



## Ziehm Vision RFD

The ultimate C-arm  
to outperform

CMOS LINE

19" TFT monitors for bright, high-contrast images and cine loops displayed with a wide viewing angle  
 ➤ 06



Wireless Video to transfer images to external monitors  
 ➤ 06

Anatomical Marking Tool for an additional layer of image information to support aortic stent graft implantation without the use of RSA  
 ➤ 06



Advanced Active Cooling for extended fluoroscopy time in challenging procedures  
 ➤ 10

Latest CMOS technology, based on over 10 years of experience with flat-panel detectors, for lower noise levels and higher spatial resolution  
 ➤ 04

Beam Filtration<sup>1</sup> for reduced skin entrance dose without compromising on image quality  
 ➤ 16

Powerful generator with 25kW for improved penetration of large anatomy  
 ➤ 10

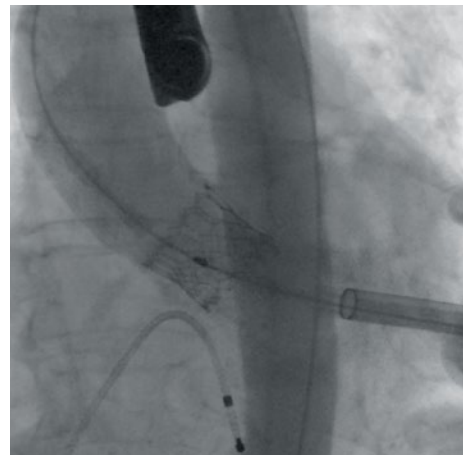
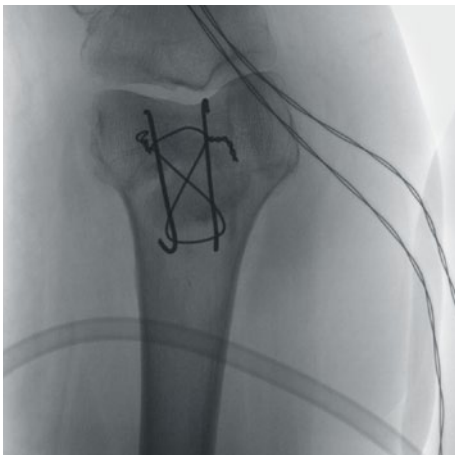
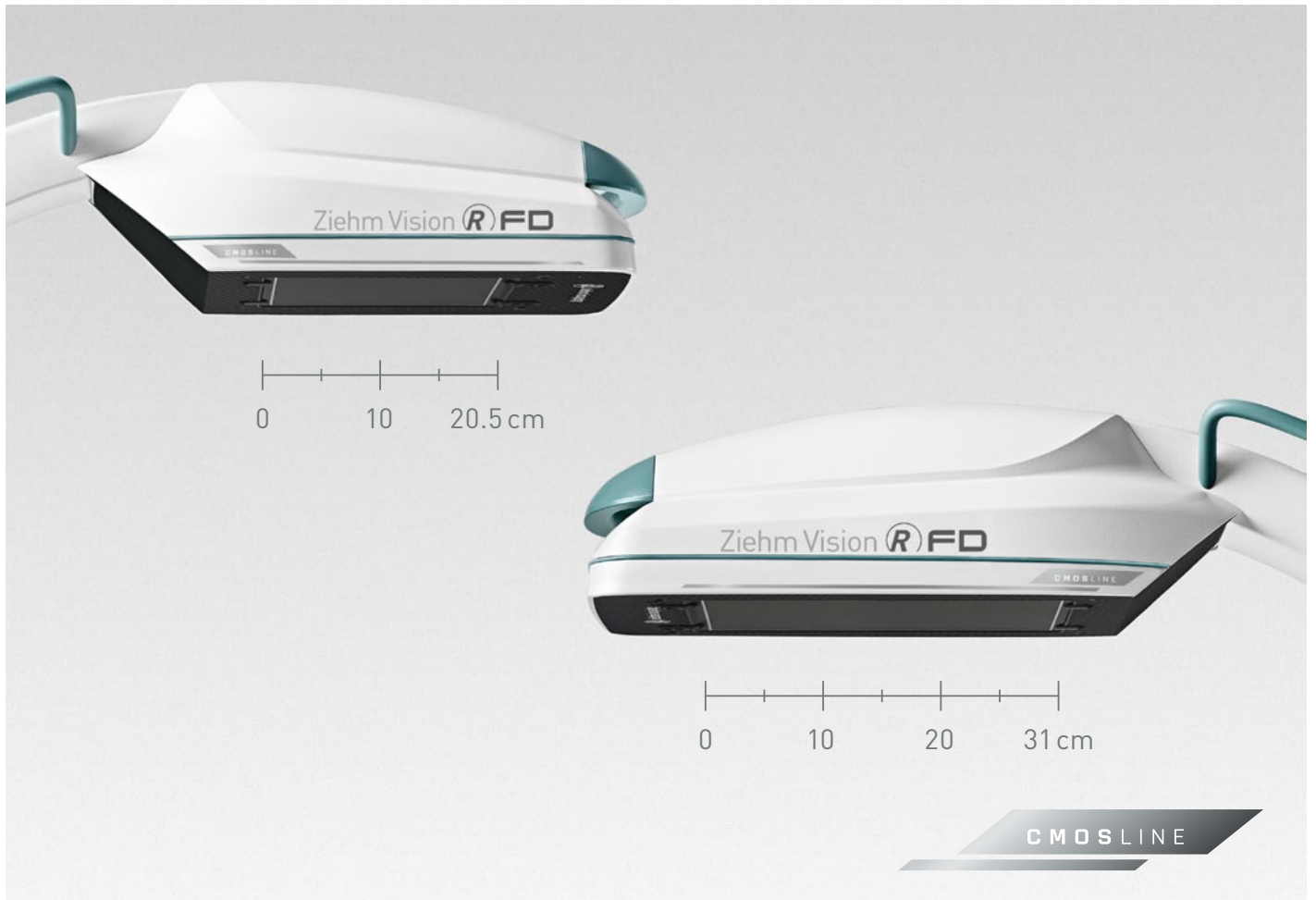
Ziehm Vision RFD. The treatment of cardiovascular and degenerative musculoskeletal conditions calls for high performance intraoperative imaging technologies. Incorporating the latest CMOS technology for excellent image quality, the Ziehm Vision RFD is the ideal product. In addition to the cardiovascular-focused 20.5 cm x 20.5 cm flat-panel version, the Ziehm Vision RFD is available with a 31 cm x 31 cm CMOS flat-panel detector. This is the preferred model for highly demanding orthopedic, trauma or cardiovascular interventions that require more information in one image. Both systems are equipped with a powerful generator for optimum penetration, Advanced Active Cooling to enable longer procedures and an intuitive operating concept for high clinical standards.

