APPLICATION NOTE

Measuring on Sectra/Philips MDM L-series

This application note contains recommendations on how to position the MPD or Piranha when performing QA tests on a Sectra/Philips MDM L series.

Introduction

Philips has a series of mammography units, MDM L series, formerly known under the brand of Sectra. The L series of mammography units has a number of narrow beams that are scanning over the image area. When the MDM L30 unit was released it differed from earlier version by having a stabilizer in the pre-collimators. Theses stabilizers give the effect that the radiation varies over the irradiated surface. Also the spectra vary over the surface due to the attenuation caused by the stabilizers.

The Piranha with its small and narrow detector design can detect this variance. But it is also essential to be aware of this when using the Piranha, and position the Piranha correctly. Formerly RTI recommended positioning the Piranha with the USB port in the 12 o'clock position. That positioning is ideal for the most accurate kVp reading. However, after introducing the Quick HVL for the Piranha we do recommend to position the Piranha with the USB port in the 9 o'clock position (to the left).

Measure kV, dose and Quick HVL

If the Piranha or MPD is calibrated for beam quality W/0.5 mm Al (M7) it will work fine to measure kV, dose and Quick HVL on the L30 model.

1. Position the meter as shown in figure 1. The centre of the white detector area of the Piranha/MPD should be positioned at a distance from the chest wall as stated by local recommendations.

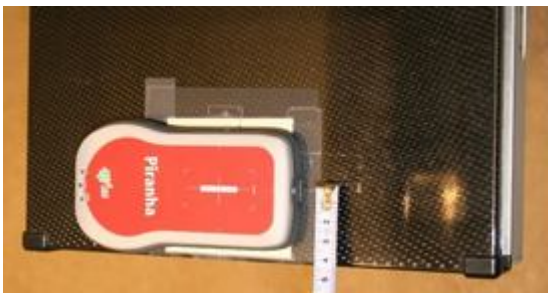

Figure 1. Detector positioning for Quick HVL measurement

By placing the meter this way, the internal diodes, which are positioned along the white detector area, will be irradiated by the same output, dose wise and spectral wise, as the beam sweeps past the meter.

2. It is important to place the meter in such a way that the result from the "position check" gets very close to 1.00. If the reading is off, check the positioning of the Piranha. First check that the detector area is aligned perpendicular to the chest wall.

3. Once the positioning is done you are ready to start the measurements.

Note that the dose and HVL will differ depending on the distance from the chest wall. Not only due to heel effect, but also due to the variance in radiation output as described in this application note. The 15% difference in radiation output depends on a variation in attenuation, and thereby also the HVL is affected.

Measure kV and dose only

If not using the Quick HVL it is advantageous to position according to our former recommendation, i.e. with the USB port in the 12 o'clock position. That positioning is ideal for the most accurate kVp reading.

1. Position the meter as shown in figure 2, below. The centre of the white detector area of the Piranha/MPD should be at approximately 60 mm from the edge of the table.

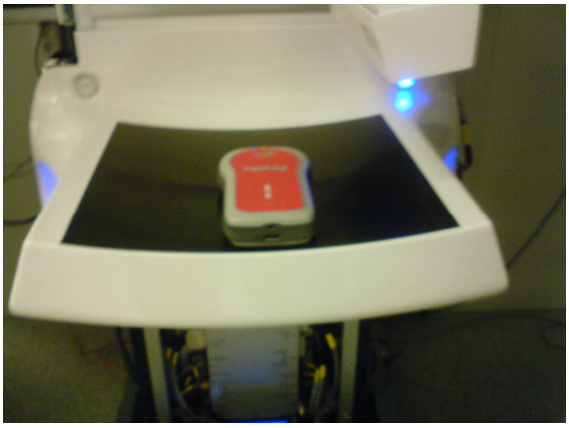

Figure 2. Detector positioning if Quick HVL is not used.

By placing the meter this way, with the long edge aligned with the anode-cathode direction, the internal diodes, which are positioned along the white detector area, will be irradiated simultaneously as the beam sweeps past the meter.

2. It is important to place the meter in such a way that the result from the "position check" gets very close to 1.00. If the reading is less than 1.00, move the meter a little bit from the edge of the table and if the reading is larger than 1.00, move the meter a little bit towards the edge of the table. Be careful when moving the meter, 2 mm corresponds to a change in 0.1 in the position check read-out.

3. Once the positioning is done you are ready to start the measurements.

Note: If you want to measure HVL using layers of Al filters, measuring dose in the traditional way with the Piranha, one has to use the applications delivered by RTI for making energy compensation of the dose values. Applications and templates for that is available in the RTI Handheld QABrowser and in the PC software Ocean.

What is special with the MDM L30?

The output from the L30 varies from the chest wall as figure 3 shows. The signal output is very close to a sinus waveform with 5 mm between maximum and minimum, where the dose at the maximum to its minimum differs about 15 % (i.e. 7.5 % from dose average).

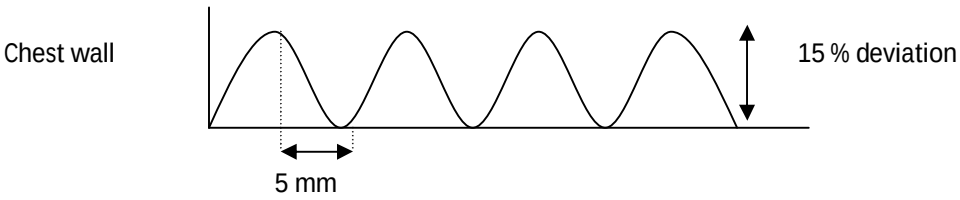

Figure 3. L30 signal output

Since the Piranha internal detector is only about 3 mm wide, it will detect this 15 % deviation if moved in small steps in the direction from or against the chest wall (along the sinus wave of the signal shown in figure 3 above).

*** END ***