ary resistance for wound-rotor induction motors is:

$$R = \frac{E_s}{1.73 \times I_s} \times \left(\frac{100}{T_1} - 0.10\right)$$

Where R is the external resistance per phase of the Y, in ohms; E_s the locked secondary volts; I_s the full-load secondary current; T_1 the torque developed on first point of the controller expressed in percent of full-load torque.

Based on this formula, resistance values are obtained that give smooth acceleration up to the last point of the controller. Secondary resistors for slipping motors are usually Y-connected, although the delta connection may be used to reduce the current handled by the contact fingers. If the resistors are delta-connected, determine the proper value for Y-connected resistors and convert to an equivalent delta. E J Kelley, Kansas City, Missouri.

Grid-Resistor Values In Terms of Slip

ROTOR GRID RESISTORS for slipring motors are designed for *starting only* as well as *starting and speed regulation*. Both types are generally designed for starting under various loads.

It appears that *JHV's* resistor is designed for a larger starting load than actually exists. If his motor is larger than necessary, the rotor current and the slip will be smaller than calculated. The rotor-control equipment will not work properly unless designed for the lighter load. This is especially important where regulation is required.

Let the resistance per phase of rotor winding equal X ohms. Slip at full load is:

$$S = \frac{1200-1150}{1200} = 0.0417$$

Slip for ¾, ½ and ¼ load can be determined from the motor's circle-diagram if available; it can be approximated as directly proportional to the load for zero to full load.

Hence, slip at ¾, ½ and ¼ load equals 0.031, 0.021 and 0.010, respectively. Total resistance per phase in the rotor circuit, including the existing resistance X, is

$$R_o = \frac{X}{S}.$$

Number of steps in the rheostat is N, and in this case 12. The slip at the first step is given by

$$S_1 = \sqrt[11]{S} = 0.77.$$

Since

$$R_1 = \frac{X}{S}$$

then $R_o = 24\ X$ ohms. Value of each