Chapter 15

COMPOUNDING UNIT, ROTAX, TYPE U3001/1 AND VARIANTS

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Compounding unit, Type U3001/1	... *Ref. No. 5UC/5986*
Input current	90 *amp. and* 210 *amp.* (*three-phase a.c.*)
Input frequency	165 *c/s to* 500 *c/s*
Output current	22 *amp.*
Output voltage	16 *volts d.c.*
Rating	*Continuous*
Temperature range	−30 *deg. C. to* +55 *deg. C.*
Maximum altitude	50,000 *ft.*
Weight	19 *lb.*

Introduction

1. The U3001/1 compounding unit is used in conjunction with transformer rectifier unit, Type U3102, and a wide speed range a.c. generator having two separate outputs. Its purpose is to provide the field current with an additional source of d.c. supply which is proportional to the line current of the generator. A particular application is its use in the Type 154 generator system as described in A.P.4343, Vol. 1, Sect. 2, Chap. 7.

DESCRIPTION

2. The unit comprises a compounding transformer with two primary windings and a three-phase bridge rectifier, interconnected to provide a rectified a.c. output.

3. The fabricated housing for the components is formed from four steel panels and is divided into two compartments by an additional panel which runs throughout its length. One of the compartments is 4 ins. wide and the other 2 ins. wide; it is between the dividing panel and the side panel of the larger compartment that the compartments are actually mounted, the smaller compartment being used as a by-pass passage for cooling air for the generator. So that the unit may be easily connected to the air cooling apparatus, the open ends of the housing are each provided with a mounting flange having 18 fixing holes 0·218 in. dia., as shown in fig. 2.

4. Directly over the larger of the two compartments the top panel has a rectangular cut-out, 16·25 in. × 2·375 in., covered by the terminal block mounting assembly, to which the four terminal blocks are bolted. The leads from the transformer and rectifier are passed through this cut-out and a similar cut-out in the terminal block mounting assembly and are taken to the underside of the terminal blocks. They are then secured to the lower end of their appropriate terminal post.

INSTALLATION

5. Full dimensional details of the unit are shown in the installation diagram, fig. 2. It is important that the unit is installed so that cooling air can be drawn into the rectifier end of the housing at the rate of 20 cu. ft. per min.

Electrical connections

6. Electrical connections to the unit are made via aluminium crimping lugs which are fitted to each of the fourteen terminal posts. The reference numbers of these lugs are as follows:—

