

Voltage sag

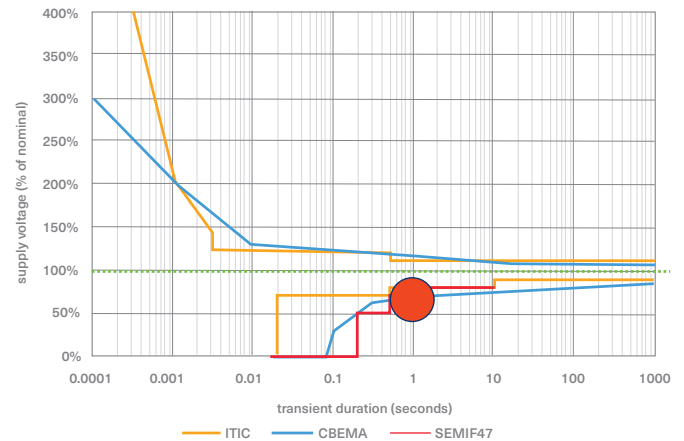
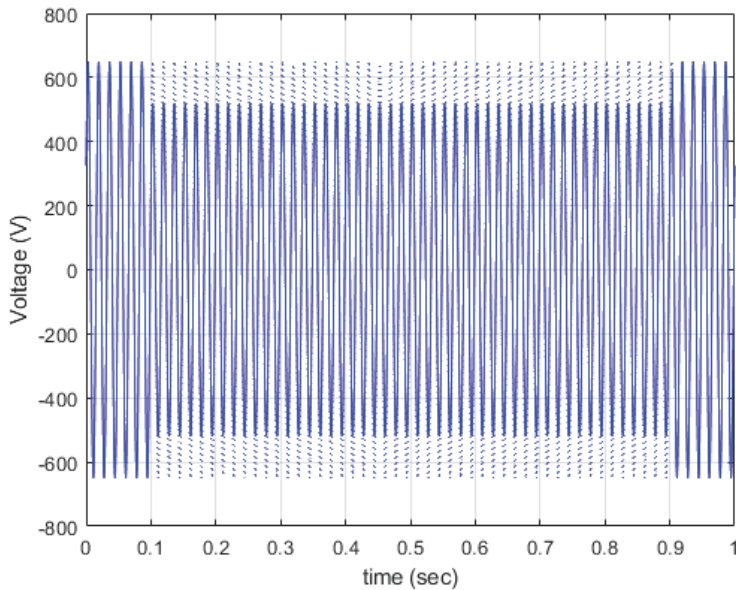
The example waveform in Figure 9 shows a 0.8 second voltage sag, down to 80 percent nominal voltage. RMS trend data can be used to capture longer duration voltage sags, but not shorter duration (< 1 second).

Causes: Line starting a large induction motor, fault conditions, or poor generator voltage regulation

Effects: Very short duration voltage sags may go unnoticed. Longer voltage sags (> 1 second) may cause control voltage to drop out of range, resulting in undervoltage transients. Line connected motors may experience higher current and lower power factor during voltage sag conditions.

Potential solutions: If the voltage sag is due to high inrush current when starting a motor, the inrush current can be reduced with a reduced voltage starter, soft starter, or VFD. If the voltage sag is due to upstream power supply, contact the utility provider or generator manufacturer.

Figure 9. Example of a voltage sag waveform



Voltage swell

The example waveform in Figure 10 shows a 0.8 second voltage swell, to 120 percent of nominal voltage. RMS trend data can be used to capture longer duration voltage swells, but not shorter duration (< 1 second).

Causes: Utility or generator voltage regulation issues

Effects: While the magnitude of voltage swells is not as high as voltage spikes, the longer duration of voltage swells results in damage potential. Voltage swells are particularly stressful on capacitors inside VFDs and control power supplies.

Potential solutions: Contact the utility provider or generator manufacturer.

Figure 10. Example of a voltage swell waveform

