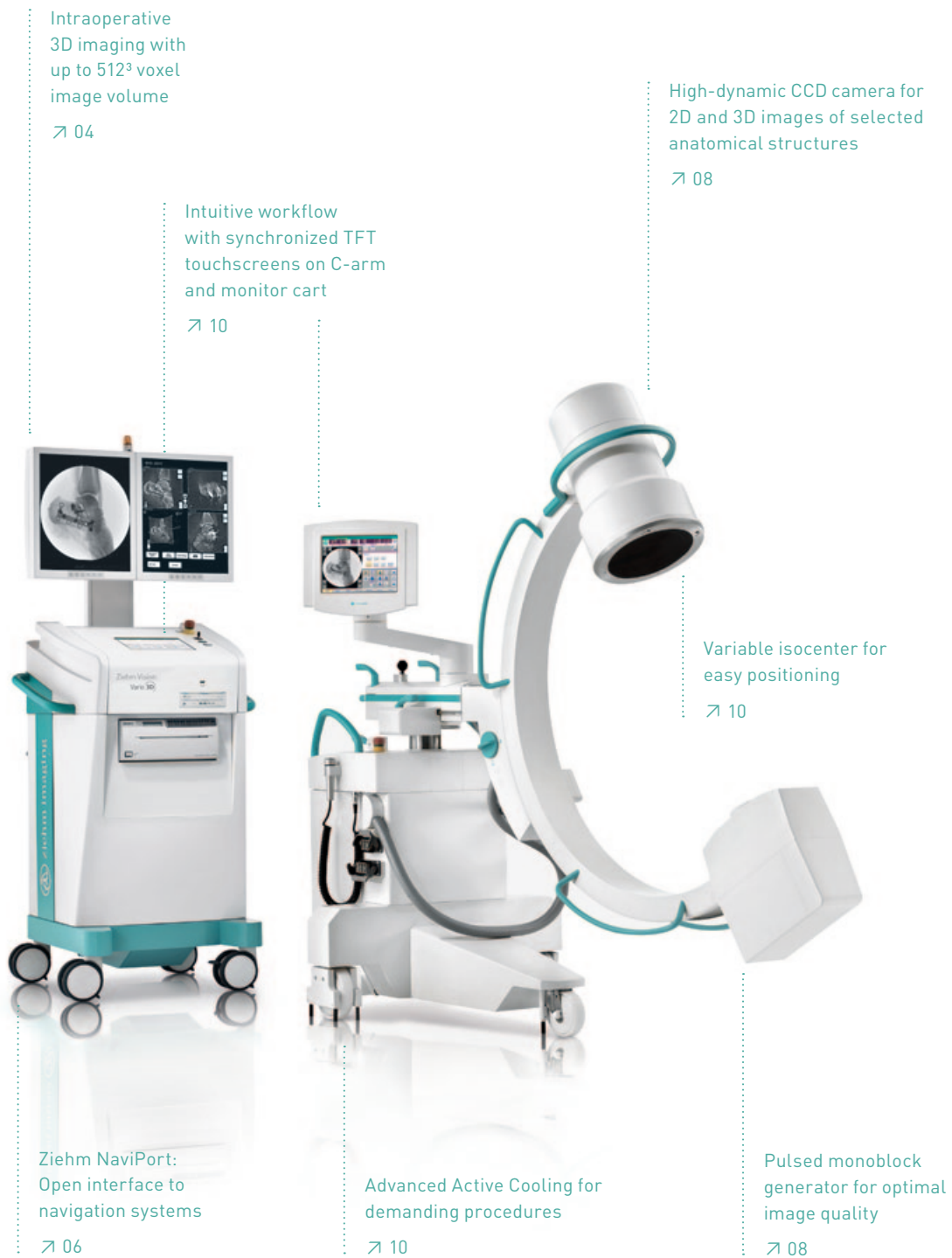


Ziehm Vision (FD) Vario 3D  
Exceptional 2D and 3D imaging  
with smallest footprint

→ Flat-Panel Detector

→ Image Intensifier



Ziehm Vision Vario 3D. This C-arm combines excellent 2D image quality with a highly efficient intraoperative 3D imaging module. The fully automatic 3D scan saves time and helps increase precision and safety levels by delivering volume renderings and CT-like slices. Combined with navigation systems, the C-arm is particularly suited to orthopedics as well as trauma- and neurosurgery. Its intelligent, compact and space-saving design result in better patient access and unmatched ease of use. Ziehm Vision Vario 3D benefits surgeons, medical staff and patients alike.

