



# Advancing imaging in Electrophysiology

**KODEX-EPD system for cardiac imaging and mapping**

**EPD**  
**Solutions**  
A Philips company

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# Introduction

Despite advances in imaging and mapping technologies for Electrophysiology (EP), physicians are still encountering difficult challenges when performing interventions like Cryo and RF ablations. The new KODEX-EPD system is an open platform that works with any qualified EP catheter and uses dielectric imaging to give physicians new insights to guide their interventions. It has been developed to address key unmet needs in EP procedures today. It is a completely new approach to cardiac imaging that shows real-time HD imaging delivering true anatomy and creates voltage and activation maps.

KODEX-EPD uses dielectric sensing to build anatomy, discriminate cardiac structures, and assess tissue properties. Dielectric imaging creates high-definition 3D images of a patient's cardiac structures in real-time, without using ionizing radiation or contrast media. This technology overcomes many limitations of the current technologies and offers benefits for both Cryo and RF ablation procedures. It has the potential to provide new insights into complex cardiac structures to greatly simplify navigation and therapy delivery. Discover how the KODEX-EPD system can enhance your procedural efficiency and patient care.



See **true anatomy** without radiation



**Personalize therapy** based on intraprocedural insights



Simplify your workflow for **more efficient procedures**



Optimize your **quality of care**

The KODEX-EPD system provides real-time, high-definition imaging that visualizes true anatomy during EP procedures. No ionizing radiation or contrast medium is required with this technique. These images show variations in cardiac anatomy including accessory veins that might otherwise be missed using conventional mapping systems.

The PANO shows all relevant structures in one overview to enhance understanding of 3D anatomy, enabling catheter navigation in an intuitive way. It may also assist in distinguishing anatomical nuances like LAA and ridge morphologies. In addition, the glass view gives an improved perception of 3D catheter location and orientation within the heart. The system does not need a locational reference point, and is free from some of the limitations of existing magnetic technologies like artifacts due to distortions from metal objects in the field.

KODEX-EPD visualizes patient-specific anatomical details with excellent clarity, such as the fossa ovalis, pulmonary veins, LAA and eustachian ridge to allow personalized therapy planning and delivery. It may also assist clinicians in identifying PFOs during cardiac imaging in EP procedures.

The multi-chamber view helps to understand the relative positions of adjacent chambers as well as the structures between two chambers.

The system provides accurate navigation using any standard qualified catheter. In parallel, it creates continuously updated voltage and activation maps to support efficient collection of additional insights and confirm therapy impact.

The KODEX-EPD system supports the Medtronic Cryoablation procedure. Dielectric imaging visualizes the pulmonary veins to determine size, shape, trajectory and helps in identifying the location of the ostium using any qualified ablation or mapping catheter, including the Medtronic Achieve™ Mapping Catheter.

Every aspect of this system is designed to save you time during EP procedures. KODEX-EPD provides detailed 3D anatomy in as little as 3 minutes. The system is easy to set up for fast EP lab turnover and the user interface is very intuitive. KODEX-EPD offers a streamlined workflow with very little need to correct for physiological distortions or patient movement, compared to magnetic or impedance-based systems. The panoramic PANO reduces the need for image maneuvering.

This new imaging modality offers many ways to support you in optimizing the quality of care for your patients. The system is an open platform so you can choose your preferred ablation method, like RF or Cryo, and use any qualified EP catheter to provide the optimal treatment for each individual patient.

Dielectric imaging does not use ionizing radiation and contributes to reducing the overall X-ray exposure to patients and staff. This technique is patient friendly as it uses no contrast medium and reduces the need for pre-procedural CT/MRI images.

During Medtronic Cryoballoon ablation procedures, the KODEX-EPD system with its Occlusion Viewer provides an assessment of pulmonary vein occlusion, reducing the dependency on X-ray, by utilizing dielectric sensing with the Medtronic Achieve™ Mapping Catheter.<sup>1</sup>



Figure 1: Left atrium showing an accessory right middle pulmonary vein (RMPV) in 3D posterior view adjacent to an anterior PANO.

