Chapter 8

MAGNETIC RELAY SWITCHES, TYPE S

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Type	Stores Ref.	Voltage	Rating (amp.)	No. of poles	Overall dimensions (in.)	Weight (oz.)
S1	5CW/3942	24	25	2	2·74 × 1·1 × 2·0	8¾
S2	5CW/3943	24	25	2	4·13 × 2·06 × 2·91	17¾
S3	5CW/3944	24	10	4	2·74 × 1·1 × 2·0	8¾
S4	5CW/3945	24	10	4	4·13 × 2·06 × 2·72	17¾
S5	5CW/5529	24	2 / 10	3 / 1	2·74 × 1·1 × 2·0	8¾

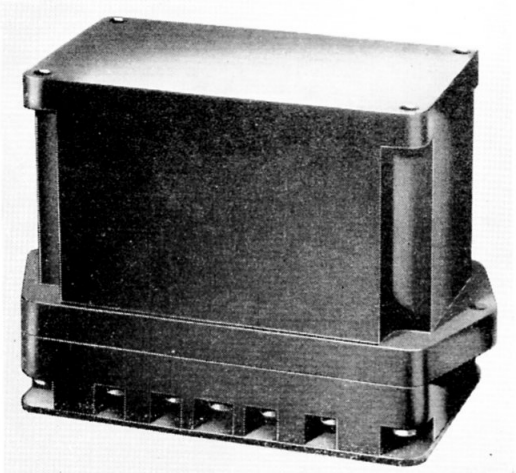

Fig. 1. Magnetic relay switch, Type S2

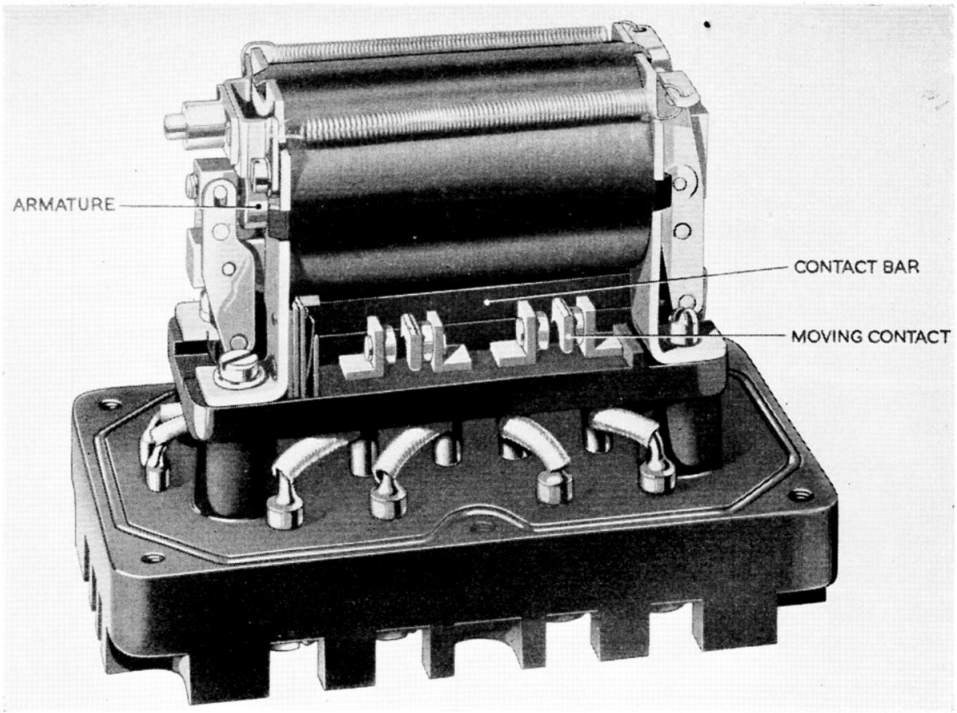

Fig. 2. Magnetic relay switch, Type S2, showing cover removed

Introduction

1. The magnetic relay switches, Type S, are general purpose change-over switches for operation on 24 volts.

DESCRIPTION

2. Type S1 and S2 are 25 amp. double-pole change-over switches, and are similar, apart from the fact that the Type S2 is enclosed in a weatherproof case with terminals. The S1 is shown in fig. 3 with the cover removed, and the S2 in fig. 1 and 2.

3. Type S3 and S4 are 10 amp. 4-pole change-over switches, and are comparable to the S1 and S2, in that the S4 is the weatherproofed version of the S3.

