



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 Edition² is a powerful 25 kW mobile C-arm that comes with CMOS technology for even better image quality in challenging procedures such as these. 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 25 kW mobile C-arm

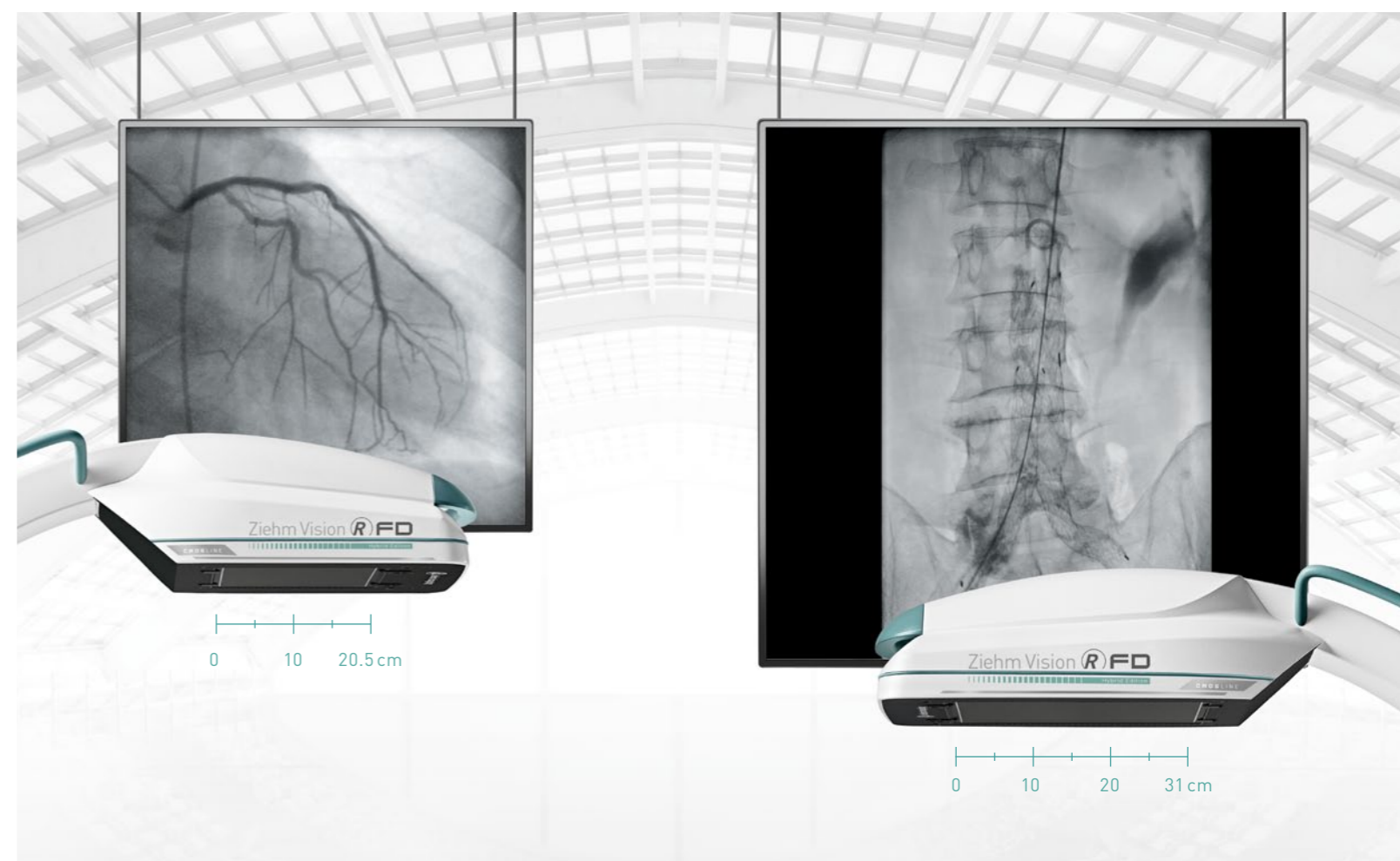
The Ziehm Vision RFD Hybrid Edition is powering the growing convergence between surgery and minimally invasive procedures. It quickly and easily extends clinical capabilities to include hybrid cardiovascular surgery. Now featuring CMOS technology for excellent image quality, the Ziehm Vision RFD Hybrid 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 CMOSline³ now comes with an enhanced version of our comprehensive SmartDose⁴ concept. A newly developed dose saving technology – Beam Filtration¹ – 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