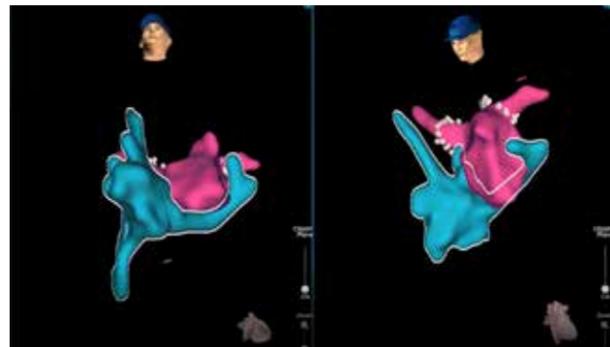


Figure 3: 3D Multi-chamber view of the left and right atria showing CS extending around LA with RF ablation tags visible.

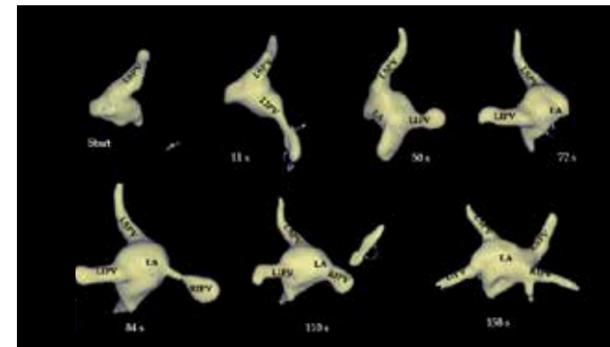


Figure 5: Example showing how KODEX-EPD builds up a detailed 3D image of the left atrium in as little as 3 minutes.

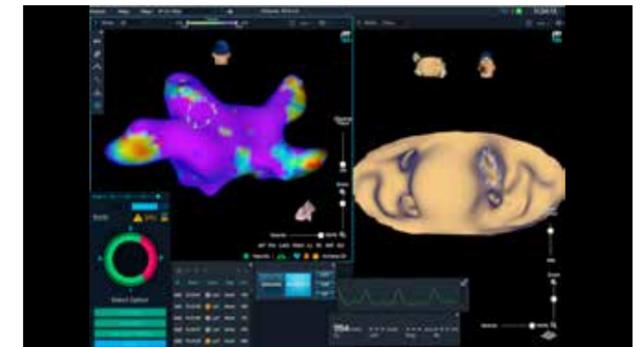


Figure 7: Balloon Occlusion Viewer using Baseline Assessment, assists with initial balloon positioning within the PV ostium.



Figure 2: 3D glass view of the 3D right atrial image with a well-defined ablation line along the CTI.

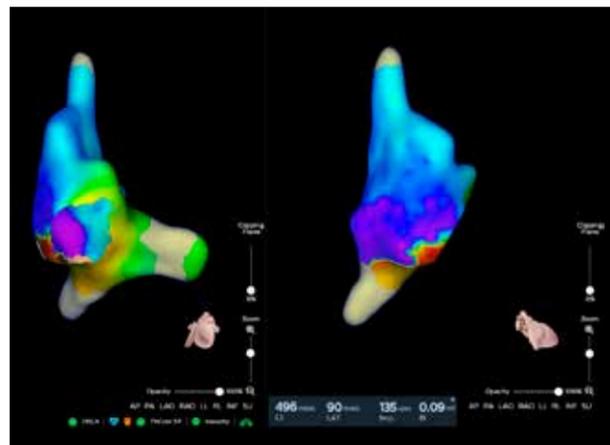


Figure 4: KODEX-EPD system offers common mapping functionalities including voltage and LAT mapping.

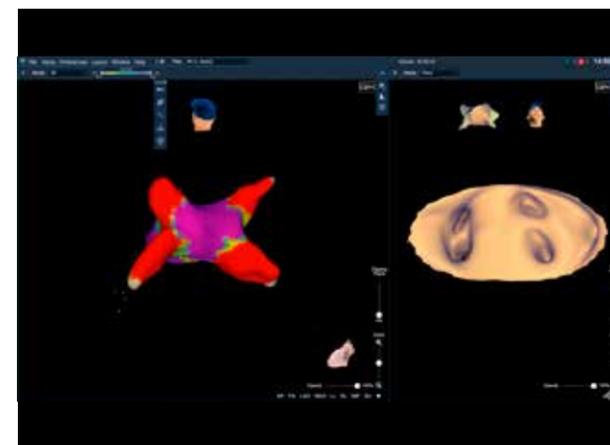


Figure 6: Posterior view of left atrium, showing 3D voltage map post-Cryoballoon ablation adjacent to an anterior anatomical image in PANO.

