

Engineering News



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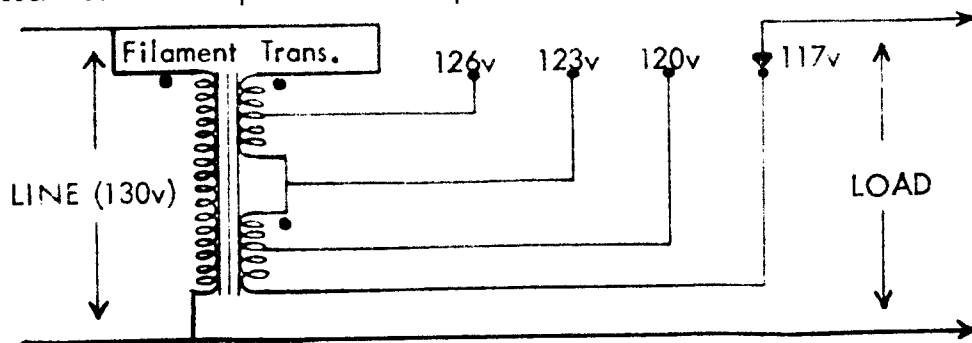
LINE VOLTAGE COMPENSATION

Technical Letter No. 122

The voltage at which power is delivered to electronic equipment represents an ever-increasing concern to the contractor; this is true, in part, because power companies -- especially those in urban areas -- have embarked upon a program of raising the nominal voltage above the nominal 117 volt level, standard for so many years. Although most equipment is designed to operate over a range of input voltage, continuous exposure to a value greater than the nominal drastically reduces the operating interval before service is required. Conversely, certain rural regions tend to experience a decrease in power line voltage (below the nominal 117) resulting in impaired performance at low voltage.

Engineering contractors -- providing service on a contractual basis -- together with those actually using the equipment, are conscious of the high cost of premature electronic failure (from excessive voltage), or poor and inefficient performance (from too low a voltage). In order to prevent either of these malfunctions, many engineers and contractors are checking voltages at new installations and installing line voltage correcting transformers (such as the Variac) to re-establish the nominal 117 volts.

While methods such as the foregoing are often relatively expensive and involve large, heavy transformers, the method described below represents an inexpensive means to achieve the desired result -- in a minimum of space:



In practice, a filament transformer is selected which has a secondary voltage equal to the difference between actual and desired line voltage. The current rating of the secondary must equal or exceed the load current.

The sketch above shows a fairly universal arrangement, using a transformer having two 6.3 volt center-tapped secondaries. The "dot" markings indicate relative winding phase. If the transformer has no phase markings, experimentally connect the two secondaries in series with a voltmeter across the combination, in order to determine that the voltages are additive; if not, reverse one pair of leads. Should the combination provide an increase in line voltage when a decrease is wanted, reverse the primary leads.