INSTRUCTIONS

TYPE SU VOLTAGE REGULATING RELAYS

Adjustment On Step Regulators

TYPE SU VOLTAGE REGULATING RELAYS on Step Regulators are adjusted as follows:

1. Press down the balance arm firmly into the pivot bearings and, by moving the left-hand tip of the balance arm from front to rear, note that there is a definite location where the balance arm shaft fits in the V of the stationary bearing fairly near to the center of its movement as limited by the clearance of the plunger inside the operating coil, and by the cover plate on the bearing.

Note: Be sure there is no interference between any of the mechanical parts, coil and plunger, etc. On primary relays with dynamic compensators, clean the rheostat contact surface and brush contact and set on zero compensation. These surfaces may be cleaned by turning the rheostat knob back and forth over its entire range several times. Some customers clean the rheostat surfaces by brushing them with carbon tetrachloride.

2. Remove the magnetic circuit adjusting or "hold-in" screw on top of the voltage coil. Rotate the permanent magnet so that its poles point away from the panel. Adjust contacts wide apart.

3. ***Primary Relay with Friction Damping Device.*** With rear washer of the damping device pushed back and resting on the steady pin, and the arm balanced by applied voltage, note that the arm swings freely up and down without being restricted by friction when the control switch is opened and closed.

4. ***Primary Relay with Dynamic Compensator.*** Set the compensator on zero. The damping due to the compensator cannot be totally removed. Therefore, the check for friction must be carefully made in this case to distinguish "excess" friction from that inherent in the compensator. Note that the balance arm should be stabilized within approximately four swings when the control switch is thrown off and on with the test voltage maintained at the value for which the relay would balance.

5. ***Primary Relay with Friction Damping Device.*** Replace the rear damping device washer to its normal position and adjust the damping device spring so only sufficient pressure will be supplied to stabilize the balance arm within approximately four swings when the control switch is thrown off and on with the test voltage maintained at the value required to balance the relay.

6. With the relay balanced, replace the magnetic circuit adjusting screw (see part 2). Turn the screw down until the balance arm tip moves upward about $\frac{1}{8}$ inch.

7. Align the tip of the permanent magnet with the balance beam.

With the contacts adjusted so they will not engage until the left hand tip of the arm is $\frac{1}{8}$ inch above or below the tips of the compounding magnet, adjust the compounding magnet gap so the tip of the balance arm will break away from the compounding magnet by raising or lowering the applied voltage by an amount equal to the desired operating band width. Reducing the gap increases the amount of voltage change required and increasing the gap reduces the amount of voltage change required. Read voltage at instant of "snap-away".

8. Adjust the contact spacing so the regulator will restore the voltage, raising or lowering, to a value midway between those required to cause operation. Note that at the mid-voltage value, the left tip of the balance arm will stand slightly above the center of the permanent magnet pole tips. Increasing the contact spacing causes the voltage to be corrected farther after contact is made and decreasing the spacing causes it to be corrected less. Turning the magnet circuit adjusting screw in increases this compounding also. If the magnetic circuit adjusting screw is moved, the balance voltage point as well as the compounding will be changed.

9. Obtain the desired value of voltage to balance the relay by moving the balance weight on the top of the balance arm by means of the adjusting screw.

10. Adjust the compensator to maintain desired load-center voltage.

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INSTRUCTIONS

TYPE SU VOLTAGE REGULATING RELAYS

Adjustment On Step Regulators

TYPE SU VOLTAGE REGULATING RELAYS on Step Regulators are adjusted as follows:

1. Press down the balance arm firmly into the pivot bearings and, by moving the left-hand tip of the balance arm from front to rear, note that there is a definite location where the balance arm shaft fits in the V of the stationary bearing fairly near to the center of its movement as limited by the clearance of the plunger inside the operating coil.

Caution: Be sure there is no interference between any of the mechanical parts, coil and plunger, etc.

2. Remove the magnetic circuit adjusting or "hold-in" screw on top of the voltage coil.

3. ***Primary Relay with Friction Damping Device.*** With rear washer of the damping device pushed back and resting on the steady pin, and the arm balanced by applied voltage, note that the arm swings freely up and down when the control switch is opened and closed without being restricted by friction.

4. ***Primary Relay with Dynamic Compensator.*** Set the compensator on zero. The damping due to the compensator cannot be totally removed. Therefore, the check for friction must be carefully made in this case to distinguish "excess" friction from that inherent in the compensator. Note that the arm swings freely up and down when the control switch is opened and closed.

5. With the contacts adjusted so they will not engage until the left hand tip of the arm is 1/8 in. above or below the tips of the compounding magnet, adjust the compounding magnet gap so the tip of the balance arm will break away from the compounding magnet by raising or lowering the applied voltage by an amount equal to the desired operating band width. Reducing the gap increases the amount of voltage change required and increasing the gap reduces the amount of voltage change required.

6. ***Primary Relay with Friction Damping Device.*** Replace the rear damping device washer to its normal position and adjust the damping device spring so only sufficient pressure will be supplied to stabilize the balance arm within approximately four swings when the control switch is thrown off and on.

7. ***Primary Relay with Dynamic Compensator.*** The balance arm should be stabilized within approximately four swings when the control switch is thrown off and on. Return the compensator setting to the desired value.

8. Adjust the contact spacing so the regulator will restore the voltage, raising or lowering, to a value midway between those required to cause operation. Note that at the mid-voltage value, the left tip of the balance arm will stand slightly above the center of the compounding magnet pole tips. Increasing the contact spacing causes the voltage to be corrected farther after contact is made and decreasing the spacing causes it to be corrected less.

9. Set the voltage to a value which will just close the "lower" contacts. This will be about one volt above the balance voltage. Adjust the left stationary contact until its spring is deflected about 1/2 its travel. Replace the hold-in screw turning it in until it moves the plunger a little further into the coil. Lock screw in place. Lower the applied voltage to the balance voltage; if the relay fails to return to its balance position the hold-in screw should be backed off slightly.

10. Obtain the desired value of voltage to balance the relay by moving the balance weight on the top of the balance arm by means of the adjusting screw.

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