## The new benchmark. 3D imaging with flat-panel technology.

### → Larger opening

Measuring 89.5cm, the larger C-arm opening allows patients to be more easily positioned and accessed.

### → Distortion-free imaging

The world's first 3D C-arm with flat-panel technology enables fully digital, distortion-free imaging and increases precision and safety levels. In addition, insensitivity to magnetic fields gives the operator added flexibility.

### → High-dynamic images

Due to its high-dynamic range, the flat-panel detector enables optimal concurrent soft tissue and skeletal imaging with more than 16,000 shades of gray.

### → Larger field of view

Thanks to the panel's larger surface and square shape, the resulting 2D images are larger than those generated by conventional image intensifiers.

Compared field of view of flat-panel and conventional image intensifier

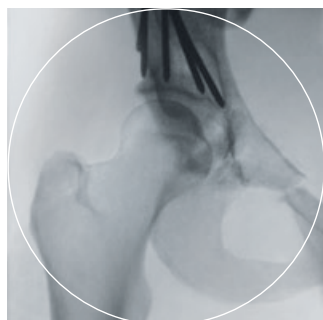
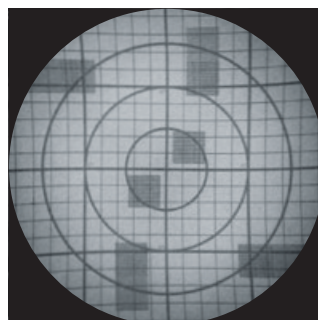
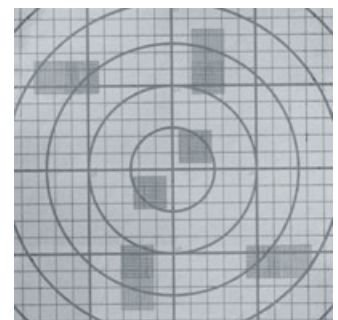


Image intensifier with S-shaped and pincushion distortion



Flat-panel with distortion-free image



High-dynamic  
images with more  
than 16,000 shades  
of gray

➤ 08



Fully digital flat-panel  
technology for image  
acquisition with  
exceptional quality

➤ 08



89.5 cm C-arm  
opening for  
easy handling

Flat-panel highlights:

- Larger opening
- Distortion-free imaging
- High-dynamic images
- Larger field of view

## 01 / Intraoperative 3D imaging. Immediate control for more precision and efficiency.

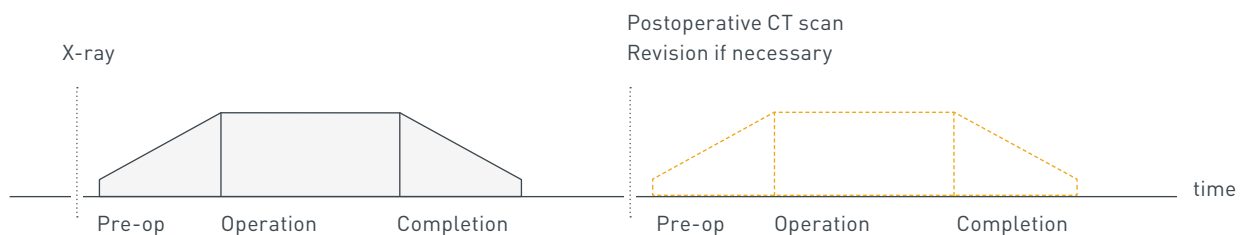
### → More information for increased safety

3D imaging is becoming increasingly popular in modern surgery as it gives surgeons more detailed information. This degree of detail is especially important for placing screws and repositioning fractures. By delivering volume renderings and slice views similar to those associated with CT scans, 3D imaging systems from Ziehm Imaging enable surgeons to perform procedures with the highest possible accuracy. Surgeons can then use this information to make immediate adjustments, such as repositioning screws. The ability to monitor progress on the fly helps surgeons ensure successful procedures, reduces the risk of hospitals having revisions and spares patients the need for another operation.