## 01 / Trust in over 10 years of flat-panel performance now enhanced with CMOS imaging excellence

Building on more than a decade of experience in flat-panel technology, the Ziehm Vision RFD now features the latest CMOS technology. Benefits of this enhancement include clear visualizations, lower noise levels and high spatial resolution for optimal soft tissue and bone contrast. These innovative improvements make the Ziehm Vision RFD ideal for challenging procedures in cardiovascular interventions and orthopedic, spine and trauma surgery.

### → CMOS flat-panel technology

The Ziehm Vision RFD CMOSline<sup>2</sup> integrates the innovative detector technology for two specialized detector sizes. With the choice of 20.5 cm and 31 cm flat-panels, the mobile C-arm provides comprehensive information with each examination, previously capable only with fixed room systems. CMOS technology achieves higher spatial resolution due to a smaller pixel size combined with lower noise levels and a higher read-out speed at full resolution. With CMOS technology true resolution, especially in magnification modes, makes interpolation unnecessary and improves overall efficiency. In addition, the Ziehm Vision RFD CMOSline<sup>2</sup> now comes with newly developed dose saving technology: Beam Filtration<sup>1</sup> supports the latest improvements in Ziehm Imaging's enhanced CMOS imaging chain, enabling an exceptional skin entrance dose reduction.<sup>4</sup> Because of these innovations and CMOS technology, the Ziehm Vision RFD CMOSline<sup>2</sup> provides excellent image quality with a lower dose.



### → Contrast-rich display

To meet the highest OR demands and provide crystal-clear X-ray images, the Ziehm Vision RFD incorporates dual 19" diagnostic flat screen monitors that offer exceptional brightness and contrast even at a distance. With Wireless Video there are fewer cables in the OR and the ability to transfer live X-ray images to external monitors.

