



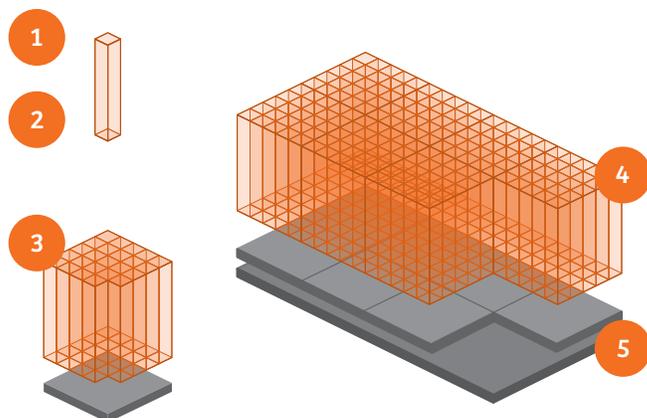
Biograph Vision

See a whole
new world of
precision

Introducing Biograph Vision

At Siemens Healthineers, we were inspired to make breakthrough improvements in PET/CT. Biograph Vision™, featuring Optiso Ultra Dynamic Range (UDR) detector, introduces the first silicon photomultiplier (SiPM)-based detector with 3.2-mm LSO crystals¹ and 100% coverage², resulting in a cascade of health and efficiency benefits.

Transcend digital with the Optiso UDR Detector



1. LSO, a fast and efficient scintillator, is grown and cut in-house through a vertically integrated manufacturing process to ensure the highest quality.
2. 3.2-mm crystal elements are individually selected and deliver high isotropic spatial resolution; higher spatial resolution may result in improved lesion detectability.
3. 100% coverage² of the crystal area with SiPM sensors results in a timing resolution of 214 picoseconds² and 3.9 times higher effective sensitivity³ for faster scans and lower dose.
4. A small block size delivers 1870 kilo counts per second² effective peak NECR for improved clinical performance.³
5. High-flow direct-cooling of the detector plate allows the detector to operate at room temperature² for outstanding performance, serviceability and improved patient comfort.

What is UDR?

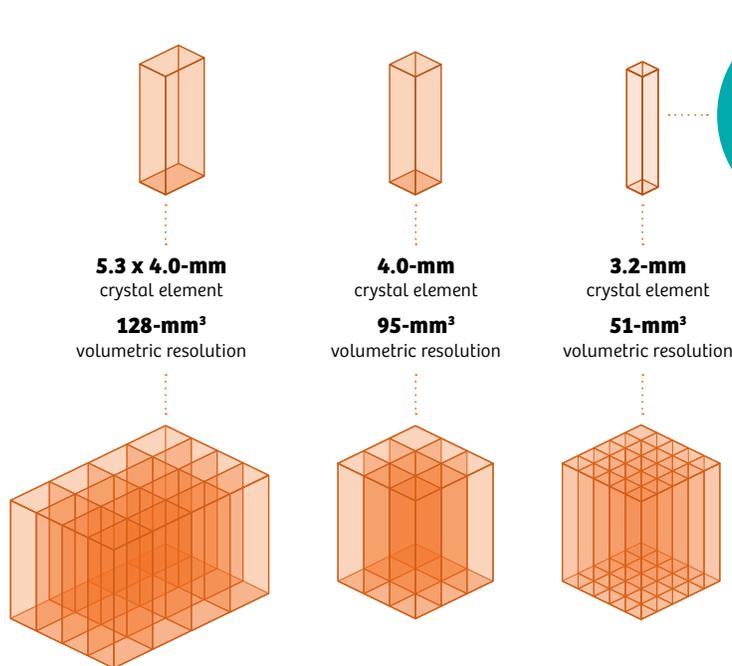
The new Optiso UDR detector uses multiple technologies to provide optimal performance in a wide range of count rates. The fastest time-of-flight¹ and high effective sensitivity provide excellent performance in low- and medium-activity ranges such as ⁹⁰Y, ¹⁸F and ⁶⁸Ga applications. A small block detector with low deadtime makes it suitable to operate in the high-activity concentrations found in studies with very short-lived tracers, such as ⁸²Rb and ¹⁵O.

Small crystal, big impact

- 3.2-mm crystals
- 214-ps time-of-flight²

3.2-mm crystals for high spatial resolution

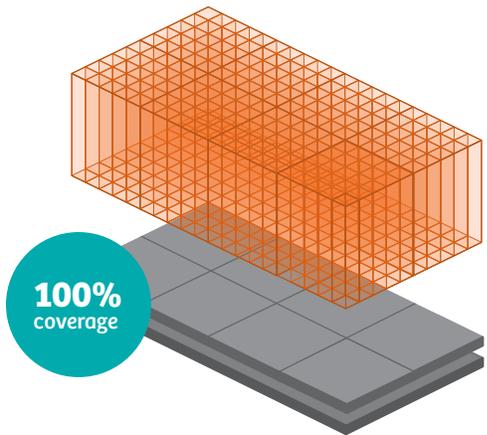
High spatial resolution improves small-lesion detectability. Reducing crystal size improves spatial resolution.



