Question:
What is the voltage rise-time of my Baker Instrument Surge tester?

Answer:
Voltage rise-time is defined as the time for a voltage signal to change from 10% to 90% of crest, or peak value. Sometimes called switching time. Explained at length in IEEE Std 522-1992.

D6/12R: .1 - .2 micro-second on formed coils.
.1 - .2 micro-second on most stators and assembled motors, voltage rise-time does not vary due to D6/12R surge generator characteristic. Meets IEEE 522 rise-time specification.

D15/65R: .1- .2 micro-second on formed coils.
.1 - .2 micro-second on most stators and assembled motors, voltage rise-time does not vary due to D15/65R surge generator characteristic. Meets IEEE 522 rise-time specification.

Advanced Winding Analyzer series 2 and 3: .1- .2 micro-second on formed coils.
.1 - .2 micro-second on most stators and assembled motors, voltage rise-time does not vary due to AWA surge generator characteristic. Meets IEEE522 rise-time specification.

PP130/230/D30000/D185/D285 series: .1 - .2 micro-second on formed coils.
.1 - .2 micro-second on most stators and assembled motors, voltage rise-time does not vary due to surge generator characteristic. Meets IEEE 522 rise-time specification.

D6000/12000/DS206/212: .1 - .2 micro-second to 1.0 – 1.5 microsecond on formed coils (dependent on voltage impressed across surge generator), .2 - .3 micro-second to 1.0 – 1.8 microsecond on most stators and assembled motors. (dependent on voltage impressed across surge generator, higher voltages have faster rise-times)

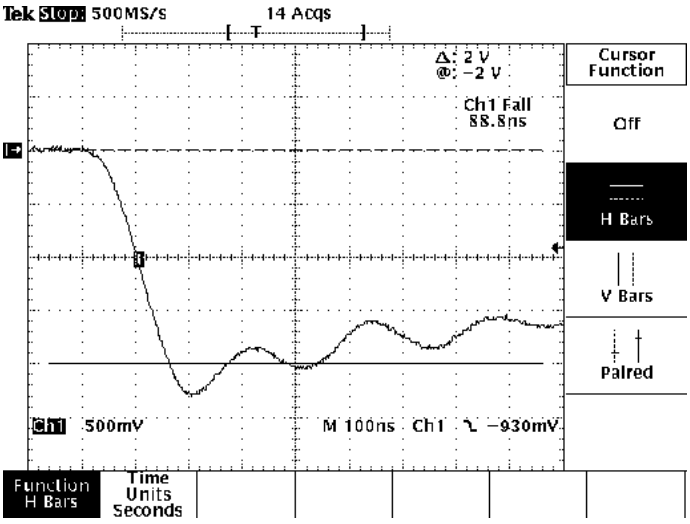
D150000/DS215/D165/DS265: .1 - .2 microsecond to 10. – 2.0 microsecond on formed coils (dependent on voltage impressed across surge generator), .2 - .3 micro-second to 1.0 – 2.0 microsecond on most stators and assembled motors. (dependent on voltage impressed across surge generator, higher voltages have faster rise-time)

ST103/203/106/206/112/212 A, E and R series: .1 - .2 micro-second to 1.0 – 1.5 microsecond on formed coils (dependent on voltage impressed across surge generator), .2 - .3 micro-second to 1.0 – 1.8 microsecond on most stators and assembled motors. (dependent on voltage impressed across surge generator, higher voltages have faster rise-times)

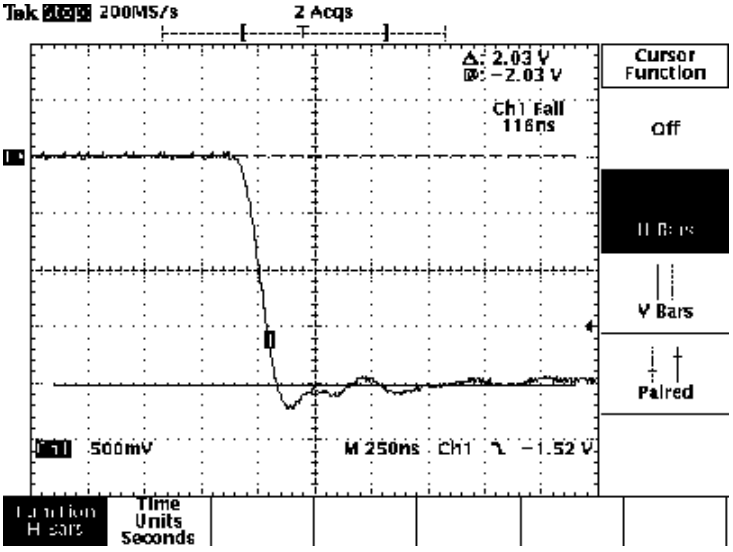
ST115/215/165/265 E and R series: .1 - .2 microsecond to 10. – 2.0 microsecond on formed coils (dependent on voltage impressed across surge generator), .2 - .3 micro-second to 1.0 – 2.0 microsecond on most stators and assembled motors. (dependent on voltage impressed across surge generator, higher voltages have faster rise-time)

