



SETTING THE  
STANDARD IN  
**3D IMAGING**

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ZIEHM VISION RFD 3D

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## THE REVOLUTION IN 3D IMAGING

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Ziehm Imaging has more than 10 years of experience in 3D imaging solutions. Our C-arms offer 2D and 3D functionality in one device enabling comprehensive, intraoperative control that reduces the need for postoperative CT. This makes it possible to raise quality levels and gives peace of mind even in demanding procedures. Rates of cost-intensive revisions can be reduced significantly. Surgeons and hospitals can profit from better surgical outcomes and therefore a larger number of satisfied patients.

The new flagship Ziehm Vision RFD 3D has been specifically developed for high-end procedures in orthopaedics, trauma and spinal applications. Thanks to our latest technical highlight, SmartScan, it is possible to generate a complete 3D cubical dataset with 16 cm edge length, while keeping the design of a conventional C-arm, and profit from the advantages of a variable isocenter.

Ziehm Vision RFD 3D is the first C-arm on the market that works with flat-panel technology and provides this level of outstanding 2D imaging as well as the complete 3D information during clinical interventions.

COMPLETE

# 3D

INFORMATION



## REMOTE CONTROL

Position Control Center and Remote Vision Center: full control of the procedure directly from the sterile field.



wireless

## WIRELESS VIDEO

Transfer of images to external monitors or to the PACS.

## 19" TFT MONITORS

bright, high-contrast images and cine loops, displayed with a wide viewing angle.



## ITERATIVE 3D ALGORITHM

CT-like reconstructions with Ziehm Iterative Reconstruction (ZIR).

## ADVANCED ACTIVE COOLING

for extended fluoroscopy time in most demanding procedures.

## COMPLETE 3D INFORMATION

for full intraoperative control in the OR.



## 30 x 30 FLAT-PANEL

30 cm x 30 cm flat-panel detector for distortion-free imaging.

## SMART SCAN

Patented scan enables 180° image acquisition.

## 25 kW GENERATOR

Powerful generator with up to 25kW electrical power for improved penetration of dense anatomy – such as obese patients in lumbar spine surgeries.

01. IMAGE QUALITY

# ALL INFORMATION RIGHT IN TIME

On average, 40 % of calcaneus and 10 % of spinal implants are not placed in the optimal position.\* With Ziehm Imaging's C-arms, detail-rich 2D images give precise information from any angle during a procedure. In combination with complete 3D information in CT-like quality, surgeons can intraoperatively control the clinical outcome of their intervention and check the results of their surgical strategy. They can react immediately and don't have to wait for results of a postoperative CT scan. This helps to avoid unnecessary revisions.



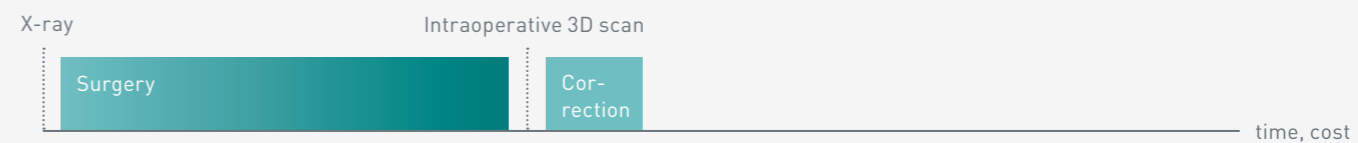
## MORE EFFICIENCY IN CLINICAL WORKFLOWS

Studies prove: up to 97.1 % of thoracolumbar pedicle screw misplacements can be detected intraoperatively\*\* – providing a great opportunity to raise efficiency in clinical workflows.

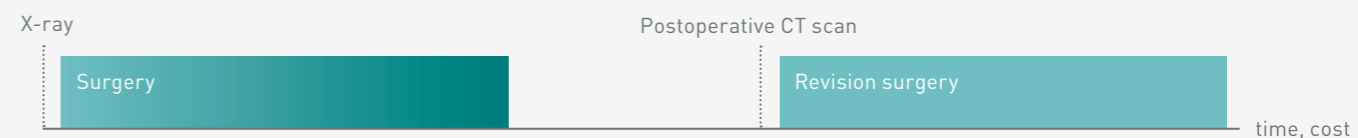
\*\* J. von Recum, K. Wendl, B. Vock, P. A. Grützner, J. Franke, "Die intraoperative 3D-C-Bogen-Anwendung. State of the art." Der Unfallchirurg, 3/2012, Page 196 – 201.