The Ziehm Endo Package is a unique configuration designed in cooperation with clinicians to optimize minimally invasive endoscopy procedures (e.g. ERCP) under fluoroscopic X-ray control. A 26" color monitor enables the combined display of the X-ray image and the live endoscopic image side by side. The surgical team gains more space as a separate endoscopy monitor becomes unnecessary.

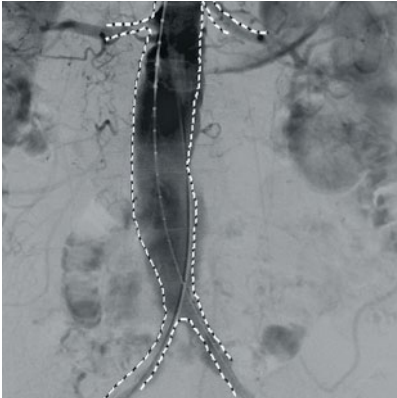
### → Comprehensive tools to support optimal image quality

SmartVascular offers a specialized workflow to meet the needs of complex vascular procedures. This innovative software allows switching between Fluoro, DSA, MSA and road mapping (RSA) with just one click and enables surgeons to perform an RSA from a single DSA image. In addition, SmartVascular features a dedicated footswitch configuration for specialized needs.

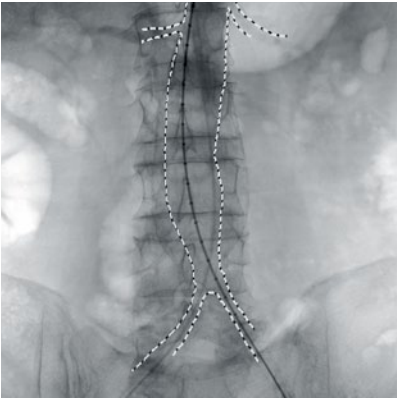
The Anatomical Marking Tool (AMT) enables the user to apply markings and left/right labels to live images using the touchscreen. AMT also allows marking of blood vessels, branches or implant positions on live images.

Contrast medium imaging with CO<sub>2</sub> is an innovative alternative for mobile C-arms. In addition to conventional iodinated contrast, it displays MSA and road mapping (RSA) without allergic reactions in patients and at a lower cost.





DSA: Marking of the aneurysm and the aortic branches with the AMT.



Marking stays in place during stent placement.



DSA control: successful placement of the stent.

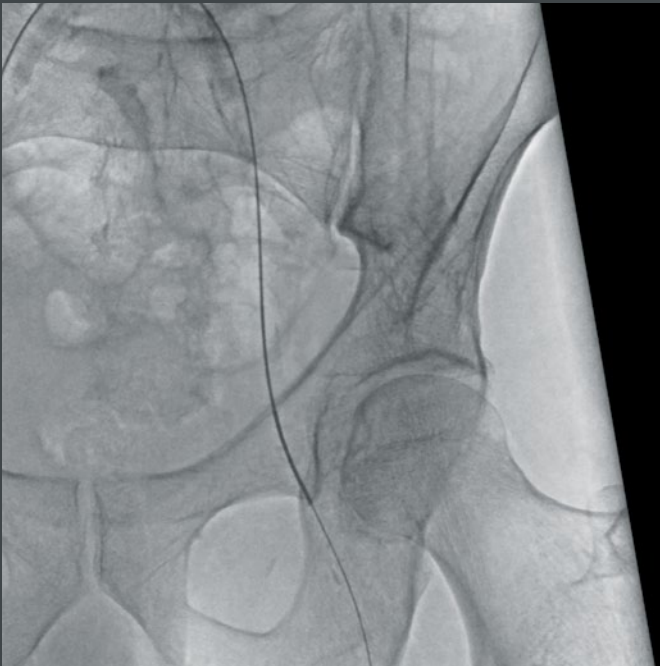


Versatile viewing options offer maximum flexibility in the OR.



