RaySafe X2 versus RaySafe Xi – mA measurements

BACKGROUND

The RaySafe X2 measures mA differently than the RaySafe Xi. This difference can result in significantly different measurement results depending upon the X-ray machine's waveform, the RaySafe Xi's trig level setting, and the RaySafe Xi's mode of operation.

Note: Whenever RaySafe Xi is mentioned in this application note, the information is also applicable for the RaySafe Solo.

RAYSAFE X2 mA MEASUREMENTS

The RaySafe X2 calculates mA as an average of all samples above 50% of peak. Rush currents are automatically removed. Intermediate readings are based on samples since last reading. For long measurements, the final reading is recorded approximately 1 to 2 seconds prior to the end of the exposure.

The RaySafe X2 is polarity independent so it can measure both positive and negative signals.

RAYSAFE Xi mA MEASUREMENTS

The RaySafe Xi measures mAs, then calculates mA by dividing the mAs by the exposure time, which means that the average mA is displayed. If the exposure is longer than 6 seconds, the displayed mA is that which is calculated as a two-second running average approximately 2 seconds prior to the end of the exposure.

For radiographic exposures, the mA calculation is directly dependent on the exposure time measurement, so most inaccurate mA calculations result from inaccurate exposure time measurements.

The RaySafe Xi is polarity dependent and measures only a positive signal.

COMPARISON

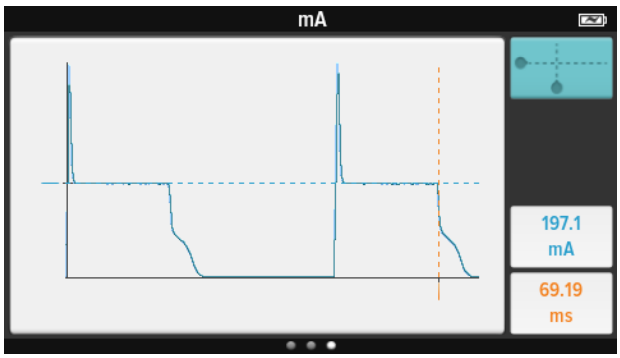

Figure 1. How RaySafe X2 measures mA, the stable mA value.

Figure 1 shows an mA waveform as measured by a RaySafe X2. Because the RaySafe X2 calculates mA using only samples above 50% of the peak, excluding rush currents,

it measures on the plateau as depicted by the blue, dashed line. In this example, the RaySafe X2 measured 197.1 mA.

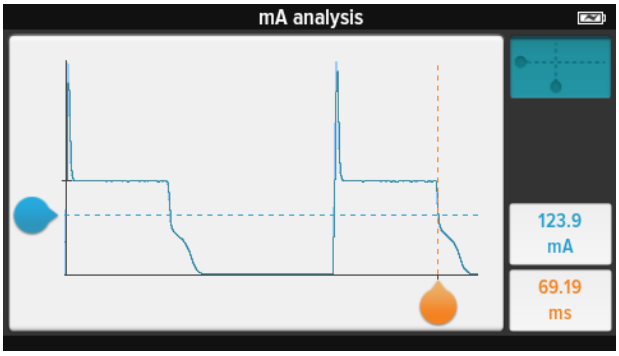

Figure 2. How RaySafe Xi measures mA, the average mA value.

Figure 2 shows how the RaySafe Xi, and most competitors' meters, would calculate mA on the same waveform in the previous example. The RaySafe Xi would display 123.9 because it calculates the average mA as depicted by the blue, dashed line.

CONCLUSION

Because the RaySafe X2 can capture and analyze and exposure's entire mA waveform, it can measure the true generator mA, unlike other instruments, including the RaySafe Xi, that can only display an average mA. Using the RaySafe X2 will enable you to more accurately adjust mA; however, if you need to measure average mA, you can, of course, divide the mAs reading by the measured exposure time.

$$average\ mA = \frac{mAs}{time}$$

CONTACT

Please visit http://www.raysafe.com for more information.