\*\* M. Beck, K. Moritz, P. Gierer, G. Gradl, C. Harms, T. Mittlmeier, "Intraoperative Control of Pedicle Screw Position using Three-Dimensional Fluoroscopy. A Prospective Study in Thoracolumbar Fractures." Zeitschrift für Orthopädie und Unfallchirurgie, 2009, Page 37 – 42.

### INTRA- OPERATIVE

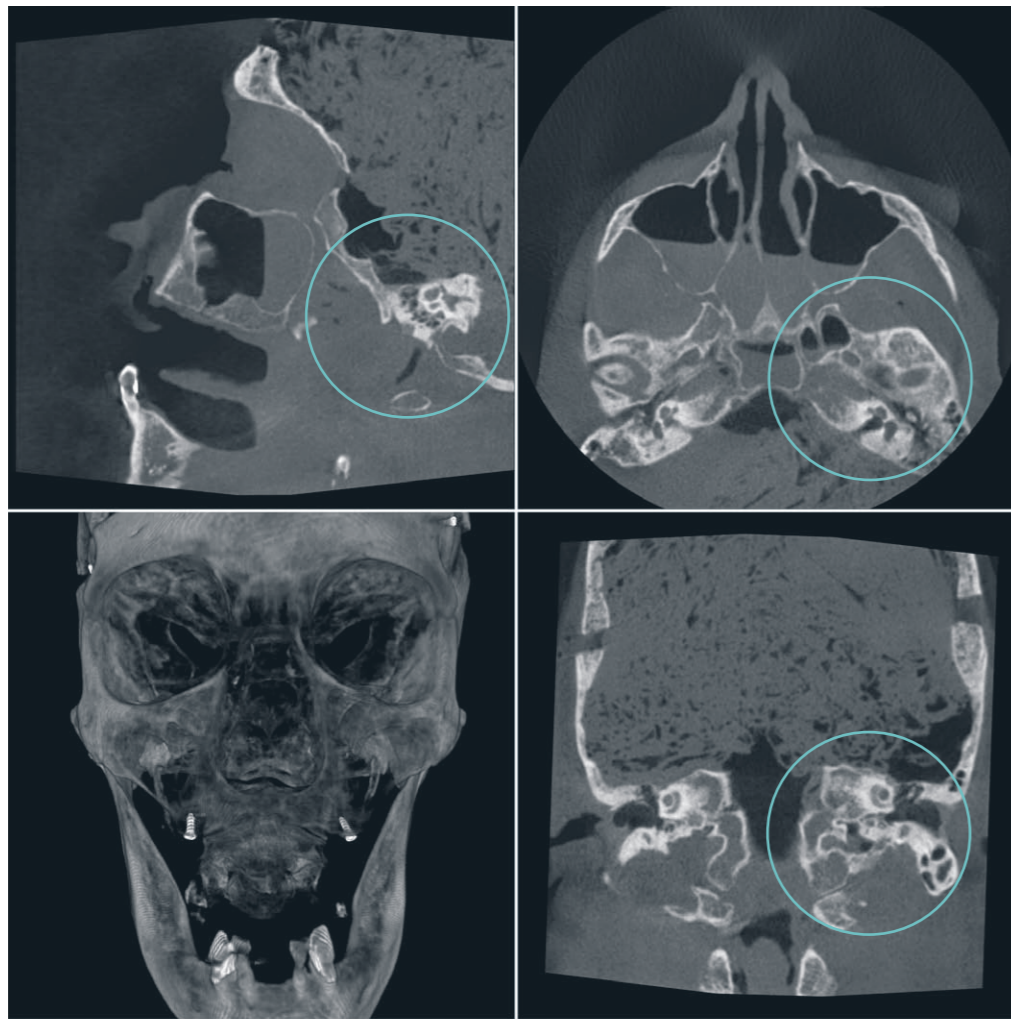


### POST- OPERATIVE

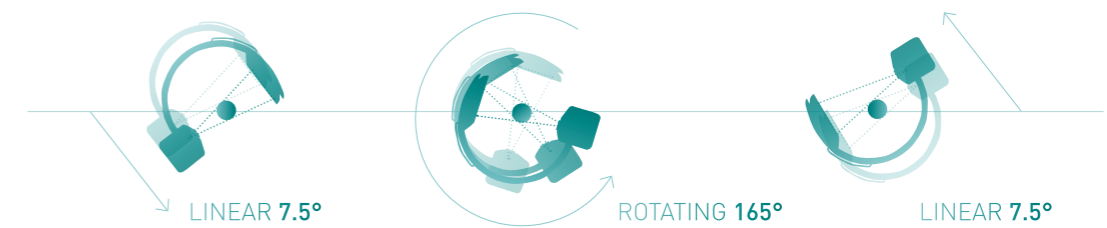


### COMPLETE 3D INFORMATION WITH FLAT-PANEL TECHNOLOGY.

Powerful generator performance combined with flat-panel technology provides exceptional 3D information. Due to Ziehm Imaging's unique scanning technique and iterative reconstruction, Ziehm Vision RFD 3D offers anatomical information in CT-like reconstructions.



### 180° SCAN FOR COMPLETE 3D INFORMATION



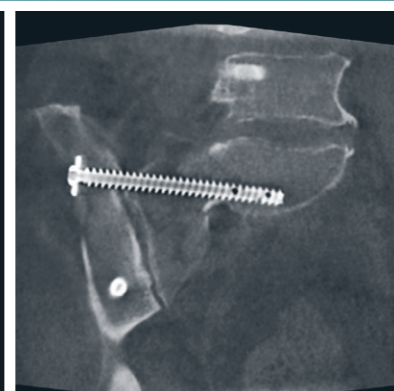
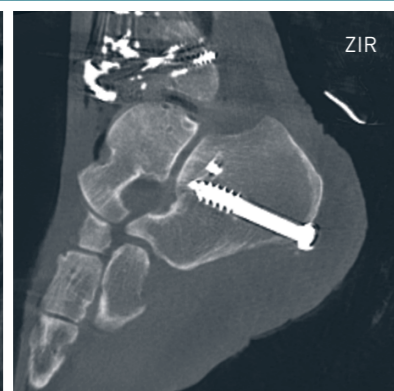
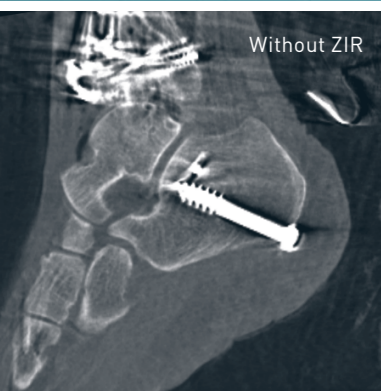
**PATENTED SMARTSCAN.** 180 degree scan is required to create a complete, informative 3D dataset. Ziehm Imaging's SmartScan is a revolutionary concept that enables Ziehm Vision RFD 3D to generate the complete 3D information of even the smallest anatomical structures while keeping the geometry of a conventional 2D C-arm. The intelligent combination of linear and rotating movements enable 180 degrees of scanned information – at every point in the field of view. With this dataset, procedures can be assessed intraoperatively: Fine details, like cortical rims, pedicle diameters or even orbital floor, are optimally visualized.

With this benchmarking enhancement, surgeons can create full 3D datasets while retaining the benefits of our C-arms: the most compact 3D devices with a 30 cm x 30 cm flat-panel, generous C-arm opening and the advantages of a variable isocenter.



**BENCHMARKING IMAGE QUALITY.** With an edge length of 16 cm x 16 cm x 16 cm (4,096 cm<sup>3</sup>) Ziehm Imaging's C-arms currently offer the largest 3D scan volume on the market. Up to 7 cervical vertebrae can be displayed, for example, in vertebral fusions over several levels. Due to CT-like image quality with up to 320 voxels, our 3D C-arms can visualize even the finest anatomical details of bone structures. Ziehm Vision RFD 3D is thus ideally suited to demanding orthopedic, trauma or spinal procedures.

