

THD vs TDD

Total harmonic distortion (THD) and total demand distortion (TDD) are terms used in the context of electrical systems and power quality. Both describe the undesirable effects of harmonics, but they address different aspects.

Definitions:

Total Harmonic Distortion – Total harmonic distortion, or THD, is a measure of the harmonic content present in a signal compared to its fundamental frequency. In an electrical system, the fundamental frequency is the typical standard power frequency (e.g. 50 or 60Hz).

Total Demand Distortion – Total demand distortion, or TDD, is a measure of the distortion of the current waveform caused by nonlinear loads in a power system over a specified time period. TDD accounts for both the magnitude and phase angle distortion of the current waveform from the ideal sinusoidal waveform.

Focus:

THD focuses on the harmonic content in voltage or current waveforms. It considers the instantaneous quality of the signal. TDD addresses the distortion in the current waveform caused by nonlinear loads over a specified time interval. It accounts for variations in distortion levels and their impact on the power system over time.

	Total Harmonic Distortion (THD)	Total Demand Distortion (TDD)
Focus	<ul style="list-style-type: none"> • Harmonic distortion and its effect on purity of the waveform • Instantaneous quality of a signal 	<ul style="list-style-type: none"> • Broader perspective considering distortion over a specified time interval • Accounts for variations in distortion levels and impact on power systems over time
Time Frame	<ul style="list-style-type: none"> • Short time frame • Instantaneous distortion 	<ul style="list-style-type: none"> • Extended time period • Demand intervals such as 15, 30, or 60 minutes
Units	<ul style="list-style-type: none"> • Percentage of total harmonic content relative to the fundamental frequency 	<ul style="list-style-type: none"> • Percentage and considers both fundamental and harmonic distortion components
Application	<ul style="list-style-type: none"> • Used in assessing power quality in systems where harmonic distortion can have immediate adverse effects 	<ul style="list-style-type: none"> • Applied where long-term distortion effects on a system needs to be considered
Mitigation	<ul style="list-style-type: none"> • Use of filters, transformers, and other devices designed to reduce harmonic content 	<ul style="list-style-type: none"> • Load balancing, power factor correction, and other measures aimed at improving overall power quality