



## Ziehm Vision RFD Hybrid Edition

The comprehensive  
mobile hybrid solution

CMOSLINE





Ziehm Vision RFD Hybrid Edition. An aging population is creating an increasing demand for cardiovascular surgery. The Ziehm Vision RFD Hybrid Edition<sup>3</sup> is a powerful 30 kW<sup>2</sup> mobile C-arm that comes with CMOS technology for even better image quality in these challenging procedures. By taking OR flexibility and clinical capabilities to the next level, the Ziehm Vision RFD Hybrid Edition is a valuable contribution to any clinic's competitiveness and financial performance. Requiring zero modifications to existing ORs, this mobile, feature-rich hybrid solution is ready to go – anytime, anywhere.

## 01 / Extend your cardiovascular surgical capabilities with a powerful 30 kW mobile C-arm

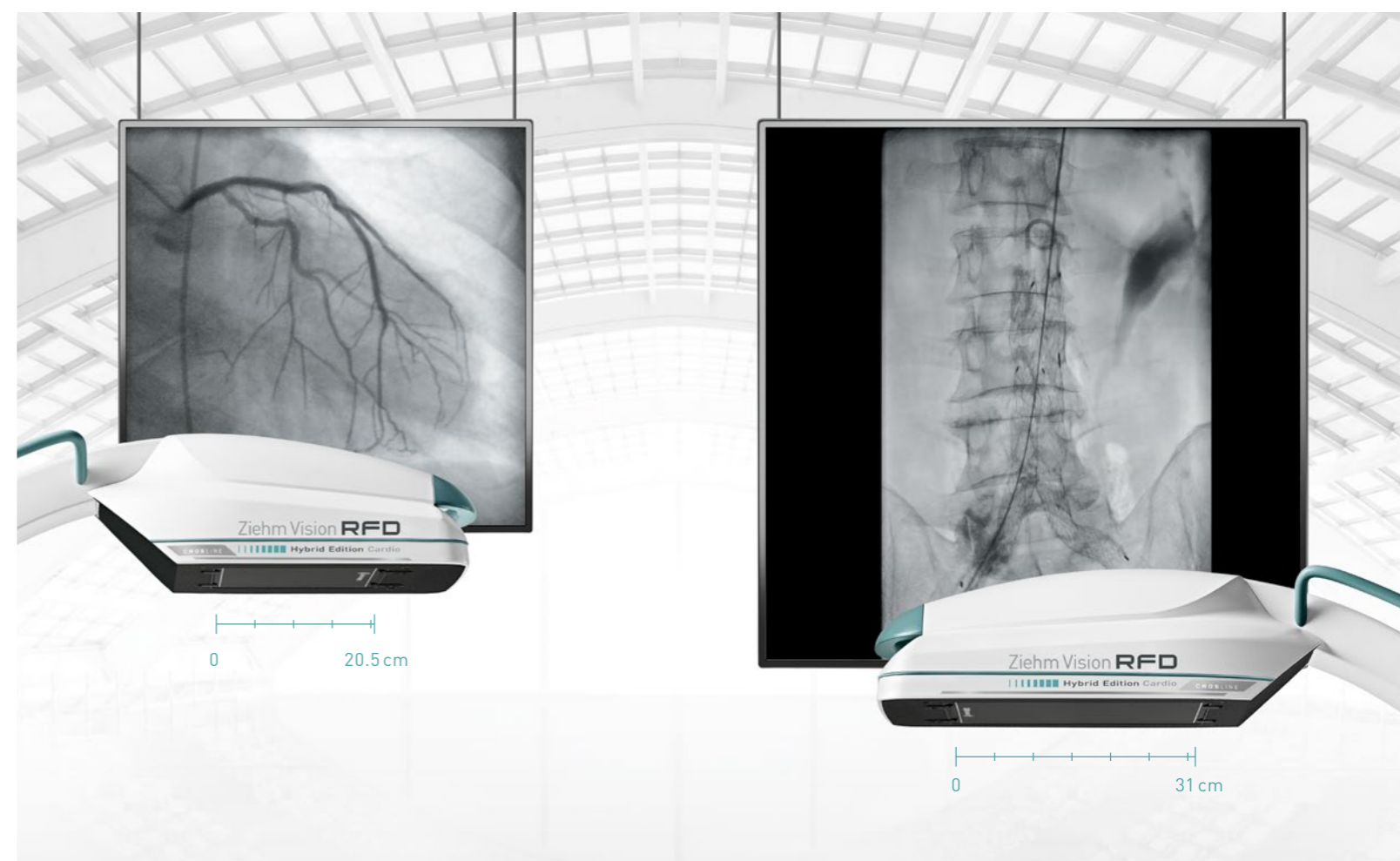
The Ziehm Vision RFD Hybrid Edition is powering the growing convergence between surgery and minimally invasive procedures. It quickly and easily extends clinical capabilities to include hybrid cardiovascular surgery. Featuring CMOS technology for excellent image quality, the Ziehm Vision RFD Hybrid Edition comes with an enhanced imaging chain, better resolution and improved dose management for optimized clinical outcomes.

### → CMOS flat-panel technology

Image quality and efficiency are the most important, but also challenging, factors in daily clinical routines. Compared with conventional C-arms, the latest flat-panel technology with CMOS achieves higher spatial resolution due to a smaller pixel size combined with lower noise levels and a higher read-out speed at full resolution. True resolution, especially in the magnification modes, makes interpolation unnecessary. CMOS technology therefore enables improved overall efficiency.