ST124/224/174/274 E and R series: .1 - .2 microsecond to 10. – 2.0 microsecond on formed coils (dependent on voltage impressed across surge generator), .2 - .3 micro-second to 1.0 – 2.0 microsecond on most stators and as**sembled motors. (dependent on voltage impressed across surge generator, higher voltages have faster rise-time)**

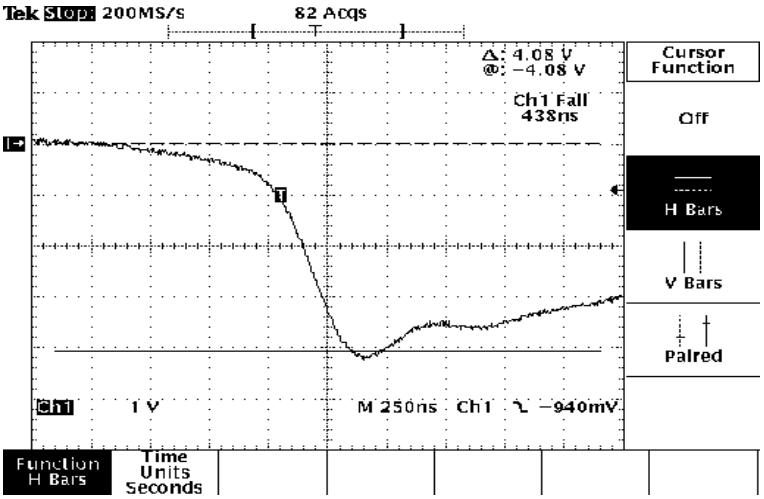
Example wave forms:
Waveforms were captured with Tektronix P6015 1000:1 high voltage oscilloscope prope and Tektronix TDS360 Oscilloscope
This plot shows Baker Instrument D12R tester impressing 2000 volts across a 7 turn formed coil, with a switching time of 88.8 ns, meets IEEE 522-1992



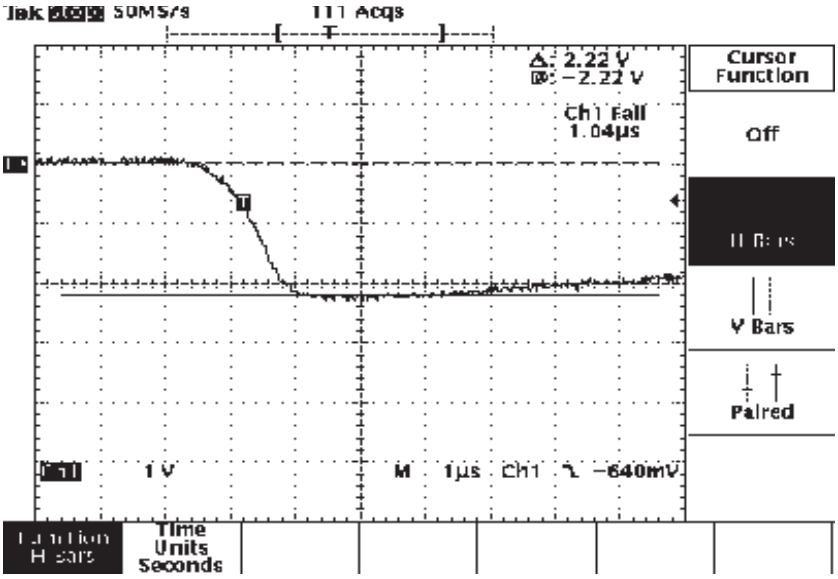
This Plot shows Baker Instrument D12R impressing 2000 volts across the T1 –T3 terminal leads of a 70 HP 400VAC 50HZ Stator. Switching time is 116 ns. Meets IEEE522-1992



This plot shows a Baker Instrument D165 impressing 4000 volts across a 7 turn formed coil. Switching time is 438 ns.



This plot shows the Baker Instrument D165 tester impressing approximately 2000V across the T1 – T3 terminals of the 70 HP 400VAC 50HZ stator. Switching time is 1.04 micro-seconds.



Summary:

As shown from the examples, the D12R is compliant with IEEE522 for switching time of .1 -.2 microseconds (100-200 nano-seconds) Large motors and generators with significant capacitance will slow the impressed rise-time slightly.

The D6/12R, D15/65R, Advanced Winding Analyzer, PP130/230/D30000/D185/D285 are all IEEE522 compliant.

The D165R has a rise-time that varies according to the voltage desired, the higher the target voltage, the faster the D165 surge generator applies the voltage. The switch technology used in the D165R is capable of meeting IEEE 522 at elevated voltage levels.

The ST 103/203/106/206/112/212/124/224 A, E, R series, D6000/D12000/DS206/DS212, D15000/DS215/D165/DS265, use the same surge generator technology and respond roughly the same way.

The lower voltage rated testers switch faster, due to fewer elements in their surge generator circuits. In other words, a ST103E will switch faster at 2KV than a ST124 will.