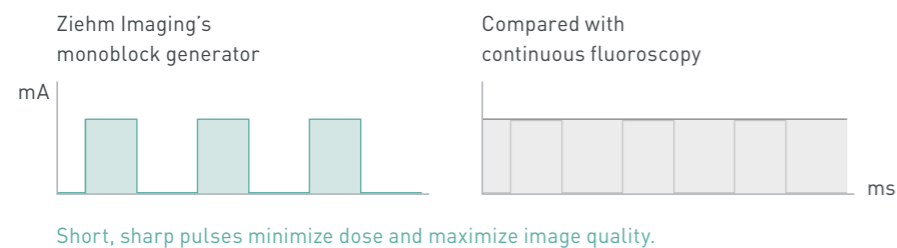
The dimensions of the flat-panel detector play a crucial role in OR ergonomics. The Ziehm Vision RFD Hybrid Edition CMOSline features not only a cardiovascular focused 20.5 cm x 20.5 cm but also a 31 cm x 31 cm flat-panel detector for extended hybrid application. Aside from clinical interventions, such 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 powerful 25 kW generator

The industry leading high frequency generator operates with a variable pulse width, optimizing the image quality while minimizing dose levels. With up to 25 frames per second, the C-arm provides crystal-clear images, even of fast-moving objects. Due to its outstanding generator performance and 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 25 kW 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.



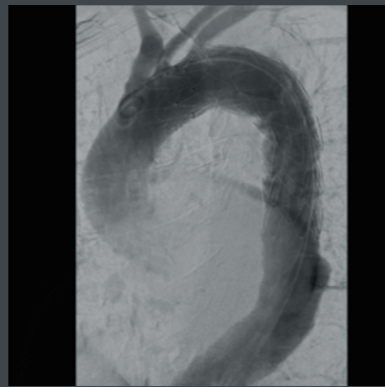
Sophisticated system to avoid generator overheating

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



Peripheral revascularization

“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 Zubilewic, University Hospital Lublin, Poland



Fenestrated endovascular aneurysm repair (FEVAR)

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 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 Concept⁵ 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 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

Unique to the market, 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.

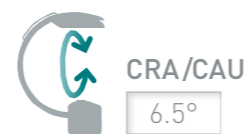
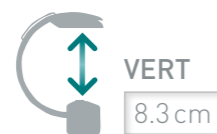
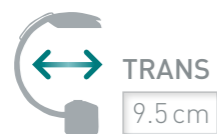
→ Patient safety – a top priority

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



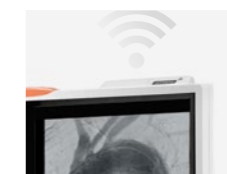
MOST COMPACT FOOTPRINT WITH 0.8M² to fit in even the smallest treatment scenarios



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



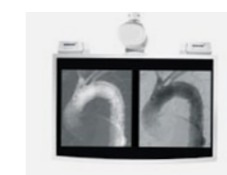
ZIEHM VISION CENTER featuring an intuitive touch-screen user interface