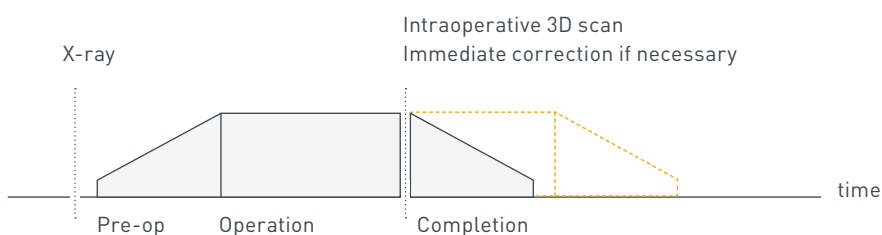
### → Mobile 3D imaging makes CT scans redundant

Clinical studies prove that intraoperative scans using Ziehm Imaging 3D C-arms with an image volume of up to 512<sup>3</sup> voxels clearly show the position of pedicle screws. This enables surgeons to immediately modify incorrectly placed screws without having to wait for a postoperative CT scan.

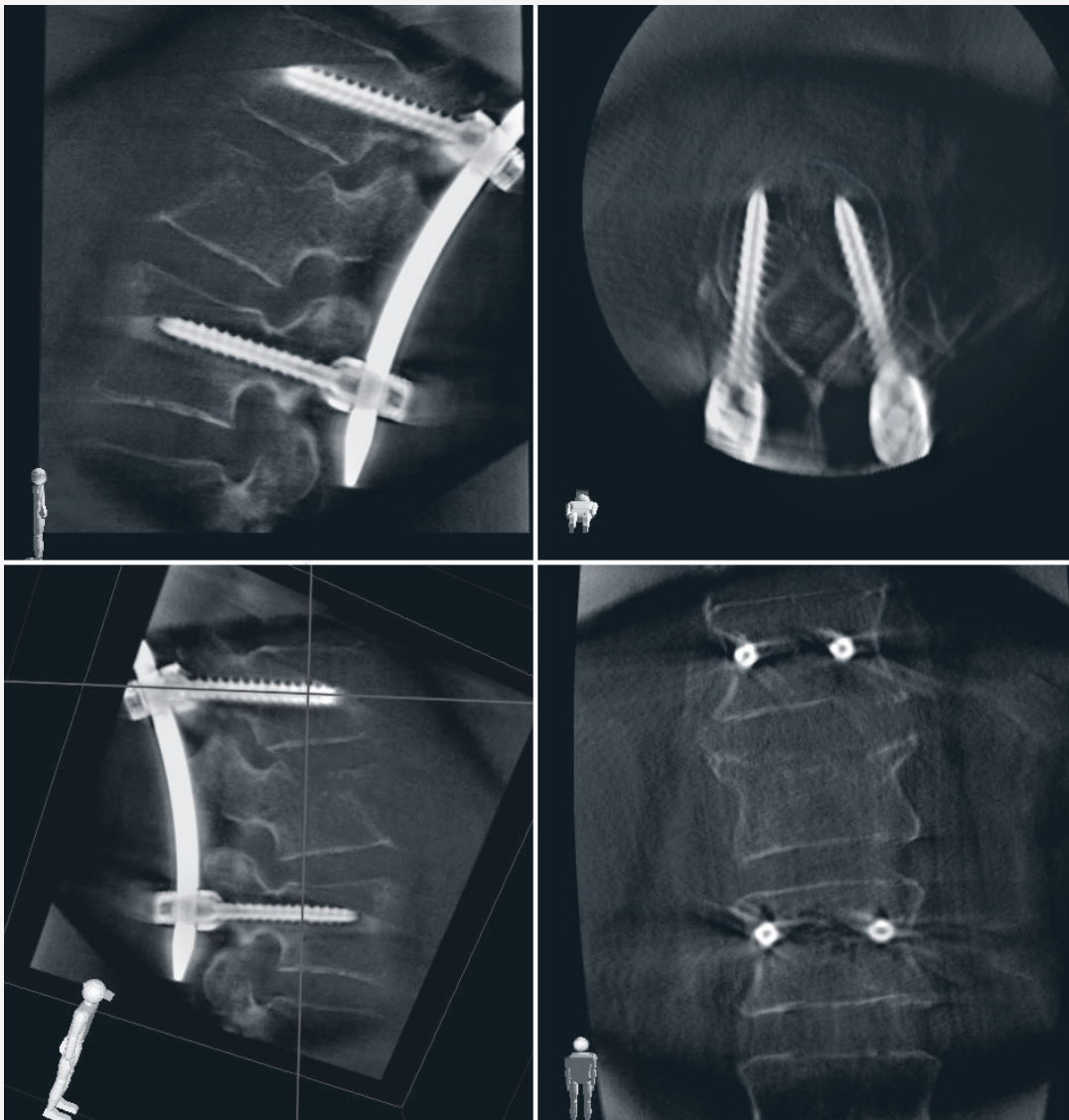
### Workflow without 3D



### Improved workflow with intraoperative 3D imaging







“The need for a preoperative CT scan is eliminated, along with its associated financial and time costs. Incorrect screw placements can be corrected immediately, saving time and avoiding expensive revisions.” Prof. Dr. med. Christoph Josten et al., University of Leipzig, Germany

→ Open for all navigation systems

The Ziehm NaviPort interface links Ziehm Imaging's 3D C-arm for intraoperative imaging with all leading navigation systems. This development enables new levels of quality in image-guided navigation and provides maximum flexibility in choosing navigation systems.

3D image set is automatically transmitted from the C-arm to the navigation software





The reference clamp is attached to the patient's anatomy, and the reference kit is mounted on the C-arm