In addition, the Ziehm Vision RFD Hybrid Edition CMOSline<sup>4</sup> comes with an enhanced version of our comprehensive SmartDose concept<sup>5</sup>. Our dose-saving technology – Beam Filtration<sup>1</sup> – supports the latest improvements in our enhanced CMOS imaging chain, thus enabling an exceptional skin entrance dose reduction. This innovation allows the Ziehm Vision RFD Hybrid Edition to provide excellent image quality with a lower dose.

CMOSLINE



### → Different detector sizes for extended clinical capabilities

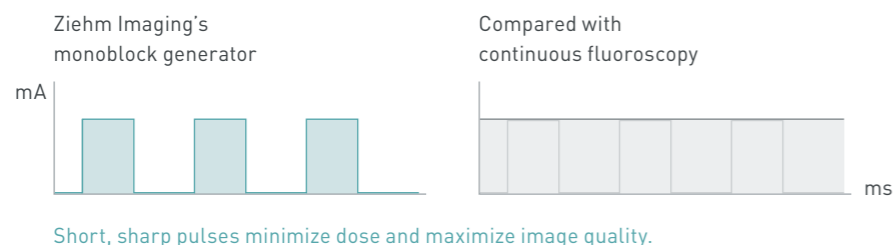
The dimensions of the flat-panel detector play a crucial role in OR ergonomics. The Ziehm Vision RFD Hybrid Edition CMOSline features not only a cardiovascular focused 20.5 cm x 20.5 cm but also a 31 cm x 31 cm flat-panel detector for extended hybrid and CathLab applications. Aside from clinical interventions, such as coronary angiography, heart valve implantations and pacemaker interventions, the system is also ideally equipped for complex TAVI or EVAR procedures. This setup enables the mobile C-arm to deliver high quality X-ray images that were previously only possible with fixed room systems.

→ Compact and industry leading 30kW generator

The powerful high frequency generator operates with a variable pulse width, optimizing the image quality while minimizing dose levels. With up to 300 mA, the C-arm provides crystal-clear images, even of fast-moving objects. Due to the first real 30 kW generator performance on the market (according to IEC 60601-2-54 norm) and an innovative imaging chain, the system delivers excellent results even during exposures with steep angles and lateral projections. The small housing of the compact yet powerful 30kW generator further simplifies its positioning at the OR table.

→ Prolonged use with intelligent heat management

C-arms need to be in continuous use during lengthy, demanding procedures, such as vascular interventions. To ensure consistent system temperature and prevent system failure due to overheating, the Ziehm Vision RFD Hybrid Edition is ideally equipped with Advanced Active Cooling (AAC). Even during complex applications, such as TAVI, angioplasties and EVAR, this C-arm delivers reliable results for the duration of the entire procedure. In the event of a temperature increase, the pulse frequency is automatically reduced until the generator's temperature has cooled down.



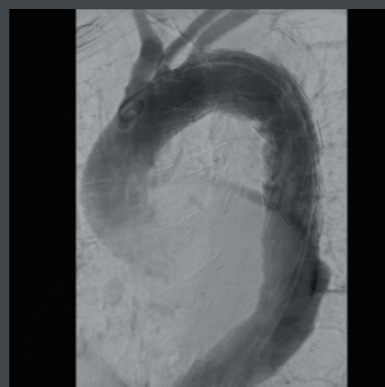
Sophisticated system to avoid generator overheating

Advanced Active Cooling keeps generator temperatures down through automatic adaptation of the pulse rate combined with a powerful liquid cooling system.

