Imaging
beyond the catheter

KODEX-EPD cardiac imaging and mapping system

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, contrast media or touching the endocardium. This technology overcomes many limitation 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 contact or radiation

The KODEX-EPD system provides real-time, high-definition imaging that visualizes true anatomy during EP procedures. No ionizing radiation, contrast medium or contact with the endocardium 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 view shows all relevant structures in one overview to enhance understanding of 3D anatomy, enable 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 field generator frame or reference points, and is free from limitations of existing magnetic or impedance-based technologies like artifacts due to patient movement or distortions from metal objects in the field.

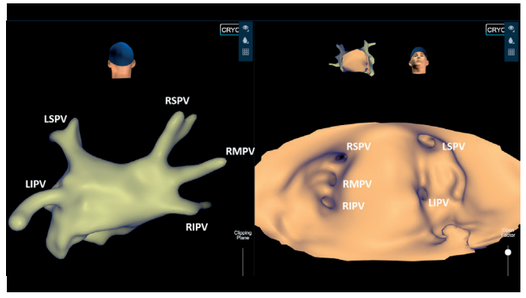


Figure 1: Left atrial anatomy showing an accessory right middle pulmonary vein (RMPV) in 3D posterial view adjacent to an anterior PANO view.

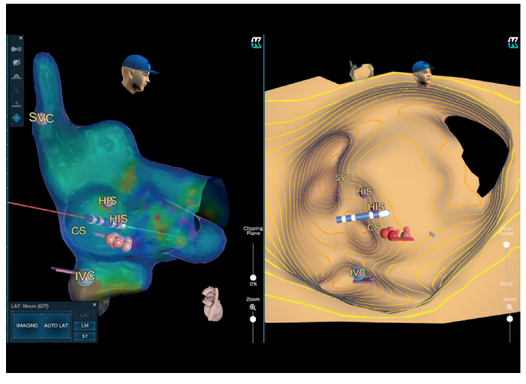


Figure 2: 3D glass view of the right atrium next to PANO view (including contour lines).

Personalize therapy based on intraprocedural insights

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.

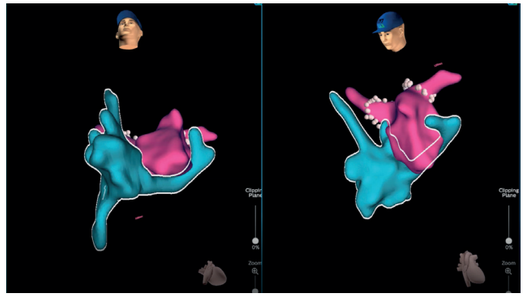


Figure 3: 3D Multi-chamber view of the left and right atria showing CS extending around LA with RF ablation tags visible.

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

Simplify your workflow for **more efficient procedures**

The KODEX-EPD system promotes predictable and streamlined Medtronic Cryoablation procedures supported by an efficient imaging and mapping workflow. 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 view reduces the need for image maneuvering.

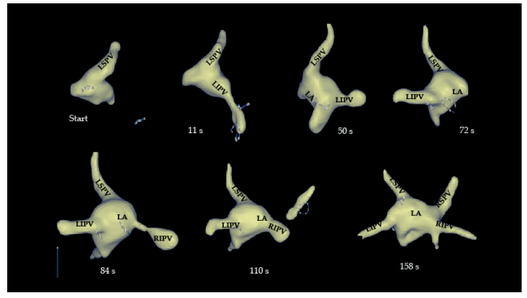


Figure 5: Example showing how KODEX-EPD builds up a detailed 3D image of the left atrium in as little as 3 minutes.