The navigation system's tracking device detects the markers and identifies the precise position of the patient and C-arm



Ziehm Vision Vario 3D generates a high-resolution 3D scan of the patient



Ziehm Vision Vario 3D generates a 3D scan in the OR for a final check and documentation



Physician performs navigated surgery with the aid of high-resolution 3D data



Ziehm NaviPort transfers the 3D dataset from the C-arm to the navigation system

## 03 / Convincing results. Highest image quality and lowest dose for a broad range of applications.

### → Sharp pulses for sharper images

Ziehm Vision Vario 3D comes with a highly compact monoblock generator. It generates short, sharp pulses with up to 25 frames per second, producing crystal-clear images even if the patient is moving. This intelligent pulse technology also reduces radiation levels, as illustrated below.

### → High-dynamic imaging

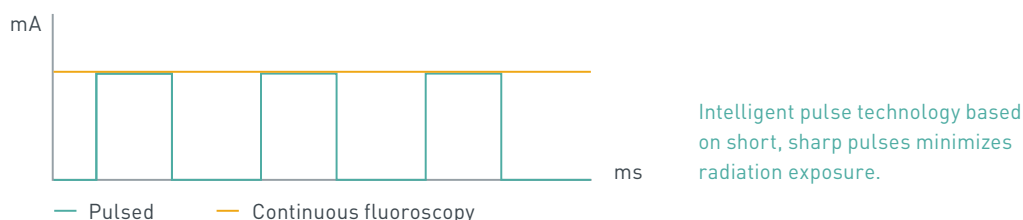
The high-dynamic CCD camera of Ziehm Vision Vario 3D is a key component in the imaging chain. With 1k x 1k resolution and more than 4,000 shades of gray, it visualizes even the smallest anatomical structures. The flat-panel technology of Ziehm Vision FD Vario 3D increases this to more than 16,000 shades of gray for even more detailed images.

