

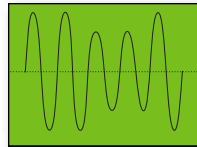
## constant voltage transformers

### power quality program

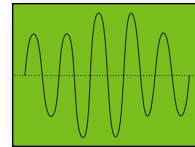
Ferroresonant transformers

Voltage regulators

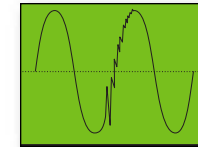
Constant voltage transformers are used to eliminate:



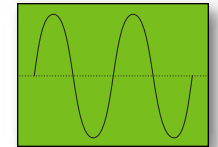
voltage sags,



swells and



transient voltage disturbances on the incoming power, and



provide a constant output voltage

# ferroresonant transformers voltage regulators

What to look for when purchasing a Constant Voltage Transformer:

### CONSTANT VOLTAGE TRANSFORMERS

#### Ferroresonant Transformer

- Range of voltage regulation
- Current rating
- Other protection?
- Is isolation provided?

#### Voltage Regulator

- Range of voltage regulation
- Current rating
- Other protection?
- Is isolation provided?
- Response time
- Is tap changing done at the zero current crossing?

Constant voltage transformers will not protect against momentary or longer-term power outages.

Two types of constant voltage transformers are typically recommended:

#### ferroresonant transformers

Specially designed transformers which maintain a constant output voltage during periods of varying input voltages. Although they are less efficient than standard transformers, they are very reliable since they contain no moving parts. Ferroresonant transformers are typically shielded so they are useful in eliminating common mode noise problems. These units should be oversized if they are used to power switched loads, since equipment inrush (starting) currents will distort the transformer's output voltage. In some cases, filtering may also be required to eliminate low order harmonics to provide an undistorted sine wave output.

#### advantages

- Normally provide isolation.
- No moving parts.
- Built in surge and short circuit protection.
- One cycle response time (approx. 15 milliseconds).

#### disadvantages

- Square wave output (i.e., harmonics).
- Voltage distortion during inrush currents.
- Less efficient.
- Can be noisy.

#### recommended uses

Computers, PLC's and other microprocessor-based equipment with steady power requirements.

## ferroresonant transformers

#### voltage regulators

Tap changing transformers which adjust for input voltage variations by automatically changing taps on a power transformer. The number of taps available determines the voltage range over which regulation is provided. These units are more efficient than ferroresonant transformers and are able to handle inrush currents without distorting the output voltage waveform. The new solid state voltage regulators utilize electronic sensing and switching techniques to provide voltage correction within 3-5 cycles (50-80 milliseconds). Although units with faster correction times are available, these units may generate switching transients since the tap changing is typically done at points other than the zero current. Older models, which utilize electromechanical sensing and switching, are not capable of providing the fast response required for today's sensitive electronic equipment.

#### advantages

- More efficient.
- Can handle inrush currents and switched loads with little distortion.
- Sine wave input.

#### disadvantages

- Normally does not provide isolation.
- Has moving parts.
- Normally do not provide short circuit protection, surge protection, etc.
- Slower response time.

#### recommended uses

Computers, PLC's and other microprocessor-based equipment with varying power requirements.

## voltage regulators