Motors with base rating voltage $V_{rated} \leq 600$ volts:

$V_{peak} \leq 1$ kV rise time ≥ 2 µs

See Figure 30-5 for a typical voltage response at the motor terminals for an illustration of V_{peak} and rise time.

Motors with base rating voltage $V_{rated} > 600$ volts: $V_{peak} \leq 2.04 * V_{rated}$

Rise time ≥ 1 µs

Where:
V_{peak} is a single amplitude zero-to-peak line-to-line voltage.

CAUTION—When the input voltage to the control exceeds the rated voltage, care must be taken in determining the maximum peak voltage (V_{peak}) that will be applied to the motor by the control.

For suitability when values are outside these limits, contact the manufacturer for guidance. A definite purpose motor per Part 31 may be required. Filters, chokes, or other voltage conditioning devices applied with guidance from the control manufacturer may also be required.

30.2.2.9 Power and Coupling Capacitors

The use of power capacitors for power factor correction or surge suppression on the load side of an electronic control connected to an induction motor is not recommended. The proper application of such capacitors requires an analysis of the motor, electronic control, and load characteristics as a function of speed to avoid potential overexcitation of the motor, harmonic resonance, and capacitor overvoltage.

The use of coupling capacitors, typically less than 200 pF, for partial discharge (PD) detection on the load side of an inverter connected to an induction motor is generally acceptable. The proper application of such capacitors requires an analysis of the motor, electronic control, and load characteristics as a function of speed. Additional hardware may be required in the terminal box to take PD measurements.

30.2.2.10 Operation in Hazardous (Classified) Locations

WARNING—Motors operated from adjustable frequency or adjustable voltage power supplies or both should not be used in any Division 1 hazardous (classified) locations unless the motor is identified on the nameplate as acceptable for such operation when used in Division 1 hazardous (classified) locations.

For motors to be used in any Division 2 hazardous (classified) locations, the motor manufacturer should be consulted.

Failure to comply with this warning could result in an unsafe installation that could cause damage to property or serious injury or death to personnel, or both.

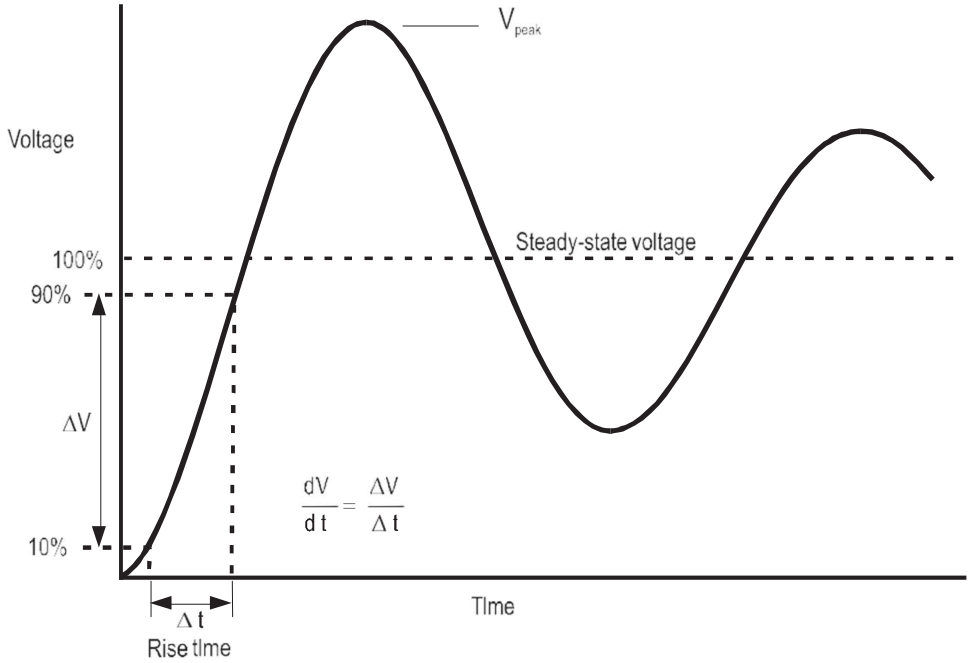

Figure 30-5
Typical Voltage Response at Motor Terminal