Chapter 46

HOT WIRE VACUUM SWITCH, TYPE 601V

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Hot wire vacuum switch, Type 601v	Stores Ref. 5CW/5203
Operating voltage	28V, d.c.
Load voltage	28V, d.c.
Maximum load current	5 amp.
Contact closing current	25·45 mA
Contact operating current	60·80 mA
Winding resistance	188 ohm.
Time delay	4 to 25 sec.

Introduction

1. The switch Type 601V, is suitable for controlling alternating or direct current up to 5 amp., 230V. The electrical supply required to operate the switch is 28V, d.c.

DESCRIPTION

General

2. As the title suggests the switch is contained in an evacuated sealed tube, and its successful operation depends on the fact that when an electric current is interrupted by the separation of two surfaces in a vacuum, no arc is produced. Thus the actual contact separation may be very small and with this switch is only about ·001 in. This movement is so small that it can be readily provided by the thermal expansion of a wire through which the control current is passed.

3. The switch (*fig. 1*) consists essentially of two busbars with a spring loaded contact lever working between them. This lever is pivoted on a fulcrum and operates when the hot wire expands. The hotwire winding consists of a number of turns of special steel wire wound between two steatite insulating bobbins. The temperature when the winding is energized is well below that at which creep is liable to occur, and the properties of the winding are not affected by its being continuously energized. The actual contacts are of tungsten. Both the control leads and main leads are brought out to separate pins on a 4 pin moulded base.

Time delay

4. The resistance winding requires a definite time to heat up and so the switch is not instantaneous in action. This time delay is in fact very often used when delayed switching is required and with this particular switch time delays of from 4 to 25 secs. can be catered for.

Inductive loads

5. Inductive loads can be handled by the switch but to prevent the building up of

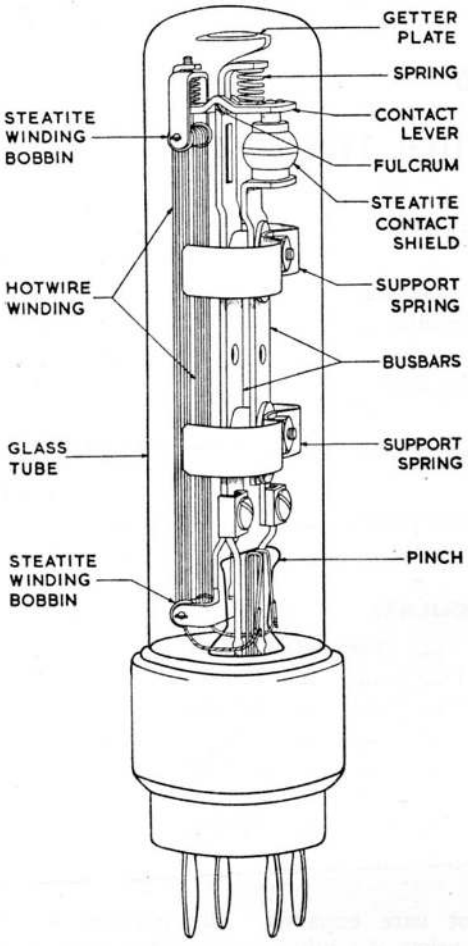

Fig. 1. General view of switch

high transient voltages a suitable surge suppressor must be fitted across the inductive load terminals.

OPERATION

6. The operation can best be seen by referring to fig. 2 which is a diagrammatic representation of the switch. T and T1 are terminals of the main circuit it is necessary to control. A and B are the busbars referred to in fig. 1, A terminating in the spring S attached to the lever C. This spring tends to swing the lever about the fixed fulcrum F, closing the gap G. At the other end of the lever C, is the bobbin D, round which passes the resistance wire W, rigidly fixed to the terminals H and H1. By tensioning this wire the spring S is compressed and the gap

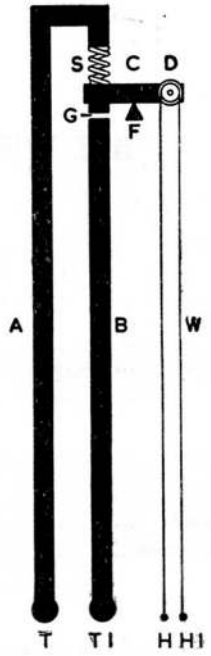

Fig. 2. Diagram of switch action

G opened. This represents the open or "off" position of the switch. If now a small current is applied to the wire W, it is heated and expands, allowing the spring S to take control and hold the contacts together. There is now a complete circuit between T and T1.

INSTALLATION

7. The switch is fitted with a 4 pin, valve type base (*fig. 3*). If installed in a position where it is likely to suffer shock or vibration it should be resiliently mounted.

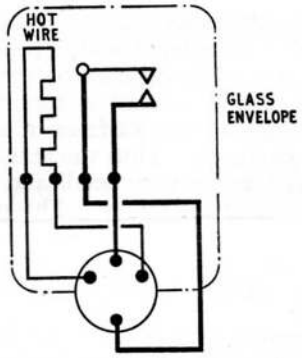

Fig. 3. Circuit diagram

5889 588014/8390 6/56 2125 C & P Gp. 1