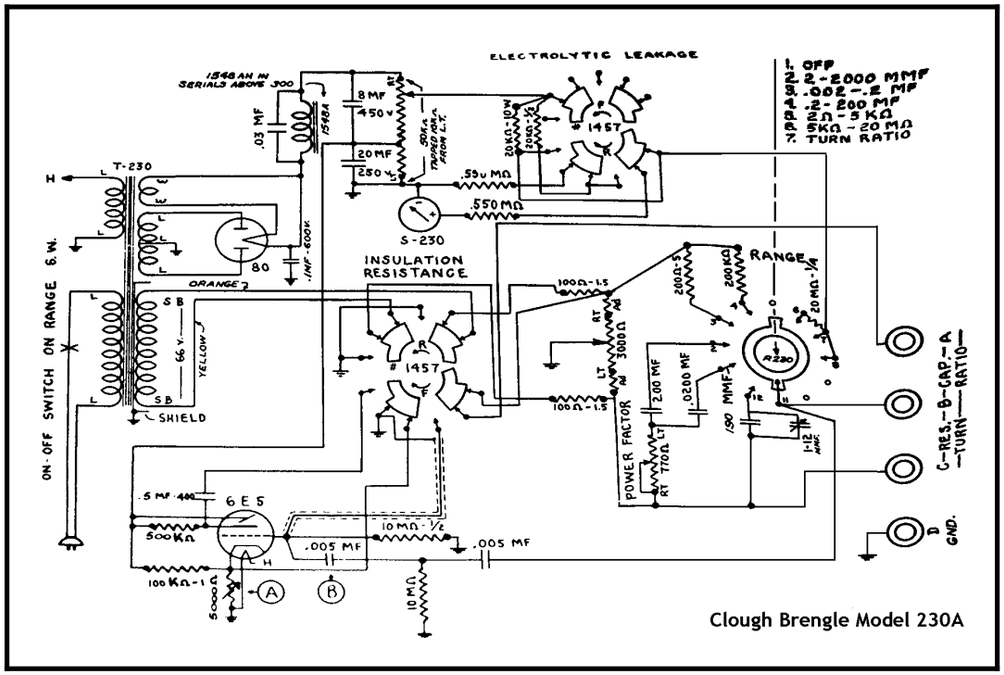
The CLOUGH-BRENGLE CO.

INSTRUCTIONS Model 230-A AC Bridge INSTRUCTIONS



101.INSTALLATION. Be sure the voltage and frequency of the power line correspond to the nameplate.60 cy. units will operate on 50 cy. and 25 cy. units on 40 cy. with Power Factor dial corrected.(See Par. 103.)

"OFF" on RANGE switch interrupts the line circuit.

Connect a good ground to the Black post, not needed for larger capacitors but essential for best accuracy on 250 MMF. or less and for most accurate Insulation-Resistance determinations.

102.MEASURING CAPACITY. Connect unknown capacitor to Green and Red posts (A- & B+). Observe polarity with electrolytic units. Turn RANGE switch to approximate value and rotate dial to balance with "eye" open and read Capacity from dial.

If no numerals on dial where balanced use higher or lower range and rebalance for best accuracy.

OPEN CONDENSERS will balance at the extreme left.
SHORTED CONDENSERS will balance at the extreme right.

103.POWER FACTOR. Broad balance point and fuzzy pattern indicate poor power factor. Turn POWER FACTOR dial until clean, sharp balance is obtained and read % P.F. from dial. Divide readings by 100 for .002-.2 MF. range. Good electrolytics will show P.F.-10-12%. Good paper units less than .1%.

For 60 cy. instrument on 50 cy. line multiply F.F.by 5/6. For 25 cy. instrument on 40 cy. line multiply P.F. by 1.6.

104.P0LARIZING VOLTAGE. To avoid shock from the binding posts, the VOLTAGE knob will ordinarily be turned all the way left and the meter will read zero V.

To measure electrolytic condensers with polarizing voltage applied, set the RANGE switch according to capacity rating and the meter to the working voltage of the condenser. Connect condenser to the posts A & B, observing polarity. The voltage will fall and then rise, indicating correct formation and charging of the condenser. If voltage does not rise after two or three seconds the condenser is shorted or leaking badly and should be disconnected to avoid damage to the power supply unit. If voltage rises, readjust to exact working voltage of condenser and proceed to measure C and P.F. as in Pars. 102 and 103.

Polarizing voltage should never be applied to AC electrolytic units.

105.LEAKAGE IN ELECTROLYTIC CONDENSERS is determined with the connections and adjustments above. After the unit has formed completely (15-20 seconds may be required if it has not been used for some time) the meter voltage should be accurately adjusted to the working voltage of the condenser. Pressing the ELECTROLYTIC LEAKAGE key to the right will cause the meter reading to rise. If the reading rises beyond the intersection of the curved voltage line with the capacity arc, the condenser is defective. Example:

Suppose- the condenser is marked 20 MF-300V. Set meter to 300 volts after formation is complete. Press key to right. Visually, follow the curved line from "300" on the scale to where it intersects the arc across the scale from 20 MF. If the meter needle is below this intersection the leakage is satisfactory. If above, reject.

Off decimal values such as 8 and 16 MF. may be tested in the same way and about 8/10 as much rise permitted for 8 MF., for example, as would be permitted for a 10 MF. condenser. Electrolytic condensers usually run higher than the marked capacity so close rejections should be made on measured capacity not on the marked value.

106.INSULATION RESISTANCE of paper and mica condensers and other parts is determined by connecting the sample to posts A & B and holding the INSULATION RESISTANCE key to the left. The eye pattern will close. The VOLTAGE knob is advanced until the pattern remains. Just open. With the larger sizes of capacitors each readjustment of the VOLTAGE knob may possibly make the eye open momentarily due to the change of charge on the condenser. When that voltage has been reached which makes the eye pattern Just open permanently, read the insulation resistance in megohms on the upper scale of the meter.

Under extremely humid weather conditions, it may be necessary to turn on the power for a few minutes before using in order to dispel moisture from the surface of insulating parts. Proper operation can be assured by checking the resistance with the binding posts open to see that the pattern remains closed at the higher applied voltages.

107.RESISTANCES from 2 ohms to 20 megohms are measured by connecting them to posts B & C and selecting a suitable RANGE. Balance in the same manner as for capacity. Turn the VOLTAGE dial to zero so the power supply or resistor will not be damaged.

108.TURNS RATIO of unmarked transformers is measured by connecting one winding to posts A & B and the other to posts B & C. Set RANGE to TURN RATIO and balance the bridge. Read the first dial and divide by 200 to obtain the ratio in the sense of BC/AB.

If no balance is obtained reverse the connections to one of the windings. If a fuzzy balance is obtained reverse the connections to both windings to eliminate the effect of adjacent capacity between them.

This instrument is warranted for one year from date of shipment from the factory in accordance with the terms and conditions of our standard warrantee enclosed.

These notes and circuit diagram are completely informative and no other instruction is available for the #230.

FORM 301-52

(Printed in U.S.A.)