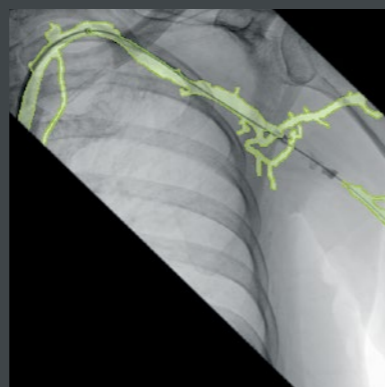




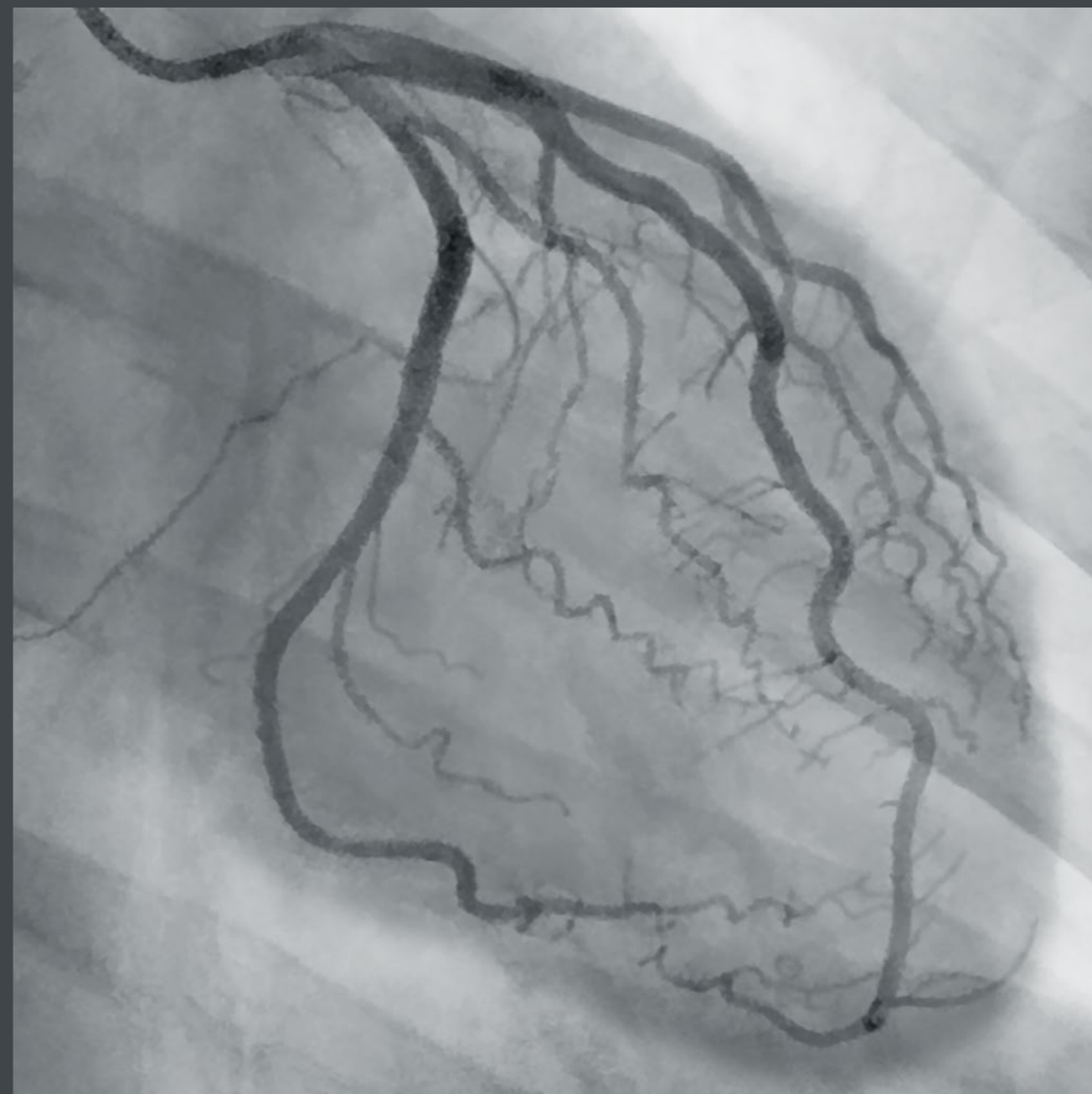
Endovascular aneurysm repair (EVAR)



Aortic arch



Enhanced Vessel Visualization



Right coronary arteries

“Exceptional image quality is at the center of daily clinical work in our department. The Ziehm Vision RFD Hybrid Edition CMOSline supports me all along the line with high-resolution imaging and an impressive dynamic range. These advantages become particularly obvious in complex procedures, where the visualization of even the smallest vessels or tools are key.”

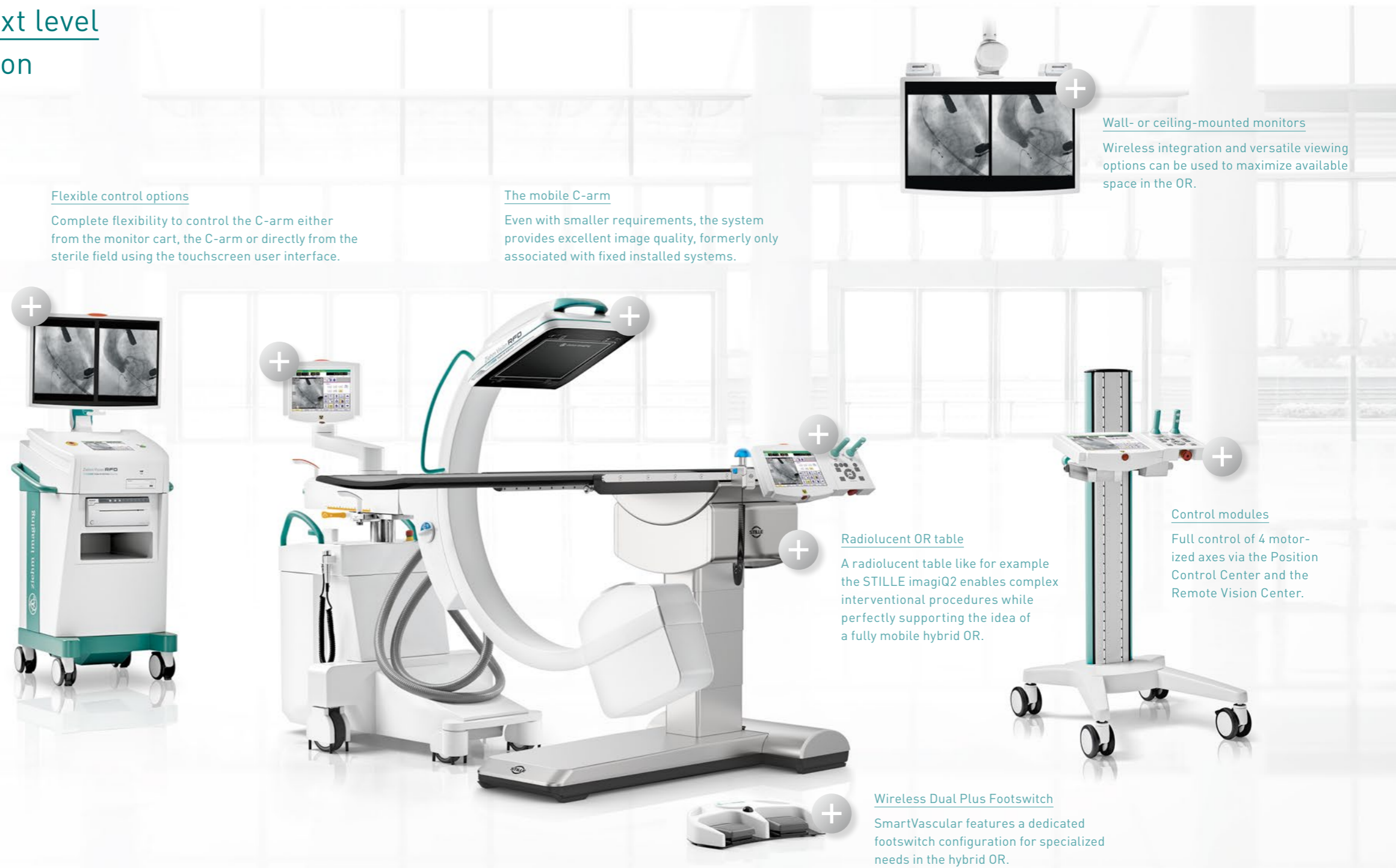
**Prof. Dr. Tomasz Zubilewicz, University Hospital Lublin, Poland**

