Chapter 23

TRANSFORMER RECTIFIER UNIT, ROTAX, TYPE U5201/1

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LEADING PARTICULARS

Transformer rectifier unit, Type U5201/1	*Ref. No. 5UC/6856*
Transformer input (a.c.)	32 *amp. per line*
Transformer output (a.c.)	6·20 *amp. per line* (8·2 *amp.*, 14*V d.c.*)
Frequency	400 *c/s*
Phase	3
Rating	*Continuous*
Associated equipment	*CA1102 double rotary actuator*
Overall dimensions—	
Length (including mounting feet)	7·062 *in.*
Width (including terminal boxes)	5·738 *in.*
Width (less terminal boxes)	3·687 *in.*
Height	4·437 *in.*
Weight	4 *lb.*

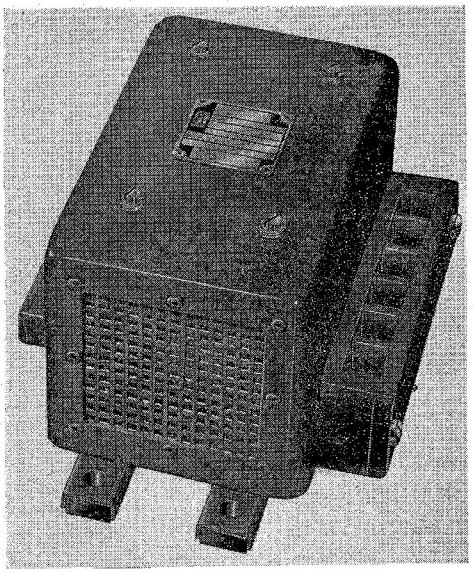

Fig. 1. Transformer rectifier unit, Type U5201/1

Introduction

1. The transformer-rectifier unit, Type U5201/1, is a low-voltage, 3-phase, 400 c/s current transformer, incorporating a diode rectifier assembly and an electrolytic capacitor. Its normal application is to supply d.c. to the brake coils of the two driving motors fitted to the CA1102 rotary actuator.

DESCRIPTION

2. The unit (fig. 1 and 2) incorporates six diode rectifiers, a current transformer, a 250 μF capacitor, together with a connection board and a.c. and d.c. terminal blocks. The transformer side brackets, in conjunction with round and hexagonal spacers, support the transformer assembly and diode rectifiers, the whole being assembled on to the mounting plate assembly.

3. The a.c. and d.c. terminal block and cover assemblies are mounted on the side faces of the mounting plate, to the base of which is fitted the mounting channel assembly with

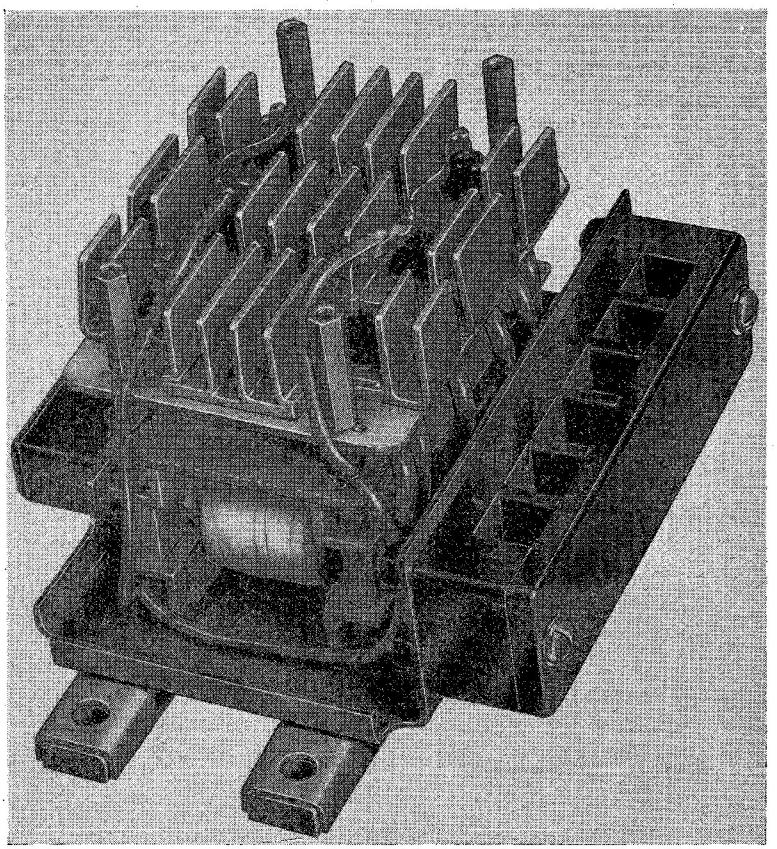

Fig. 2. View with cover removed

integral mounting feet. The 250 μF capacitor is secured to a retaining plate by a mounting clamp, screw and locknut, the retaining plate being held to the base by two ch/hd. screws with associated washers and locknuts.