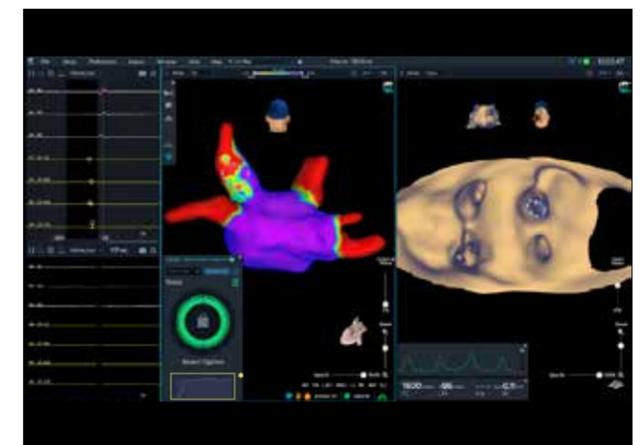
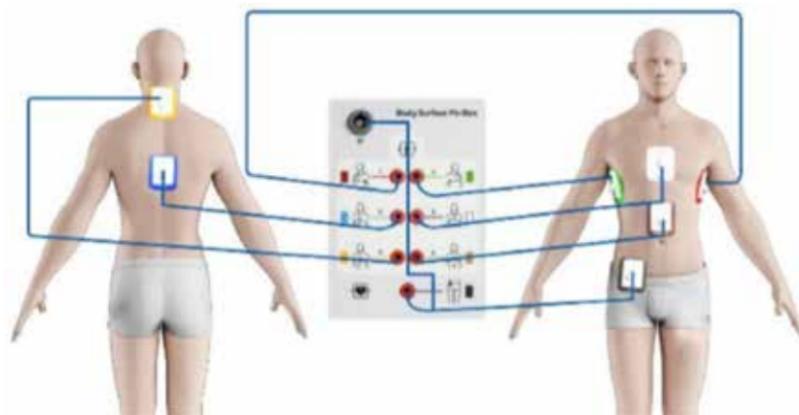


Figure 8: Occlusion Viewer using Injection Assessment, assists with detection of smaller leaks during contrast injection, including the real time Dissipation Waveform graph<sup>2</sup>

# Specifications

KODEX-EPD processing unit	Dimensions (HxWxD)	47 cm x 45 cm x 24 cm (18.5" x 17.7" x 9.4")
	Weight	16 kg (35.3 lb)
	Power inputs	100-240 VAC 2.0/1.0A 50-60 Hz
KODEX-EPD workstation: Dell Precision 5820	Dimensions (HxWxD)	42 cm x 18 cm x 52 cm (16.5" x 7.1" x 20.5")
	Weight	15.4 kg (34 lb)
	Power inputs	950 W 100-240 VAC, 50-60 Hz



KODEX-EPD Dielectric Sensors used for each procedure

For more information about the procedure, indications, contraindications, warnings and cautions, refer to the KODEX-EPD user manual or contact EPD Solutions, a Philips company.

#### Clinical images courtesies

Figure 1: Prof. C. Blomström, Uppsala University Hospital, Uppsala - Sweden  
 Figure 2: Dr. Osorio, Grandview, Grandview Medical Group, Birmingham - United States  
 Figure 3 and 5: Prof. K-H Kuck and Dr. T. Maurer, Asklepios Klinik St. Georg, Hamburg - Germany  
 Figure 4, 7 and 8: Dr. Dekker, Catharinaziekenhuis, Eindhoven - Netherlands  
 Figure 6: Prof. Ng, A., Glenfield Hospital, Leicester - UK

## KODEX-EPD system for cardiac imaging and mapping





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