4. Type S5 is similar to Type S3, with four pairs of change-over contacts. Three pairs, however, (3–4, 5–6, and 7–8), have contacts of a special material to make them suitable for light currents of up to 2 amp.; the other pair of contacts (1–2) is suitable for currents of 2–10 amp.

5. Fig. 4 indicates the terminal markings for each type of switch, and shows the unoperated positions, with even-numbered contacts closed. When the coil is energized, the lateral movement of the armature inside the coil breaks the even-numbered contacts and closes the odd-numbered contacts. Contact is made and broken by a moving contact bar, fitted with spring-loaded contacts.

SERVICING

6. The contacts of the relay switches must be kept clean, and the units should be subjected periodically to the following tests.

Note . . .

◀ *In no circumstances should coil assemblies of different switches be interchanged, or be secured to bases other than their own, neither should a coil assembly be renewed separately. The coil and base are matched items, and combine to make up the contact assembly; a switch faulty in either part should therefore be renewed complete.* ▶

Functional test

7. On a gradually increasing voltage, check that the closing voltage of the relay is set between 13 and 18 volts with the coil cold (approx. 20 deg. C.).

8. The relay should close in one movement, and the armature should complete its full

travel in one movement at the closing voltage as measured in para. 7.

9. On a gradually decreasing voltage, check that the release voltage does not exceed 8 volts.

Contact resistance

10. ◄ Measure the millivolt drop between the normally-closed contacts, with currents as shown below; the millivolt drop in each instance should not exceed 150 millivolts.

Type	*Current*	*Contacts*
S1, S2	25	All
S3, S4	10	All
S5	10	1–2
	2	3–4, 5–6, 7–8 ►

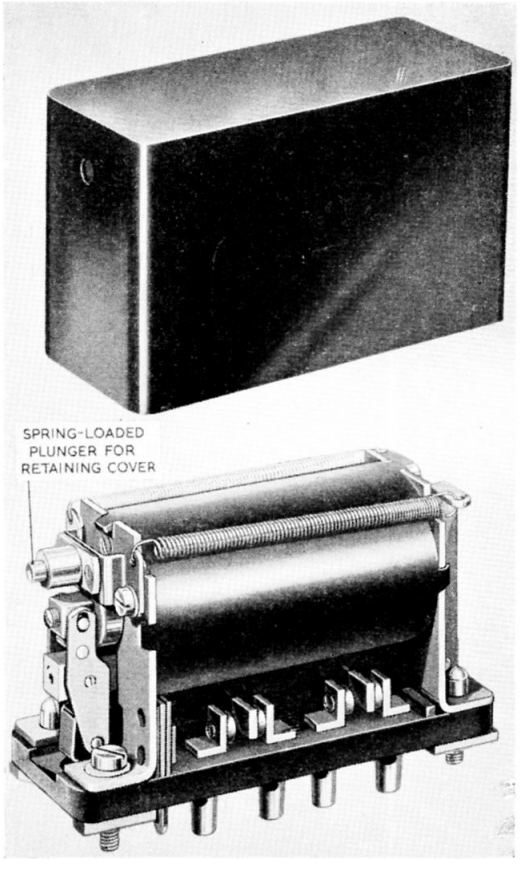

Fig. 3. Magnetic relay switch, Type S1

Note . . .

It is preferable for this reading to be taken across the appropriate terminals, and not across the contacts themselves; this obviates the necessity for removing the cover during testing. Switches which have been in storage should be operated three or four times before checking the millivolt drop, to remove any possible oxidation of the contacts.

11. Repeat the test given in para. 10 on the normally open contacts with the coil energized from a 24 volt d.c. supply.

Insulation resistance

12. The insulation resistance should be measured between the following points with a 250-volt insulation resistance tester, and should not be less than 20 megohms:—

(1) Between the coil terminals and the frame.

(2) Between all main terminals and the frame.

(3) Between all terminals not normally connected together in the unoperated position.

(4) Between all terminals not normally connected together in the energized position.

Coil resistance

13. Check the coil resistance of the relay which should be 123 ohms ± 5 per cent. at 20 deg. C.

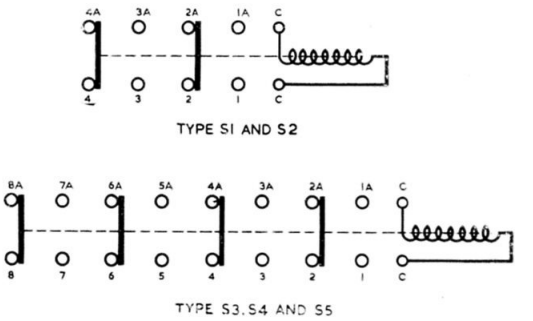

Fig. 4. Circuit diagrams