(1) Terminals G1, G2, G3—Ref. No. 5X/9400127

(2) Terminals L1, L2, L3—Ref. No. 5X/9400138

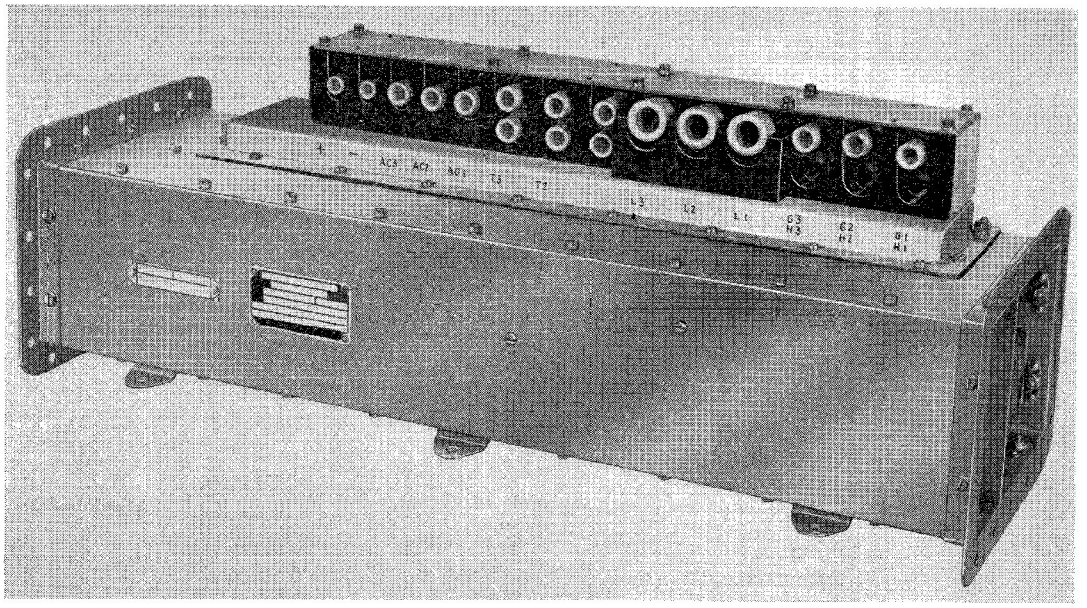

Fig. 1. General view of U3001/1 compounding unit

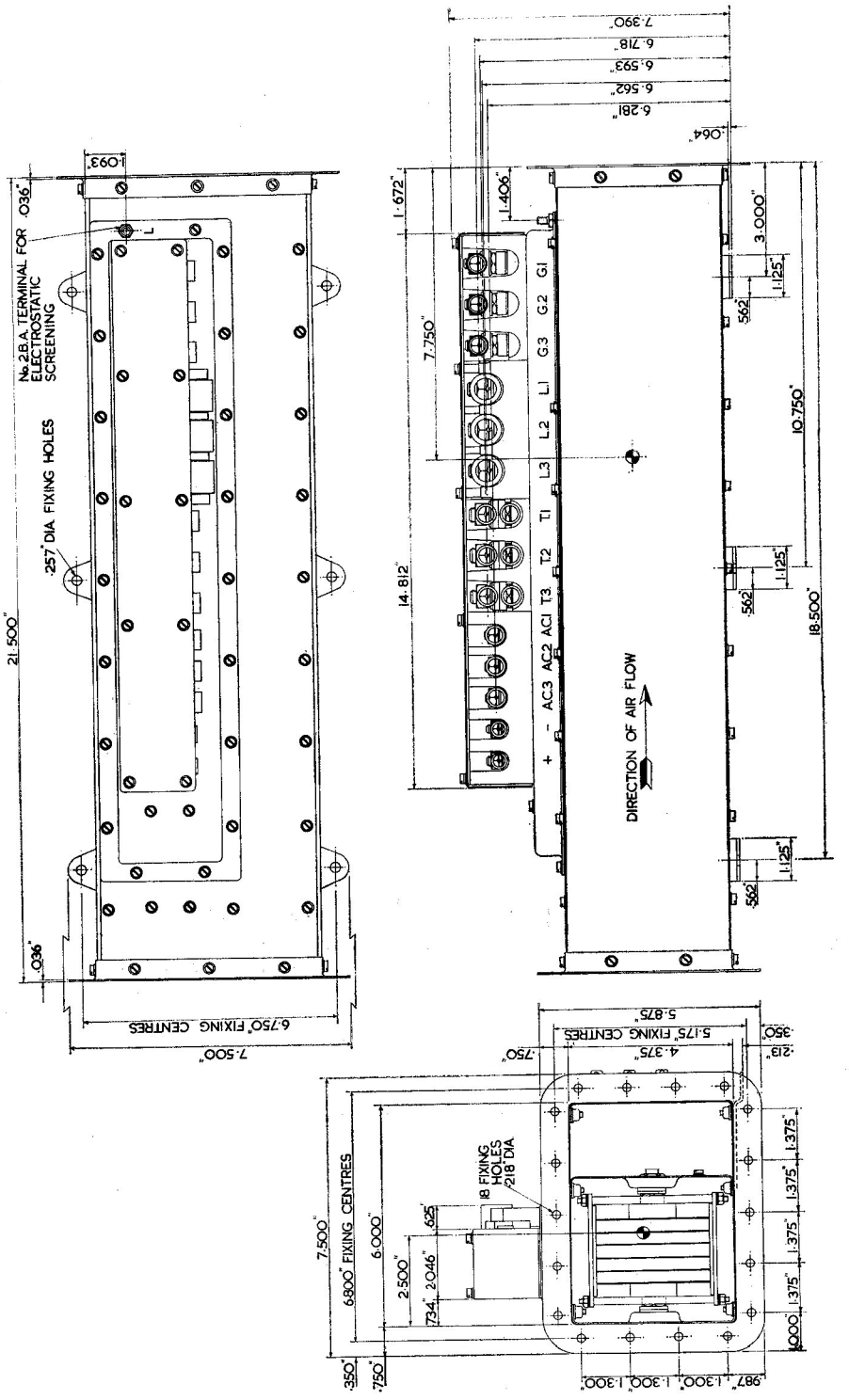

Fig. 2. Installation diagram

(3) Terminals T1, T2, T3—Ref. No. 5X/9400128 (two to each terminal post)