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



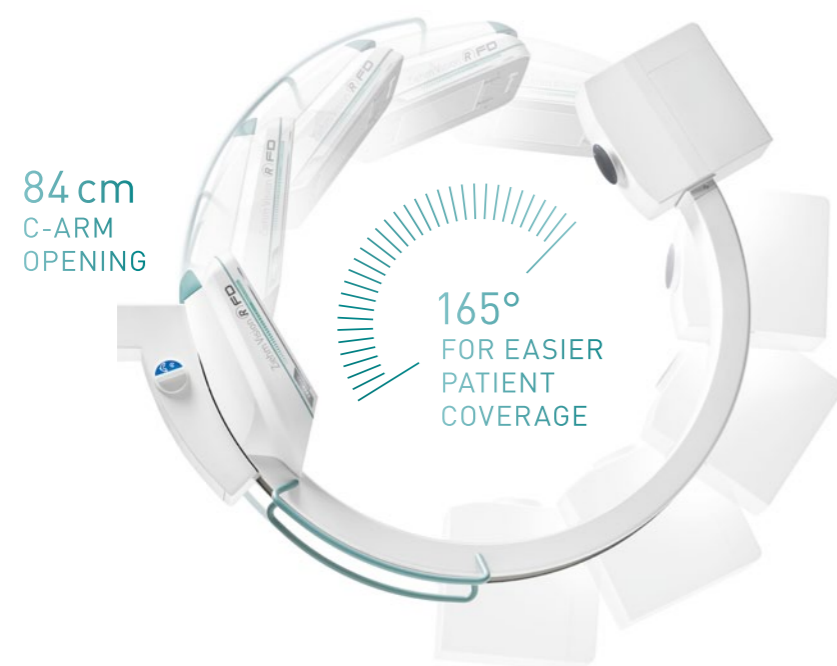
ANATOMICAL MARKING TOOL to easily apply markings and labels to fluoroscopic images

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 m², 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. 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 cardiovascular interventions in a mobile hybrid setup.

+ 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).

+ No modifications to the OR required

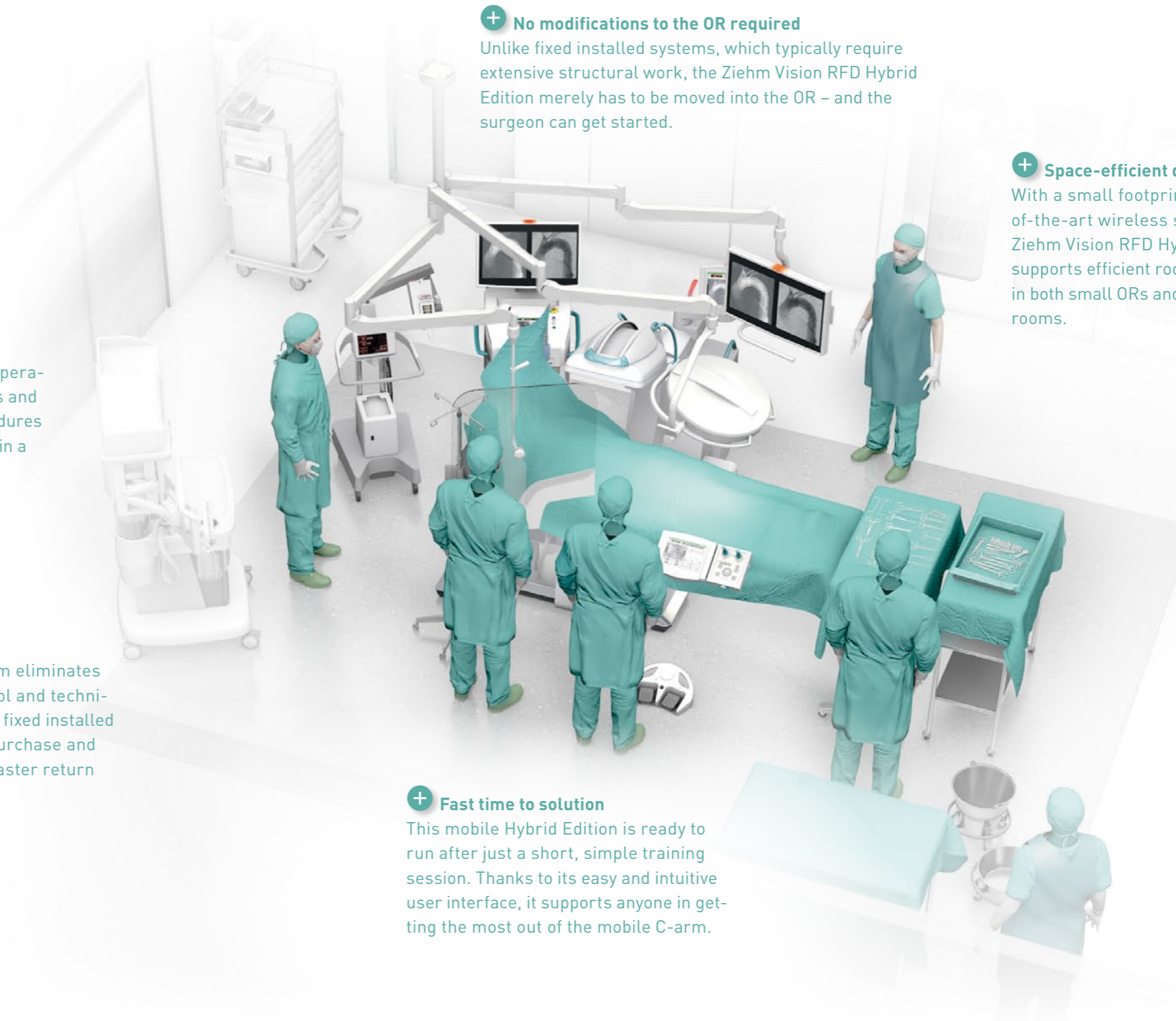
Unlike fixed installed systems, which typically require extensive structural work, the Ziehm Vision RFD Hybrid Edition merely has to be moved into the OR – and the surgeon can get started.