## 02/ Take your OR to the next level with a mobile hybrid solution

The Ziehm Vision RFD Hybrid Edition provides the opportunity to perform advanced hybrid room procedures or complex CathLab interventions in a conventional OR setup. With a small footprint and good maneuverability, this mobile solution is designed for ease of operation. Ergonomic features and the Ziehm Usability Concept<sup>6</sup> perfectly support an efficient clinical workflow – which is important during challenging cardiovascular procedures.

### → The mobile hybrid solution

The Ziehm Vision RFD Hybrid Edition is more than a mobile C-arm. In combination with a broad variety of components, such as versatile viewing options, a mobile surgical imaging table and individually mountable control modules, the C-arm represents a comprehensive mobile solution for complex, interdisciplinary hybrid OR or advanced CathLab applications.



#### Flexible control options

Complete flexibility to control the C-arm either from the monitor cart, the C-arm or directly from the sterile field using the touchscreen user interface.

#### The mobile C-arm

Even with smaller requirements, the system provides excellent image quality, formerly only associated with fixed installed systems.

#### Wall- or ceiling-mounted monitors

Wireless integration and versatile viewing options can be used to maximize available space in the OR.

#### Control modules

Full control of 4 motorized axes via the Position Control Center and the Remote Vision Center.

#### Radiolucent OR table

A radiolucent table like for example the STILLE imagiQ2 enables complex interventional procedures while perfectly supporting the idea of a fully mobile hybrid OR.

#### Wireless Dual Plus Footswitch

SmartVascular features a dedicated footswitch configuration for specialized needs in the hybrid OR.

→ Motorization and isocentric movement

The Ziehm Vision RFD Hybrid Edition mobile C-arm is equipped with motorization that allows easy control of all four axes. The operator can either use the Remote Vision Center (touchscreen) or the Position Control Center (joysticks) to move the C-arm into the exact desired position. Operating the device right from the OR table in the sterile field minimizes the time needed and guarantees maximum precision. With the freely selectable isocenter, any given anatomical structure can be displayed from different angles without having to re-adjust the C-arm. The isocenter is held during angulation and orbital movement thanks to the motorized axes. All of this with just one click. Additionally, the Position Control Center allows storage of up to three C-arm positions, which can be recalled during the procedure. The home button brings all movements back to the starting position.

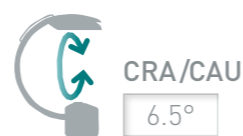
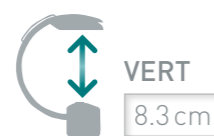
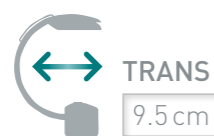
→ Patient safety – a top priority

Our motorized C-arms are equipped with Distance Control – an assistance system supporting non-contact collision protection. In the patient’s proximity, the motorized movement is slowed down. The movement stops immediately before entering a predefined zone.



Precise control via Position Control Center combined with display of C-arm coordinates on touchscreen ensure exact and fast positioning of the device.

EXACT C-ARM POSITIONING





→ Ziehm Usability Concept

Heavy case loads and a large number of different users call for OR equipment with a highly standardized and ergonomic design. Ziehm Imaging supports this need with the unique Ziehm Usability Concept. Seamlessly integrated workflows offer unmatched levels of usability – anytime, anyplace.

As an innovation and technology leader, Ziehm Imaging has developed the sophisticated yet intuitive Ziehm Usability Concept that combines a unique and finely tuned set of hardware features with seamlessly integrated software functionalities. In a challenging clinical environment, the entire concept is geared toward increasing ease of use in daily tasks. It improves process efficiency and ensures standardized quality levels in the OR for optimized patient outcomes.



