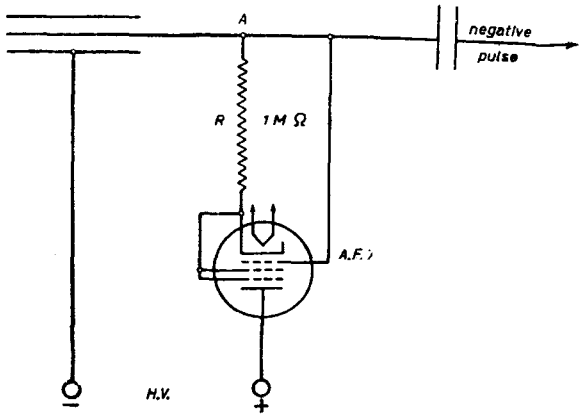

Fig. 1. Quenching Circuit Diagram.

If a sufficiently insulated filament transformer is available, each of the two high voltage supply terminals may be grounded. The principle of the operation of the circuit will be evident from the figure. A current resulting from the passage of an ionizing particle through the G.-M. counter causes a drop of potential across the vacuum tube and the resistor R. Since the potential at A, and therefore at the control grid, is then negative with respect to the cathode, the tube becomes non-conducting and the discharge stops.

Owing to the low value of the resistor R the difference of potentials between the cathode and the grid vanishes quickly causing complete recovery of the circuit. As shown by the cathode-ray oscillograph the recovery time of the system is of the order of 3×10^{-4} sec.

The advantages of the described circuit are: (1) The cylinder of the counter is on a constant potential (zero if required). (2) Similarly to the Yetters circuit, high potential is not applied across the vacuum tube and there is no constant current-drain from the high voltage supply. (3) No additional low voltage sources are needed. (4) The negative output pulses are of sufficiently high size.

The authors wish to express their grateful appreciation to Professor K. Zakrzewski for the facilities given in the course of their experiments.

Reference

(1) E. W. Yetter, Phys. Rev. **53,** 612 (1938).