+ 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.

+ Fast time to solution

This mobile Hybrid Edition 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.



→ Visualization of even the smallest details

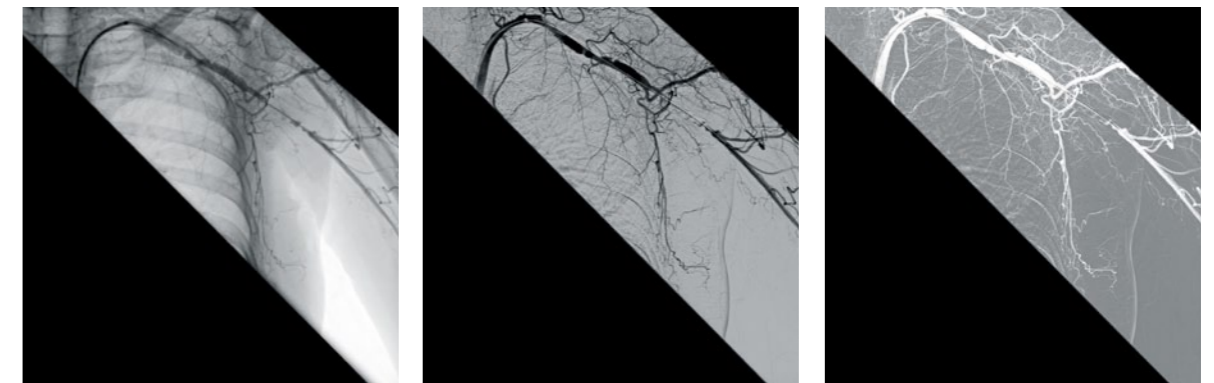
The Ziehm Vision RFD Hybrid Edition CMOSline meets all of the demands that are placed on mobile imaging. The system features digital subtraction angiography (DSA) as well as maximum opacification angiography (MSA) and roadmapping (RSA) – either with iodine based contrast agent or with CO₂. These special 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.

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.