Vascular extremities

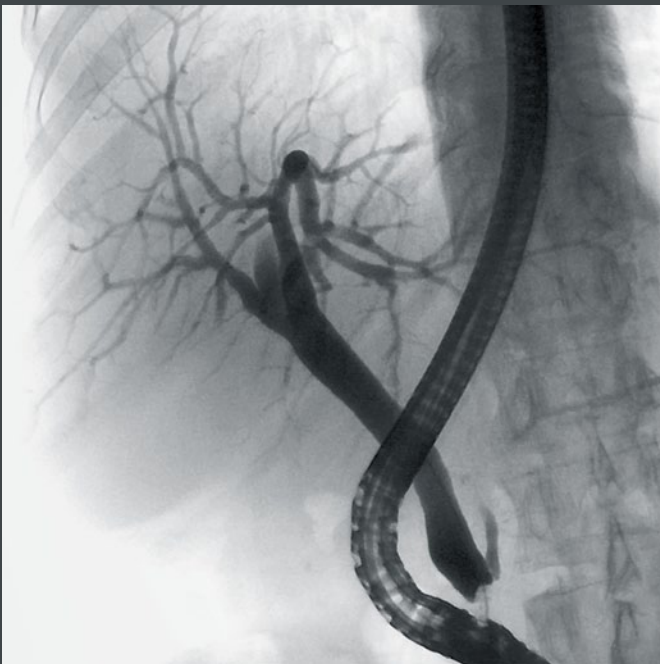




Pelvis



Endovascular aneurysm sealing



Endoscopic retrograde cholangiopancreatography (ERCP), native



Abdominal aortic aneurysm

## 02 / Unlock the power to perform with advanced generator and cooling technology

A powerful 25 kW monoblock generator for optimum penetration provides ideal support for surgeons. Advanced Active Cooling keeps the generator at a consistent operating temperature and prevents system failure due to overheating, making the Ziehm Vision RFD a reliable and safe choice for complex procedures.

### → Compact and powerful

This 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 systems deliver excellent results even during exposures with steep angles and lateral projections. The small housing of the compact and powerful generator further simplifies its positioning at the OR table.

### → Advanced Active Cooling

The unique liquid cooling system Advanced Active Cooling (AAC) supports the mobile C-arm during lengthy, demanding procedures. Even during complex applications such as TAVI, angioplasties and EVAR, the Ziehm Vision RFD delivers reliable results throughout 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.



## 03 / Deliver advanced surgical care with the Ziehm Usability Concept<sup>3</sup>

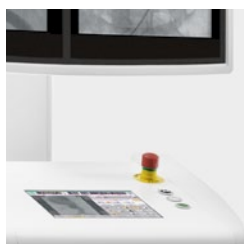
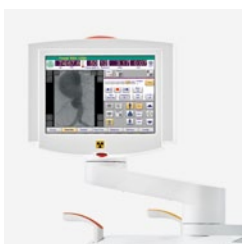
Best-in-class ergonomics pave the way for an ultra intuitive operating experience, enabling consistent, high quality outcomes. With an orbital movement of 165 degrees for easier patient coverage and the Wireless Freedom Concept for added operational safety and flexibility, the Ziehm Vision RFD raises the bar for procedural efficiency.

### → Best-in-class ergonomics

With a footprint of 8.6 sq ft, the Ziehm Vision RFD is one of the most compact mobile C-arms on the market. With its easy drive system it 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. In addition, different colored scales and handles allow the surgeon and staff to quickly and simply select the desired function.

### → Intuitive user interface

The Vision Center is a rotating and tilting touchscreen control panel mounted on the mobile stand as well as on the monitor cart and, optionally, directly at the OR table or on a separate trolley. Up to three synchronized user interfaces offer the entire range of functions on both units. The wizard guided workflow, coupled with clear and easy to follow icons, supports an intuitive operation of the imaging system. With SmartArchive, it has never been more convenient and faster to access the current patient folder at any time.



Easy access even from the sterile field

Ziehm SmartEye technology mirrors the live image on the touchscreen, enabling the operator to keep track of orientation and object position.

A white Ziehm Vision R C-arm X-ray machine is shown in a curved position. The machine has a large, dark, rectangular detector panel on the left side, which is labeled 'Ziehm Vision R' and 'RFD'. The right side of the machine is a lighter-colored, curved arm. A teal-colored cable is attached to the bottom of the arm. The machine is positioned against a white background.