**COLOR-CODED SCALES AND HANDLES** to ensure clear communication in the OR



**WIRELESS DUAL-PLUS FOOTSWITCH** to control all imaging functionalities without any disturbing cables



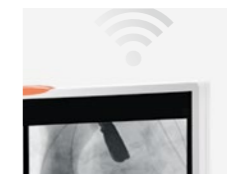
**MOST COMPACT FOOTPRINT WITH 0.8m<sup>2</sup>** to fit in even the smallest treatment scenarios



**ZIEHM NETPORT** with WLAN enables easy integration into IT networks



**UP TO 165° OF ORBITAL MOVEMENT** to support easier patient coverage



**WIRELESS VIDEO** transmitting live X-ray images to external monitors



**ZIEHM VISION CENTER** featuring an intuitive touch-screen user interface



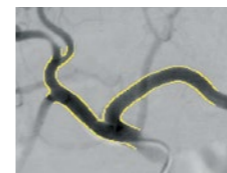
**CONTROL MODULES** for a fast and flexible setup in the sterile field



**SMARTEYE** enabling users to keep track of orientation and object position



**VERSATILE VIEWING OPTIONS** to offer maximum flexibility in the OR



**ANATOMICAL MARKING TOOL** to easily apply markings and labels to fluoroscopic images – now enhanced with color

## 03/ Plug in and start your hybrid procedure with zero room preparation

The Ziehm Vision RFD Hybrid Edition challenges the notion that hybrid ORs are typically space-intensive and costly. The mobile device requires zero modifications to the OR and is up and running in no time. Easy installation and reduced operating costs make the Ziehm Vision RFD Hybrid Edition efficient, flexible and competitive.

### → Best-in-class ergonomics

With a footprint of 0.8 m<sup>2</sup>, the Ziehm Vision RFD Hybrid Edition is one of the most compact mobile C-arms on the market. With its easy-drive system and the fully motorized C-arm, the system can be maneuvered with minimal effort during long procedures. The big C-arm opening and 165 degrees of orbital movement ideally support the workflow and provide easier patient coverage.



### Easy handling

165 degrees of orbital movement and an 84 cm C-arm opening provide ideal support for clinical workflows.



### → Ideal solution for every OR

The Ziehm Vision RFD Hybrid Edition is a mobile solution that offers all required qualities to instantly convert conventional ORs into a hybrid room or a mobile CathLab. Compared to a fixed installed system it features a small footprint and inexpensive operating costs without the need for a careful planning and construction phase in the OR.

#### + Multidisciplinary concept

Excellent imaging quality and ease of operation support both standard applications and complex ortho, trauma and spine procedures as well as vascular procedures in a mobile hybrid setup or cardiology interventions in a CathLab setup.

#### + Fast time to solution

This advanced motorized system is ready to run after just a short, simple training session. Thanks to its easy and intuitive user interface, it supports anyone in getting the most out of the mobile C-arm.

#### + No modifications to the OR required

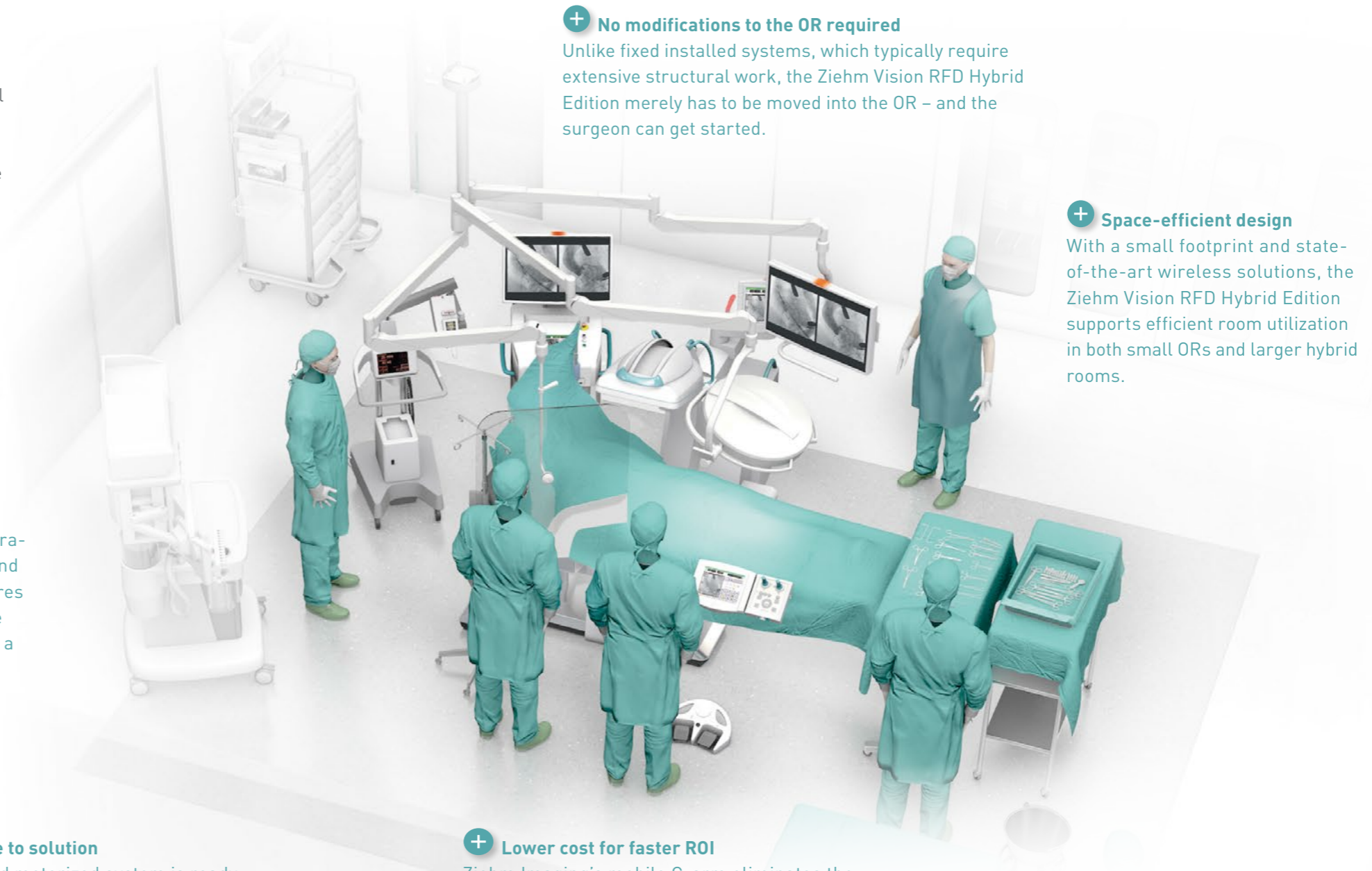
Unlike fixed installed systems, which typically require extensive structural work, the Ziehm Vision RFD Hybrid Edition merely has to be moved into the OR – and the surgeon can get started.

