

Detecting Unbalanced Load Current in Motors

During normal operation, the motor load current for a three-phase system is balanced. Any unbalanced loading is a symptom of abnormal operating conditions caused by problems such as bearing failures or uneven clearances that allow the motor rotor to touch the stator. This causes motor vibration and overheating that may eventually cause insulation failure of the motor windings, costly repair and significant downtime during replacement.

The model 272 three-phase current unbalance detector monitors three-phase lines to detect an unbalanced current. It can also monitor three separate single-phase lines for equal current levels.

The percentage of unbalance is adjustable from 2% to 25% by adjusting a front panel control. An unbalance greater than this setting energizes the relay that will disconnect the motor connections and avoid any further damages.

The formula for an unbalance is:

$$\frac{(\text{Max. Current} - \text{Min Current})}{\text{Max. Current}} \times 100 = \%$$

An adjustable trip delay of 0.5 to 10 seconds is also provided and can be adjusted to the required time setting. For optimum performance, operating currents should be kept in the 1-5A range. Continuous currents up to 10A per phase will not damage the unit nor will current surges up to 40A for 2 seconds. The contacts are automatically reset when the unbalanced condition is corrected.

A supply voltage of 24Vac or 120Vac is required for the operation of the unit.

Related models

- [Model# 272 Current Unbalance Detector](#)