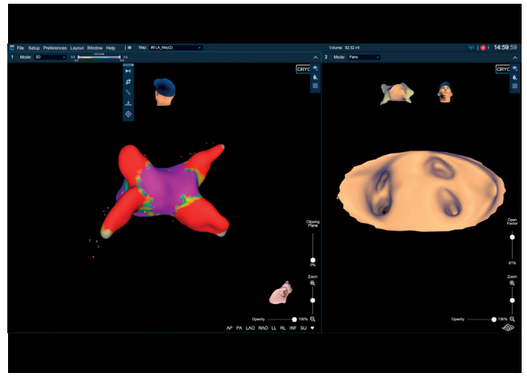


Figure 6: Posterior view of left atrium, showing 3D voltage map post-Cryoballoon ablation adjacent to an anterior anatomical image in PANO view.

Optimize your **quality of care**

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 feature provides an assessment of pulmonary vein occlusion, reducing the dependency on X-ray, by utilizing dielectric sensing with the Medtronic Achieve™ Mapping Catheter.[1]

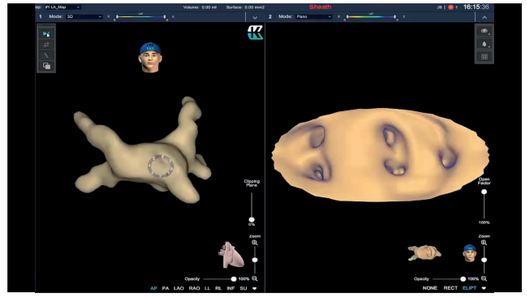


Figure 7: Left atrial anatomy obtained with Medtronic Achieve™ Mapping Catheter during a Cryoballoon ablation procedure.

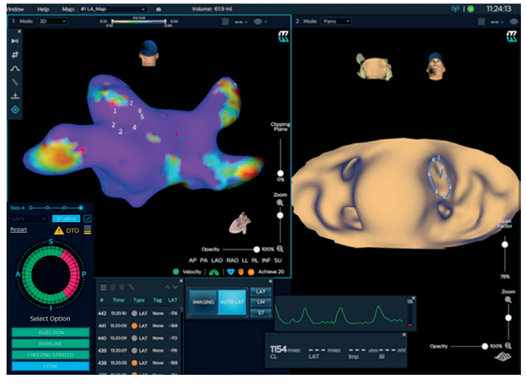


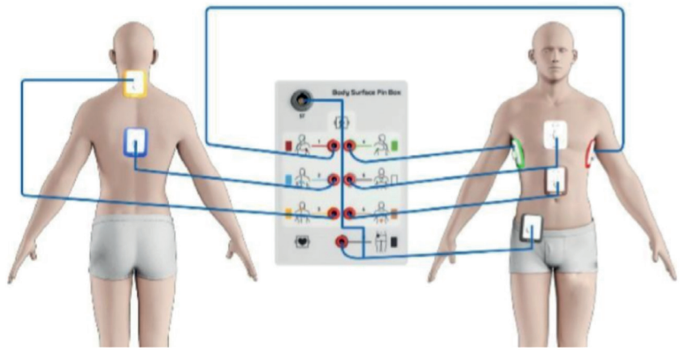
Figure 8: Balloon Occlusion feature provides an assessment of PV occlusion without X-ray and can show the orientation of the leak.

Images shown in this brochure are processed using different KODEX-EPD software versions for illustration purposes only.

1 While using KODEX-EPD occlusion functionality, always refer to the applicable Cryoballoon technical manual, published literature, and exercise your physician discretion to guide confirmation of pulmonary vein occlusion.

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	2A @ 90 VAC 1A @ 240 VAC 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: Dr. Rillig and Dr. Metzner, University Medical Center Hamburg-Eppendorf (UKE) - Hamburg, Germany
Figure 2: Dr. Biton, Hadassah Medical Center - Ein Kerem, Israel
Figure 3, 5 and 7: Prof. K-H Kuck and Dr. T. Maurer, Asklepios Klinik St. Georg, Hamburg - Germany
Figure 4 and 8: Dr. Dekker, Catharinaziekenhuis, Eindhoven - Netherlands
Figure 6: Prof. Ng, A., Glenfield Hospital, Leicester – UK

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