**MINIMIZED ARTIFACTS BY ITERATIVE RECONSTRUCTION.** The specially developed algorithm ZIR (Ziehm Iterative Reconstruction) optimally minimizes fan and metal artifacts in 3D reconstructions. Additionally, this new technology leads to significantly more distinguishable anatomy, defined bone crests and optimum slice views in the coronal, axial, sagittal and individually adjustable planes.



# ZIR

ELIMINATES  
ARTIFACTS

**HOMOGENEOUS, NOISE- AND ARTIFACT-FREE IMAGES**  
Imaging in applications with an increased amount of metal implants, e.g. shoulder or calcaneus fractures, can be displayed in high quality with significantly reduced metal artifacts.

**UNIQUE 2D VISUALIZATION.** Ziehm Vision RFD 3D generates high-quality 2D images that support not only orthopedic, trauma or spinal procedures, but also most demanding interdisciplinary hybrid applications – giving you great clinical versatility.

**HIGH DYNAMIC IMAGING.** With over 65,000 shades of gray and the unique Ziehm Adaptive Image Processing (ZAIP), the system provides a highly dynamic image quality that has previously only been available from fixed installed systems. Equipped with a 30cmx30cm flat-panel, Ziehm Vision RFD 3D is a unique imaging solution for highly demanding clinical procedures.

**POWERFUL PENETRATION.** With power reserves of up to 25kW, Ziehm Vision RFD 3D's unique monoblock generator offers the highest image quality even in demanding regions like the cervical-thoracal transition.

**MULTIDISCIPLINARY CAPABILITIES.** By configuring the unit with additional visualization tools and options, like the Interventional Package or SmartVascular Package with DSA, MSA and RSA (roadmapping), the system is even more prepared for interdisciplinary use, especially in hybrid room applications or demanding multi-trauma cases.

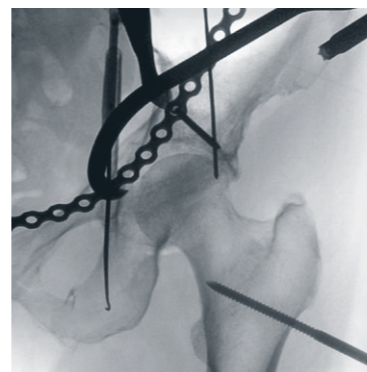
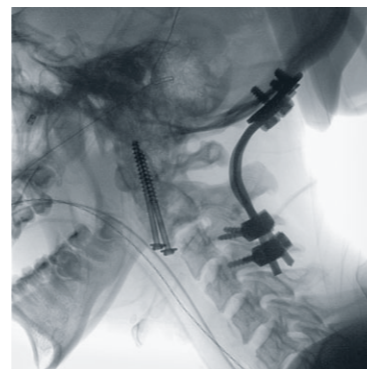
**16 TIMES MORE SHADES OF GRAY** with Ziehm Imaging's flat-panel technology