#### + Space-efficient design

With a small footprint and state-of-the-art wireless solutions, the Ziehm Vision RFD Hybrid Edition supports efficient room utilization in both small ORs and larger hybrid rooms.

#### + Lower cost for faster ROI

Ziehm Imaging's mobile C-arm eliminates the need for a separate control and technical room typically required for fixed installed systems. This means lower purchase and operating costs leading to a faster return on investment (ROI).



### → Clever connectivity options to our partners

The combination of an industry-leading mobile C-arm with application specific supplements like 3D image fusion systems, haemodynamic workstations, injectors as well as versatile viewing options instantly convert a mobile C-arm into an all-embracing imaging solution.



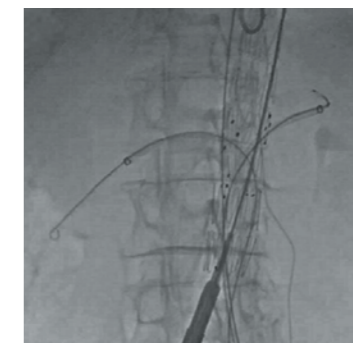
#### Mobile CathLab solutions

Connectivity options for haemodynamic workstations by Fysicon or CathLab-ready monitors complete the mobile CathLab.



#### 3D Image Fusion

Therenva's mobile image fusion system gives physicians more accuracy in demanding hybrid OR procedures. The combination of preoperative CT data with intraoperative images on the EndoNaut® system enables even more precise results while allowing physicians to reduce X-ray dose and contrast media use.



2D live fluoro image  
(from the C-arm)



3D Vascular Image Fusion  
(with Therenva)

→ Visualization of even the smallest details

The Ziehm Vision RFD Hybrid Edition CMOSline meets all of the demands that are placed on mobile imaging. The system features digital subtraction angiography (DSA) as well as maximum opacification angiography (MSA) and roadmapping (RSA) – either with iodine based contrast agent or with CO<sub>2</sub>. These special applications turn even demanding procedures such as AAA, heart valve implantations and stenting into routine clinical practice with a mobile hybrid solution.

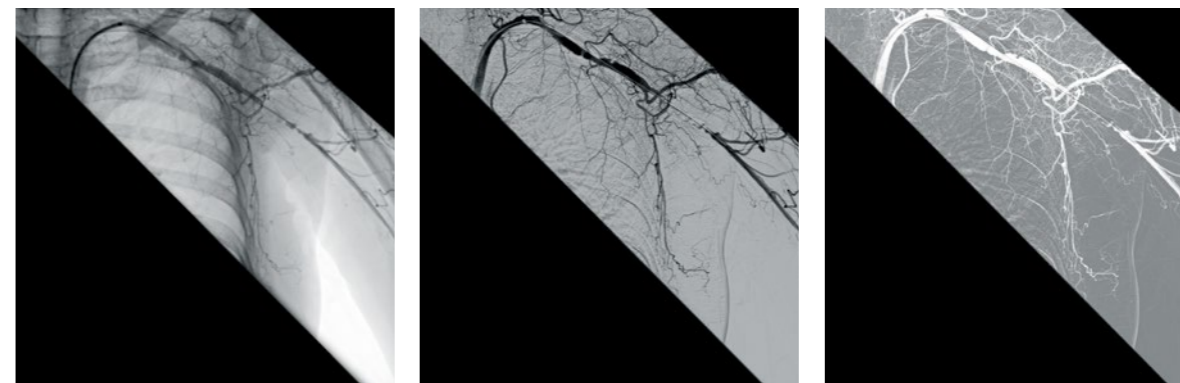
→ Comprehensive tools to support optimal image quality

SmartVascular offers a specialized workflow to meet the needs of complex vascular procedures. It allows to easily switch between Fluoro, DSA, MSA and RSA with just one click. This enables the surgeon to perform an RSA from a single DSA image, which saves precious time in the OR as well as reduces the dose applied to the patient. In addition, SmartVascular features a dedicated foot-switch configuration, that supports an easy and intuitive vascular workflow.