(4) Terminals AC1, AC2, AC3—Ref. No. 5X/9400123

The terminal block is covered by a metal strap which must be removed before any of the aluminium crimping lugs can be replaced.

SERVICING

7. Remove the terminal cover strap and examine the terminal mouldings for signs of cracks or distortion, at the same time check that the electrical connections are clean and secure.

Insulation resistance tests

8. The insulation resistance between each of the following points should not be less than 5 megohms, when measured with a 500-volt insulation resistance tester.

(1) Frame and terminals G1, G2, G3
(2) Terminal G1 and terminals G2, G3, L1, L2, L3
(3) Terminal G2 and terminals G3, L1, L2, L3
(4) Terminal G3 and terminals L1, L2, L3
(5) Frame and terminals L1, L2, L3
(6) Terminal L1 and terminals L2, L3
(7) Terminal L2 and terminal L3
(8) Frame and negative terminal
(9) Negative terminal and terminals G1, G2, G3, L1, L2, L3

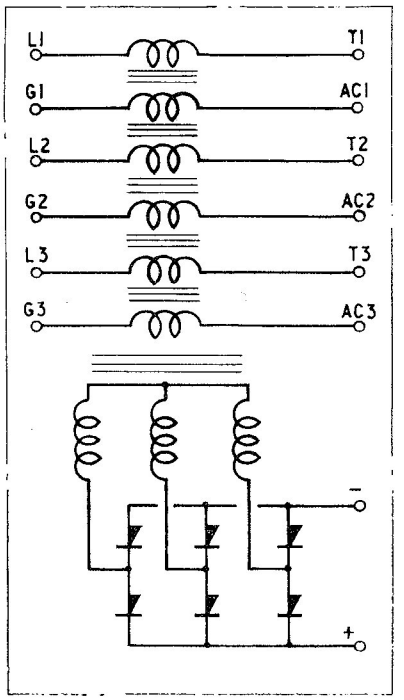

Fig. 3. Diagram of internal connections

Appendix 1

COMPOUNDING UNIT, ROTAX, TYPE U3001/2

LEADING PARTICULARS

Compounding unit, Type U3001/2	*Ref. No. 5UC/7349*
Input current	90 *amp.* — 210 *amp.* (*three-phase a.c.*)
Input frequency	165 *c/s to* 500 *c/s*
Output current	22 *amp.*
Output voltage	16 *volts d.c.*
Rating...	*Continuous*
Temperature range	— 30 *deg. C. to* + 55 *deg. C.*
Maximum altitude	50,000 *ft.*
Weight	19 *lb.*

1. The U3001/2 compounding unit is electrically identical to that described and illustrated in the main chapter, but with certain mechanical alterations embodied, by the introduction of modification B/528 (Rotax S.P.6178) (Classification B2). This raised the code No. of the U3001/1 to U3001/2.

2. Modification S.P.6178 introduced re-routing and clamping of compounding transformer leads; the leads have been re-routed within the unit, and a special bracket assembly, 'P' clips and cable straps secure the leads to the frame and side panels.

3. Re-routing and clamping of the transformer connection leads has been effected to obviate the hazard of fretting and subsequent breakdown in service; additional clearance for the leads has also been provided by the introduction of glass board packing fitted between the terminal block and the top panel, and between the terminal block and associated cover assembly.

4. The associated compounding transformer P3002 connection leads have been re-routed and secured to predetermined dimensions; the code No. P3002 has been raised to P3002/1.

5. The introduction of the above changes to the unit has altered certain overall height dimensions in the Installation Diagram (*fig.* 2) of the main chapter, and should now read as follows:—

Height 7·390 in. increased to 7·452 in.

Height 6·718 in. increased to 6·781 in.

RESTRICTED

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