4,096

Conventional image intensifier

65,536 shades of gray

Ziehm Vision RFD 3D with flat-panel technology



## 02. WORKFLOW

## SUPPORTING YOUR CLINICAL PROCEDURES.

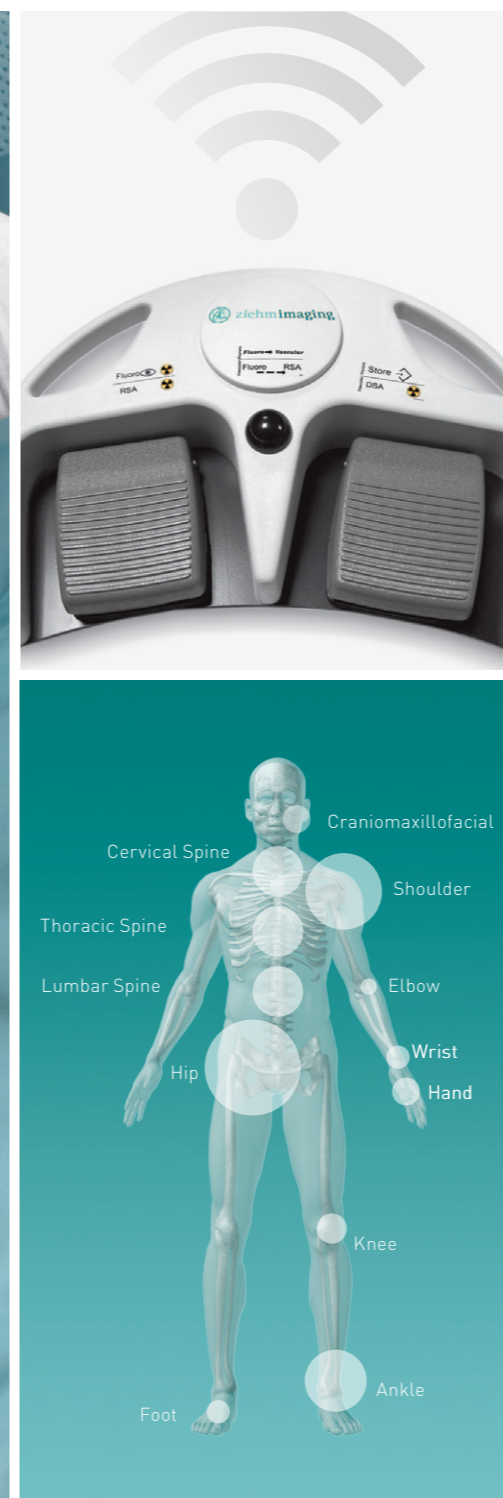
Ziehm Vision RFD 3D enhances your daily OR routine. With the wizard-guided workflow and the intuitive user interface, the system will easily lead you through your imaging procedures and help you to save valuable OR time.

**UNBEATABLE FLEXIBILITY.** Our 3D C-arms are significantly smaller than fixed C-arms and around 60% lighter than mobile CTs. Ziehm Vision RFD 3D can be easily positioned during all kinds of procedures and can effortlessly be brought from one room to another. The great mobility keeps you flexible in planning your OR schedule and reacting in unforeseen situations. With OR personnel constantly changing, the surgeon can now work completely independently as he can operate Ziehm Vision RFD 3D by himself directly from the sterile field.

**EASY POSITIONING.** With Ziehm Imaging's flat-panel technology, the large C-arm opening simplifies positioning the system at the table. Intelligent scan paths that are based on the variable isocenter enable a collision-free scan around the patient on the OR table.





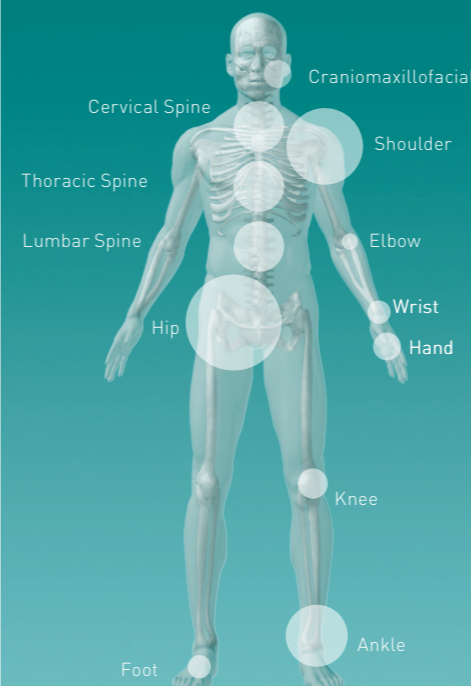


**PRECISE AND TIMESAVING.** The C-arm, including control of the 4 motorized axes, can be operated entirely in the sterile field. Operators can use either the Position Control Center or the Remote Vision Center to move the C-arm into the exact position desired. They can easily save and recall up to 3 positions, for example to switch between the AP, lateral and oblique position. This saves time and increases precision.

**PATIENT SAFETY.** Patient safety is always top priority. Ziehm Vision RFD 3D can be configured 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 defined safety zone.

**WIRELESS FREEDOM.** The optional wireless video package increases flexibility: Live images from the monitor cart can be transmitted to ceiling- or wall-mounted monitors in real-time as well as from the system into the hospital PACS. The optional wireless footswitch further increases safety as there are fewer cables on the OR floor.