60%
Better volumetric resolution¹

The first PET/CT with 100% coverage^{1,2} of the scintillator area, leading to the fastest time-of-flight.¹

Time-of-flight performance depends on collecting light from all photons in the scintillation. Biograph Vision is designed so SiPMs cover the entire LSO-array area, allowing all light from the scintillation to be detected. This leads to 100% coverage² and enables fast temporal resolution.²



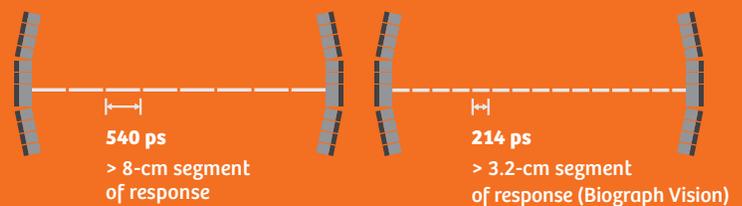
No TOF

540-ps TOF

214-ps TOF

Better time-of-flight and improved detector capabilities reduce noise. Less noise means greater image clarity, making small lesions easier to find.

Left and middle image acquired on Biograph™ mCT.
Right image acquired on Biograph Vision.



Fast time-of-flight enables smaller segments of response. This improves the signal-to-noise ratio.

Optimally designed for clinical use

1. Large bore with 25% more space than industry standard¹

A 78-cm bore and 227-kg (500-lb) table capacity supports the study of a broad patient population and enables a more comfortable patient experience.

2. Ambient temperature

High-flow direct-cooling of the detector plate eliminates the need for noisy fans, dehumidifiers, and overly cold air conditioning.

3. Exclusive bed design

Zero differential deflection of the patient bed between the PET and CT fields of view enables precise registration for accurate attenuation correction. It also allows TG-66 compliance for radiation therapy.

4. Short tunnel

136-cm tunnel improves patient comfort and facilitates patient positioning.

5. Bed-integrated physiological inputs

Integrated physiological inputs and IV support provide a clutter-free work environment and simplify patient positioning.

6. Optional software available

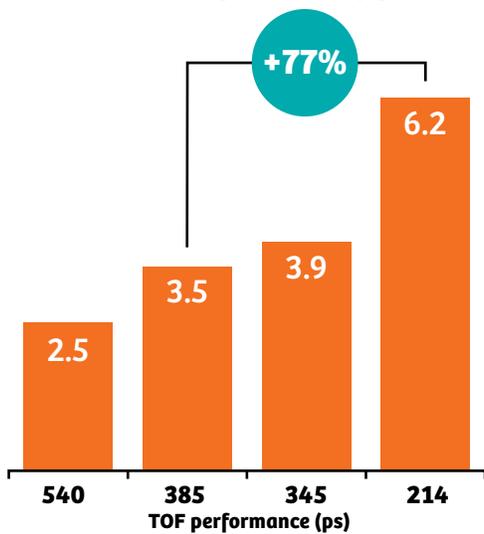
Optional software expands clinical capabilities to a greater number of patients and improves workflow.



Highest effective sensitivity of 100 cps/kBq

Biograph Vision has the market's highest effective sensitivity of 100 cps/kBq.¹ The small block size delivers low deadtime even at high count rates, allowing the system to operate at very high activity concentrations. With 3.9 higher effective sensitivity³, it enables scan time and injected dose to be significantly reduced.

Time-of-flight sensitivity gain



214-ps timing resolution for faster time-of-flight³ and better effective sensitivity.³ Gain is calculated for a 20-cm cylindrical phantom.

High-contrast recovery with low variability

The combination of improved resolution and effective sensitivity helps you better understand disease progression. The high resolution reduces partial volume effect, increasing the recovery, particularly for the small structures. Time-of-flight reduces the noise and variability, resulting in accurate and reproducible quantitative values.

Results from NEMA image quality measurements

	Diameter	Contrast	Variability
Hot	10	90.9%	9.8%
	13	78.7%	7.7%
	17	90.1%	5.8%
	22	91.8%	4.6%
Cold	28	88.2%	3.8%
	37	90.9%	3.1%

Contrast recovery is the ratio between the measured and real values in the NEMA image quality phantom. Biograph Vision delivers high-contrast recovery for all sphere sizes.²

Faster time-of-flight, more reproducible quantification

Time-of-flight provides more accurate quantitative values, with better contrast, particularly for small structures. Even at very low doses, the accuracy and reproducibility of the quantification is better when time-of-flight is used, and its benefits improve with faster timing resolution.

Biograph Vision's timing resolution of 214 ps² delivers accurate and reproducible quantitative values.

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siemens.com/vision

References:

1. Based on competitive literature available at time of publication. Data on file.
2. Based on internal measurements available at time of publication. Data on file.
3. Compared to current state-of-the-art technologies. Data on file.

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