33"  
C-ARM  
OPENING

A diagram showing a 165-degree arc, representing the range of motion for the C-arm. The arc is composed of many small, teal-colored lines radiating from a central point, forming a semi-circle.

165°  
FOR EASIER  
PATIENT  
COVERAGE

#### Easy handling

The 165 degrees of orbital movement and an 33" C-arm opening provide ideal support for clinical workflows.

### → Ziehm Usability Concept<sup>3</sup>

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<sup>3</sup>. Seamlessly integrated workflows offer unmatched levels of usability – anytime, anyplace.

As the innovation and technology leader, Ziehm Imaging has developed the sophisticated and intuitive Ziehm Usability Concept<sup>3</sup> 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



**MOST COMPACT  
FOOTPRINT WITH  
8.6 SQ FT**  
to fit in even the smallest  
treatment scenarios



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



**ZIEHM VISION CENTER**  
featuring an intuitive  
touchscreen user interface



**SMART EYE**  
enabling users to keep  
track of orientation and  
object position



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



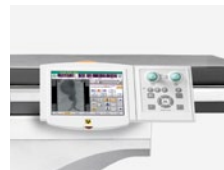
**WIRELESS DUAL-  
PLUS FOOTSWITCH**  
to control all imaging functionalities  
without any disturbing cables



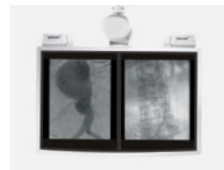
**ZIEHM NETPORT**  
with WLAN enables easy  
integration into IT networks



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



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



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

## 04 / Reduce exposure significantly with the next-generation SmartDose<sup>4</sup>

The Ziehm Vision RFD is designed to meet growing demand among surgeons and their staff for minimized dose exposure without compromising 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 adjustment of dose exposure.<sup>4</sup> Our latest improvements in SmartDose<sup>4</sup> help to display even the smallest details of complex anatomical areas and reduce dose with intelligent pulse regulation and optimized anatomical programs. Furthermore, dedicated SmartDose<sup>4</sup> functions significantly reduce exposure in pediatric surgery<sup>5</sup>.

### → Beam Filtration<sup>1</sup> for reduced skin entrance dose

Our next-generation SmartDose<sup>4</sup> concept now includes Ziehm Imaging's groundbreaking Beam Filtration<sup>1</sup> 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<sup>2</sup> systems.<sup>1,4</sup> This innovative technology, included in the premium line of Ziehm Imaging C-arms, provides excellent image quality with a lower dose.<sup>1,4</sup>



## 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



**ANATOMICAL PROGRAMS**  
with automatic optimization of dose and image quality for best results



### LOW DOSE MODE

in all anatomical programs for particularly dose-sensitive procedures, e.g. in pediatrics<sup>5</sup>



### REMOVABLE GRID

to reduce dose in pediatric and other dose-sensitive procedures



### REDUCTION OF PULSE FREQUENCY

manually or fully automatically to lower the accumulated dose



### HIGH-SPEED ADR

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



### PREMAG

for exposure-free magnification of X-ray images



### VIRTUAL COLLIMATORS

for exposure-free positioning of collimators



### OBJECT DETECTED DOSE CONTROL (ODDC)

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



### ZAIIP ALGORITHM AND FILTERS

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



### AUTOMATIC ADJUSTMENT

for large patients – with no additional increase in dose



### BEAM FILTRATION<sup>1</sup>

for reduced skin entrance dose without compromising on image quality



- <sup>1</sup> 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.
- <sup>2</sup> CMOSline represents a system configuration that is based on a Ziehm Imaging CMOS flat-panel detector.
- <sup>3</sup> The Ziehm Usability Concept includes all mentioned features on page 15. Due to regulatory reasons the availability of each feature may vary. Please contact your local Ziehm Imaging partner for detailed information.
- <sup>4</sup> The SmartDose concept includes all mentioned features on page 17. Due to regulatory reasons the availability of each feature may vary. Please contact your local Ziehm Imaging partner for detailed information.
- In clinical practice, the use of SmartDose may reduce patient dose depending on the clinical task, patient size, anatomical locations, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.
- <sup>5</sup> Gosch D. et al. "Influence of the grid and ODDC on radiation exposure and image quality using mobile C-arms – First result," RöFo, 09/07

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