**Z-CONFERENCE.** Z-Conference enables getting a colleague's advice in your surgery room. With the integrated video server, live images can be streamed within the hospital network. Z-Conference supports bi-directional voice transmission: colleagues can communicate with the surgeon in the OR right from their office PC via headset.






## 03. SMART DOSE


## BEST IMAGE QUALITY. MINIMUM DOSE.


SmartDose is a comprehensive concept for dose reduction. With a number of intelligent hardware and software solutions, the dose can be significantly lowered while keeping the same high image quality.


 **SmartDose**  
Best image quality. Minimum dose.


 **LASER POSITIONING DEVICE**  
integrated in flat-panel and generator housing and remotely operable.

 **ORGAN PROGRAM**  
anatomically adjusted and dose-optimized for best results.

 **LOW DOSE MODE**  
pediatric key for all organ programs.

 **REMOVABLE GRID**  
for pediatric and further dose-sensitive procedures.


 **REDUCTION OF PULSE FREQUENCY**  
from 1 – 25 pulses per second manually or automatically.

 **PREMAG**  
exposure-free display of magnified X-ray image.

 **VIRTUAL COLLIMATORS**  
exposure-free positioning of collimators.

 **MOTION AND OBJECT DETECTION**  
automatically with ODDC.

 **AUTOMATICALLY ADJUSTED COLLIMATORS**  
positioning of collimators during 3D Scan.

 **AUTOMATIC LPK**  
automatic adjustment for obese patients without dose increase.

**AUTOMATIC ADJUSTMENT OF SETTINGS.** Ziehm Vision RFD 3D greatly simplifies patient positioning and dose control. ODDC (Object Detected Dose Control) places a matrix over the entire field of view and uses 256 measurement cells to analyze the position of the anatomy. All settings are automatically adjusted in real time – from dose to noise reduction.

ODDC's measurement cells detect motion and adapt pulse frequency automatically. If the patient is not moving, the pulse frequency can be lowered significantly. Furthermore, the system detects metal objects in the field of view and automatically adjusts generator output and video levels to reduce metal distortion and therefore significantly improves image quality.

# OVERVIEW

**OPTIMAL SOLUTIONS.** Ziehm Imaging's C-arms set international benchmarks. With a multitude of options, they can be specifically tailored to your needs, making it the ultimate C-arm for any requirement.

**SERVICE.** Regardless of your needs, our experts are on hand. You can always rely on Ziehm Imaging for flexible and fast service. With Ziehm Remote Service, our new remote support solution, we deliver faster and easier problem solving and optimize your system's uptime.

**TRAININGS.** With Ziehm Academy you can enhance your clinical knowledge, find out more about mobile C-arms and benefit from tailored training.



We would be pleased to consult with you personally. Please scan to give us a call.

ZIEHM VISION RFD 3D



ZIEHM VISION FD VARIO 3D



ZIEHM VISION VARIO 3D



## FEATURES

Flat-panel	30 cm x 30 cm	20 cm x 20 cm	-
Image intensifier	-	-	23 cm
Power of pulsed monoblock generator	25 kW	2 kW	2 kW
Open navigation interface	■	■	■
Position Control Center	■	-	-
Scanned information	180°	135°	135°
Edge length	16 cm x 16 cm x 16 cm (4,096 cm³)	12.8 cm x 12.8 cm x 12.8 cm (2,097 cm³)	12.8 cm x 12.8 cm x 12.8 cm (2,097 cm³)