With the introduction of color to our comprehensive set of software functions, Enhanced Vessel Visualization and the improved measurement functions enhance daily communication in the OR and boost fast, efficient and secure decision-making and help to ease daily workflows.

The Anatomical Marking Tool (AMT) enables the user to apply markings and annotations, such as left/right labels, to live images by using the touchscreen. This innovative tool allows marking of blood vessels, branches or implant positions on live images – now also enhanced with color.

Contrast medium imaging with CO<sub>2</sub> is an innovative and cost-efficient alternative for patients with allergic reactions or other contraindications to conventional iodinated contrast agent. With the specialized CO<sub>2</sub> package for the Ziehm Vision RFD Hybrid Edition, DSA, MSA and RSA images are displayed in the known way as with iodine-based contrast agent.



Native image

Digital-Subtraction-Angiography (DSA)

Roadmapping (RSA)

CO<sub>2</sub>-DSA-workflow with an image quality only known from conventional contrast agents



## 04/Reduce exposure significantly with the next-generation SmartDose Concept

The Ziehm Vision RFD Hybrid Edition is designed to meet growing demand among surgeons and their staff for minimized dose exposure without compromising on image quality. Optimal filtration and advanced anatomical programs deliver on these demands, making this device perfect for dose-sensitive applications.

### → Best image quality. Minimized dose.

The comprehensive concept consists of a broad, clinically proven application portfolio to address daily challenges of low dose and high image quality. With significant dose savings, Ziehm Imaging sets the benchmark in user-friendly adjustments of dose exposure. SmartDose<sup>5</sup> helps display even the smallest details of complex anatomical areas and reduce dose with intelligent pulse regulation and optimized anatomical programs. Furthermore, dedicated SmartDose functions significantly reduce exposure in pediatric surgery<sup>7</sup>.

### → Beam Filtration for reduced skin entrance dose

Our feature-rich SmartDose concept comes with the groundbreaking Beam Filtration<sup>1</sup> technology. Dose reduction techniques for an optimized X-ray spectrum support our enhanced CMOS imaging chain. Beam Filtration enables an exceptional reduction in the skin entrance dose for Ziehm Imaging flat-detector systems in comparison to systems with conventional filtration technology.



**SmartDose**  
Best image quality. Minimized dose.



#### LASER POSITIONING DEVICE

integrated in flat-panel or I.I. and generator housing for accurate and dose-free positioning of C-arm



#### REDUCTION OF PULSE FREQUENCY

manually or fully automatically to lower the accumulated dose



#### OBJECT DETECTED DOSE CONTROL (ODDC)

to automatically analyze the area of interest and minimize dose while optimizing image quality



#### ANATOMICAL PROGRAMS

with automatic optimization of dose and image quality for best results



#### HIGH-SPEED ADR

for intelligent, fast regulation of pulse rate to lower the dose level



#### ZAIIP ALGORITHM AND FILTERS

to display fast-moving objects like guide wires and even the smallest vessels in razor-sharp image quality



#### LOW DOSE MODE

in all anatomical programs for particularly dose-sensitive procedures, e.g. in pediatrics



#### PREMAG

for exposure-free magnification of X-ray images



#### AUTOMATIC ADJUSTMENT

for large patients – with no additional increase in dose



#### REMOVABLE GRID

to reduce dose in pediatric and other dose-sensitive procedures



#### VIRTUAL COLLIMATORS

for exposure-free positioning of collimators



#### BEAM FILTRATION

for reduced skin entrance dose without compromising on image quality

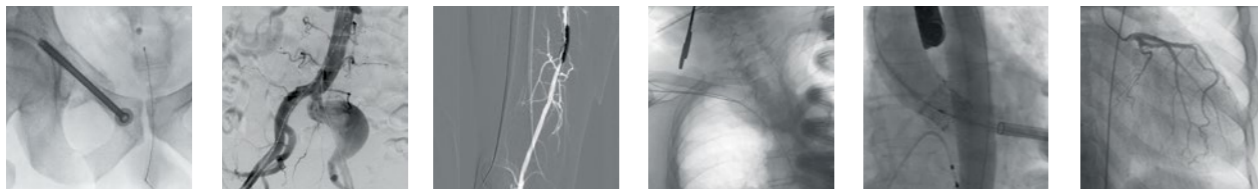


FEATURES

Imaging technology	a-Si, flat-panel, 30 cm x 30 cm	CMOS, flat-panel, 20.5 cm x 20.5 cm / 31 cm x 31 cm
Detector resolution	1.5 k x 1.5 k	2 k x 2 k / 3 k x 3 k
Power generator	25 kW, pulsed monoblock generator	25 kW / 30 kW <sup>2</sup> , pulsed monoblock generator
Ziehm Usability Concept	■	■
SmartDose	■	■
Advanced Active Cooling (AAC)	■	■
Orbital movement	165 degrees	165 degrees
Motorization	Full control of the 4 motorized axes	Full control of the 4 motorized axes
3D Vascular Image Fusion	Therenva EndoNaut®	Therenva EndoNaut®
Haemodynamic workstation	Fysicon QMAPP®	Fysicon QMAPP®

available ■ | not available –

CLINICAL APPLICATIONS



Orthopedics/  
Trauma/Spine

Endovascular  
surgery

Angioplasty

Electrophysiology

Interventional  
cardiology

Coronary imaging



Offices

1. Nuremberg (Germany)
2. Paris (France)
3. Valencia (Spain)
4. Reggio Emilia (Italy)
5. Tulln an der Donau (Austria)
6. Kerava (Finland)
7. Tokyo (Japan)
8. Shanghai (China)
9. Guangzhou (China)
10. Singapore (Singapore)
11. Midrand (South Africa)
12. São Paulo (Brazil)
13. Orlando, FL (USA)
14. Scottsdale, AZ, Orthoscan (USA)

MAXIMIZE YOUR UPTIME



Make sure to get the best service for your daily business.