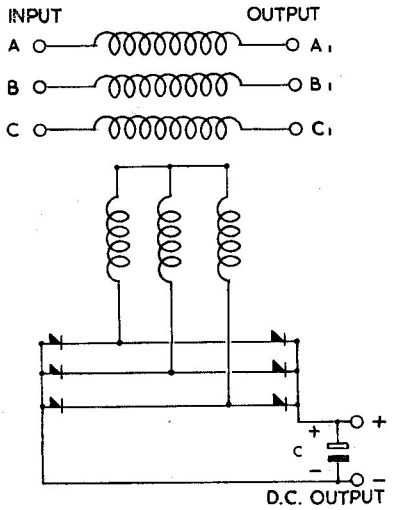

Fig. 3. Diagram of internal connections

4. The complete transformer and diode rectifier assembly, including the 250 μF capacitor, is housed within a metal cover which is perforated at both ends. The cover is secured to four hexagonal spacers mounted on the rectifier insulating base by ch/hd. screws and associated locking washers. The a.c. and d.c. terminal block and cover assemblies project outside the metal case of the unit; the a.c. terminal block is mounted on the right-hand side of the unit as shown in fig. 1 and 2, and the d.c. terminal block on the left-hand side.

5. A diagram of connections is given in fig. 3. Terminals A, B, and C, are the 3-phase input and terminals A1, B1, C1, the 3-phase output, star connected in series with the actuator motor field. The 3-phase input is first stepped down in the transformer and then rectified to give 14·4 to 15·3 volts d.c. with output current between 8·45 and 9 amp. at the + and − terminals. The 250 μF electrolytic capacitor is connected across the d.c. output terminals as shown in fig. 3, to control the ripple content of the d.c. output and so give diode protection under transient conditions which occur during starting. It is important that an insulation test should not be made between terminals + and − as this voltage would cause damage to the capacitor.

Electrical connections

6. Six 2 B.A. terminals suitable for cable lugs, Ref. No. 5X/◄9400079►, are provided on the a.c. terminal block; two 4 B.A. terminals suitable for cable lugs, Ref. No. 5X/◄9400384►, are also provided for the d.c. + and − terminals.

INSTALLATION

7. The unit should be mounted in a vertical plane, with the a.c. terminal block situated on the right-hand side. The four fixing feet provided are located at the ends of the mounting channel, having four 0·328 in. dia. holes positioned on 6·375 in. × 1·875 in. centres respectively.

SERVICING

8. Servicing is normally confined to ensuring that the unit is clean and free from damage; all terminal block screws and external nuts and screws should be checked for tightness. The insulation of the connecting leads should be examined for signs of fraying or deterioration and all connections should be checked to ensure that they are secure.

Testing

9. If the serviceability of the unit is suspect, it may be tested as laid down in Appendix A.

Appendix A

STANDARD SERVICEABILITY TEST FOR TRANSFORMER-RECTIFIER UNIT, ROTAX, TYPE U5201/1

Introduction

1. The following tests may be applied to the unit before it is put into service, or at any time when its serviceability is suspect.

Test equipment

2. The following test equipment is required:—

(1) Resistor, 1·7 ohms.

(2) Low voltage, 3-phase, 400 ± 2 c/s a.c. supply.

(3) Suitable ammeters, 0-50A a.c., 0-15A d.c.

(4) Testmeter, Type F (Ref. No. 5QP/1) or suitable equivalent.

(5) Capacitor, 1 μF (e.g. Rotax N67199).

(6) Insulation resistance tester, Type A (Ref. No. 5G/1621).

Testing

Performance test

3. (1) Star connect terminals A1, B1, and C1, using suitable cables.

(2) Connect a resistance of 1·7 ohms between terminals + and —.

(3) Supply low-voltage, 3-phase, 400 ± 2 c/s a.c. to terminals A, B, and C.

(4) Adjust the input a.c. line current to a mean value of 32 amp. The individual input line currents must be between 31·75 and 32·25 amp.

(5) Maintain the conditions in sub-para. (4) for a period of 10 min., after which the d.c. output current should be between 8·45 and 9 amp.

(6) With the unit connected and supplied as above, connect a suitable testmeter, set to the 25V a.c. range, in series with a 1 μF capacitor (such as Rotax N67199) across the + and — terminals; the reading must not exceed 0·2V. A voltage in excess of this value indicates a faulty 250 μF capacitor (Rotax N150822-1).

Insulation resistance test

4. The insulation resistance, measured with a 500-volt insulation resistance tester between the following points, should not be less than 10 megohms.

Terminals A, B, and C and frame.

Terminals A, B, and C, and d.c. ouput (+ and — shorted together).

Terminals A and B.

Terminals B and C.

Terminals A and C.

Terminals and the frame (+ and — shorted together).

Note . . .

An insulation resistance test should not be taken between positive and negative terminals (+ and —).