Contrast medium imaging with CO₂ is an innovative and cost-efficient alternative for patients with allergic reactions or other contraindications to conventional iodinated contrast agent. With the specialized CO₂ 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.

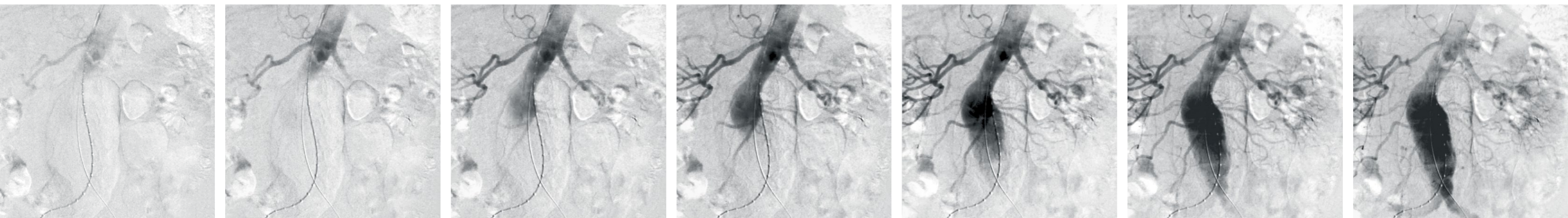


Native image

Digital-Subtraction-Angiography (DSA)

Roadmapping (RSA)

CO₂-DSA-workflow with an image quality only known from conventional contrast agents



04 / Reduce exposure significantly with the next-generation SmartDose

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. New filtration enhancements 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. Our latest improvements in SmartDose⁴ help 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 surgery⁶.

→ Beam Filtration for reduced skin entrance dose

Our feature-rich SmartDose concept now comes in a further developed version with the groundbreaking Beam Filtration¹ technology. The new dose reduction technique for an optimized X-ray spectrum supports our enhanced CMOS imaging chain. This combination enables an exceptional reduction in the skin entrance dose for all CMOSline systems. In a nutshell, the premium line of Ziehm Imaging C-arms provides excellent image quality with a lower dose.






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
- 
ZAIP 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, 20 cm x 20 cm CMOS, 20.5 cm x 20.5 cm	a-Si, 30 cm x 30 cm CMOS, 31 cm x 31 cm
 Power generator	25 kW, pulsed monoblock generator	25 kW, pulsed monoblock generator
 Optional: endoscopic landscape color monitor	■	■

CLINICAL APPLICATIONS

 Orthopedics/Trauma/Spine	•••	•••
 Endovascular surgery	••+	•••+
 Angioplasty	••	•••
 Electrophysiology	•••	••
 Interventional cardiology	•••+	•••+
 Coronary imaging	•••	••

available ■ | not available - | good • | very good •• | ideal ••• | particularly recommended +



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- 3 Scottsdale, AZ (USA)
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- 6 Reggio Emilia (Italy)
- 7 Kerava (Finland)
- 8 Midrand (South Africa)
- 9 Singapore (Singapore)
- 10 Shanghai (China)

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 at the cutting edge of technology. Tailored service packages, remote service and individual upgrade paths keep you competitive in your daily hospital routine.



¹ The technology Beam Filtration reduces dose exposure for all CMOSline systems in comparison with conventional filtration techniques (Status before September 2017). Data on file. Results may vary.

² 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.

³ CMOSline represents a system configuration that is based on a Ziehm Imaging CMOS flat-panel detector.

⁴ The SmartDose concept includes all mentioned features on page 21. Due to regulatory reasons the availability of each feature may vary. Please contact your local Ziehm Imaging partner for detailed information.

⁵ The Ziehm Usability Concept includes all mentioned features on page 13. Due to regulatory reasons, the availability of each feature may vary. Please contact your local Ziehm Imaging partner for detailed information.

⁶ Gosch D. et al. "Influence of grid and ODDC on radiation exposure and image quality using mobile C-arms – First results," RöFo, 09/07

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