Rely on Ziehm Imaging for flexible and fast service to stay on the cutting edge of technology. Tailored service packages, remote service and individual upgrade paths keep you competitive in your daily hospital routine.

<sup>1</sup> The technology Beam Filtration reduces dose exposure for Ziehm Imaging flat-detector systems in comparison with conventional filtration techniques. Data on File. Results may vary.

<sup>2</sup> 30kW generator is available in combination with dedicated cardio packages.

<sup>3</sup> Ziehm Vision RFD Hybrid Edition represents a group of optional hardware and software that creates an option package on the device named Ziehm Vision RFD.

<sup>4</sup> CMOSline represents a system configuration that is based on a Ziehm Imaging CMOS flat-panel detector.

<sup>5</sup> The SmartDose Concept includes a variety of hard- and software features. Due to regulatory reasons the availability of each feature may vary. Please contact your local Ziehm Imaging sales representative for detailed information.

<sup>6</sup> The Usability Concept includes a variety of hard- and software features. Due to regulatory reasons the availability of each feature may vary. Please contact your local Ziehm Imaging sales representative for detailed information.

<sup>7</sup> Gosch D. et al. "Influence of grid and ODDC on radiation exposure and image quality using mobile C-arms – First results," R6Fo, 09/07

<sup>8</sup> EndoNaut® is a registered trademark of Therenva SAS. In the USA, the EndoNaut® software obtained a substantial equivalence determination and FDA clearance through the CDRH premarket notification process [510(K)]. In Europe, the EndoNaut® software is CE marked (class IIb), not eligible for reimbursement. The information provided in the labelling and manual is intended for Healthcare Professionals only. For the safe and successful operation and use of the device, always read the instructions.

<sup>9</sup> QMAPP® is a registered trademark of Fysicon B.V.. In the USA, the QMAPP® software obtained a substantial equivalence determination and FDA clearance through the CDRH premarket notification process [510(K)]. In Europe, the QMAPP® software is CE marked (class IIb). The information provided in the labelling and manual is intended for Healthcare Professionals only. For the safe and successful operation and use of the device, always read the instructions.

## HEADQUARTERS

### Germany

Ziehm Imaging GmbH  
Lina-Ammon-Strasse 10  
90471 Nuremberg, Germany  
Phone +49 911 660 67 0  
Fax +49 911 660 67 390  
info@ziehm.com

### USA

Ziehm Imaging  
A division of Ziehm-Orthoscan, Inc.  
6280 Hazeltine National Dr  
Orlando, FL 32822, USA  
Toll Free +1 800 503 4952  
Phone +1 407 6 15 8560  
Fax +1 407 6 15 8561  
mail@ziehm.com

### Brazil

Ziehm Medical do Brasil  
Av. Roque Petroni Jr.,  
1089 cj 904  
04707-000 São Paulo, Brazil  
Phone +55 11 30 33 59 99  
Fax +55 11 30 33 59 97  
brazil@ziehm.com

### Austria

Ziehm Imaging Austria GmbH  
Ziegelfeldstrasse 10  
3430 Tulln an der Donau  
Austria  
Phone +43 720 569 501  
austria@ziehm.com

### Italy

Ziehm Imaging Srl  
Via Paolo Borsellino, 22/24  
42124 Reggio Emilia, Italy  
Phone +39 05 22 61 08 94  
Fax +39 05 22 61 24 77  
italy@ziehm.com

### Spain

Ziehm Imaging Spain SLU  
Avenida Pérez Galdós 13-14<sup>a</sup>  
46007 Valencia, Spain  
Phone +34 960 911 152  
spain@ziehm.com

### France

Ziehm Imaging S.A.R.L.  
1, Allée de Londres  
91140 Villejust, France  
Phone +33 1 69 07 16 65  
Fax +33 1 69 07 16 96  
france@ziehm.com

### Finland

Ziehm Imaging Oy  
Kumitehtaankatu 5  
04260 Kerava, Finland  
Phone +358 4 49 75 75 37  
finland@ziehm.com

### China

Ziehm Medical Shanghai Co., Ltd.  
Hongqiao New Tower Centre  
Rm 02-06, 29/F  
83 Loushanguan Road  
Shanghai, P.R. China; 200336  
Phone +86 21 62 36 99 03  
Fax +86 21 62 36 99 16  
china@ziehm.net.cn

### Singapore

Ziehm Imaging Singapore Pte. Ltd.  
7030 Ang Mo Kio Ave 5  
#08-53 Northstar@AMK  
Singapore 569880, Singapore  
Phone +65 6 39 1 86 00  
Fax +65 6 39 6 30 09  
singapore@ziehm.com

### Japan

Ziehm Imaging Japan KK  
REID-C Nihonbashi Koamicho bldg 2F  
11-5 Nihonbashi Koamicho Chuo-ku  
Tokyo 103-0016, Japan  
Phone +81 3 5643 5791  
Fax +81 3 3663 5278  
japan@ziehm.com