## CLINICAL APPLICATIONS

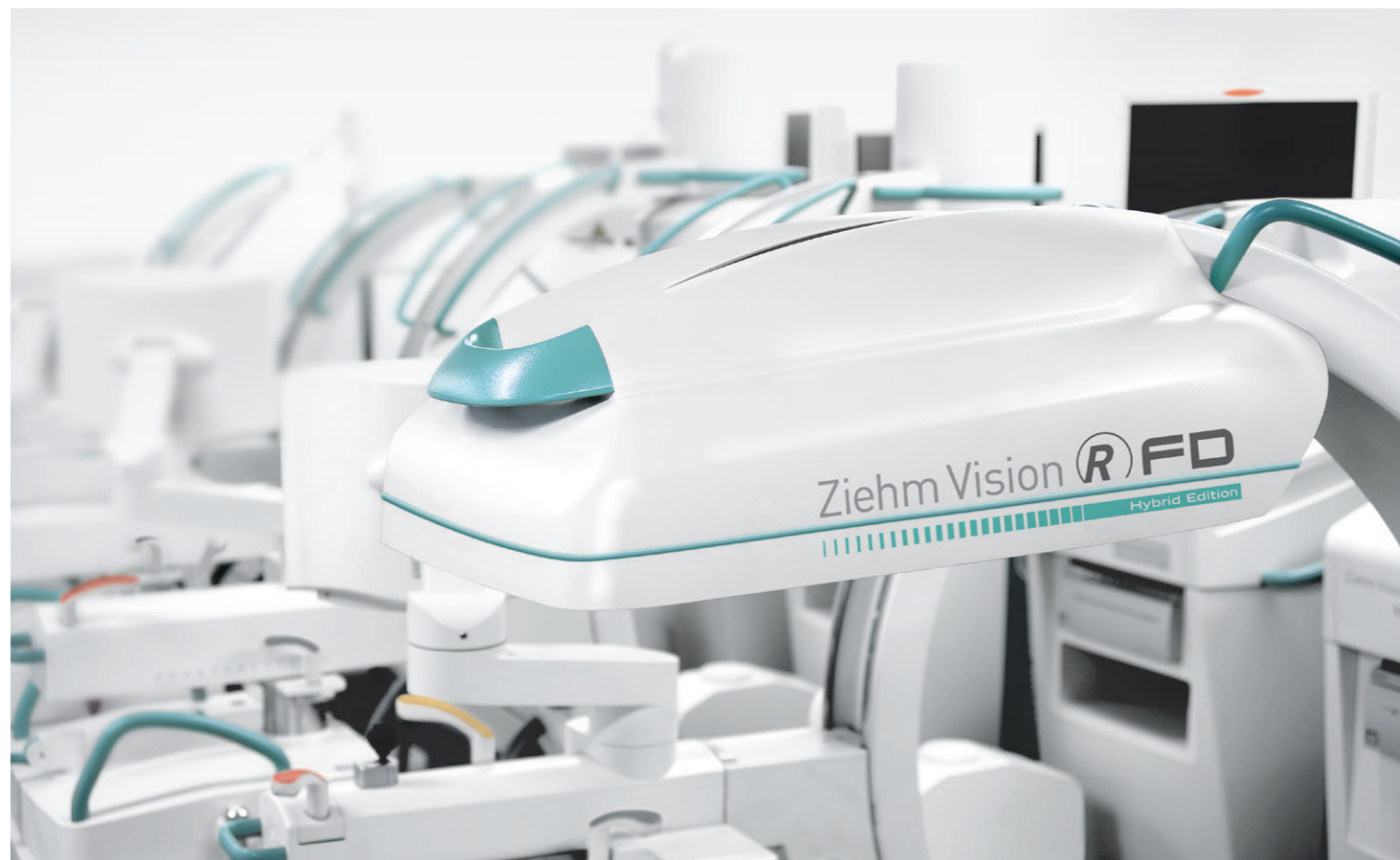
Cervical spine	•••	••	••
Thoracic spine	•••	••	••
Lumbar spine	•••	••	••
Lower extremities	•••	•	•
Upper extremities	•••	••	••
Pelvis	•••	•	•
Shoulder	•••	••	•
Cranioaxillofacial	•••	•	•
Interventional/hybrid	•••	-	-
Pediatrics	•••	•••	•••

available ■ | not available - | good • | very good •• | ideal •••

# ZIEHM IMAGING THE C-ARM SPECIALIST

With technology "Made in Germany", we have become a market leader for mobile C-arms – in Germany and other European countries. Today, Ziehm Imaging is a global systems provider, employing over 400 people worldwide. Building on competence and creativity, a continuous dialogue and close cooperation with partners, we are elevating the boundaries of mobile X-ray imaging. This is why we can provide best solutions to meet your specific clinical demands.

Ziehm Imaging has received several awards for its groundbreaking technologies, including the iF Design Award 2011, Frost & Sullivan Award 2006, 2007, 2009 and 2011, Stevie Award For Sales & Customer Service 2013 and Best New Product Award 2014.



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- 5 Shanghai (China)
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