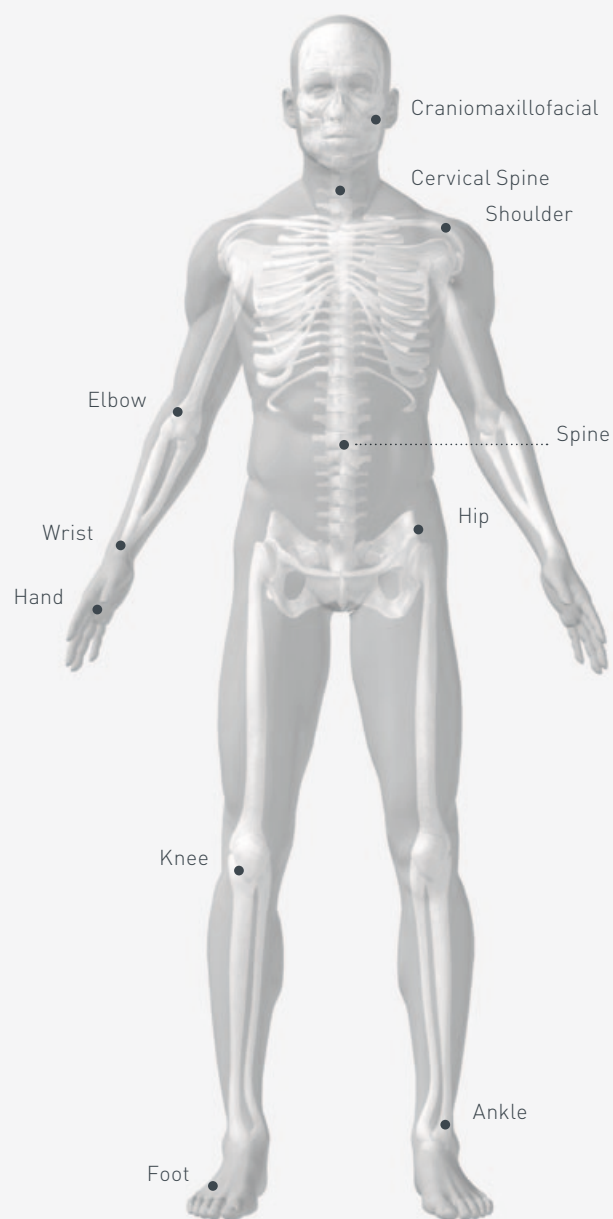
### → Contrast-rich display

Ziehm Imaging's two 18" TFT screens stand out for their exceptional brightness and contrast. Even at a distance, the high-end monitors provide physicians with optimal insights by visualizing the finest details – from every angle.

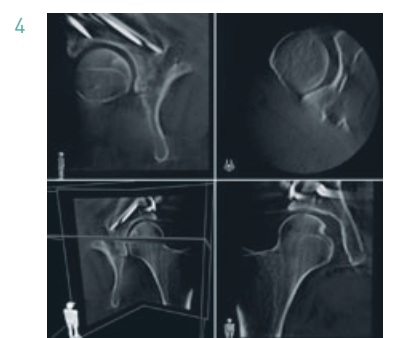
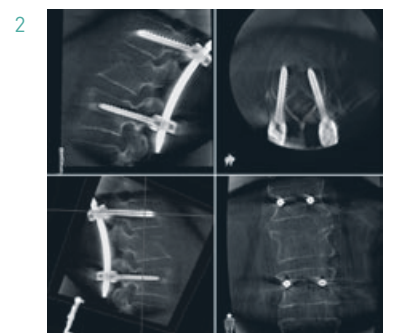
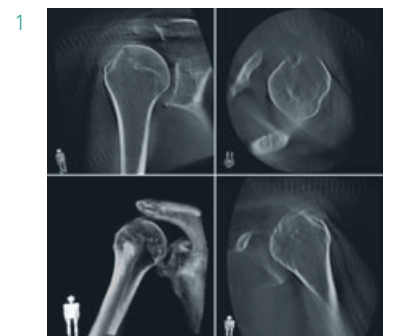
### → 3D reconstructions within seconds

In only one minute, the C-arm captures more than 100 images and automatically generates a 3D dataset. Dose exposure is reduced to a minimum during the scan due to a rotation of only 135° and predefined dose settings on the software side.





- 1 Image of a glenohumeral joint
- 2 Intraoperative check of pedicle screws in thoracic vertebrae
- 3 Image of carpus
- 4 Intraoperative alignment check during pelvic osteotomy



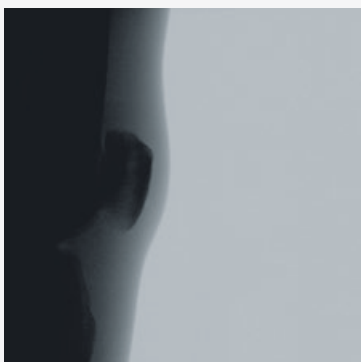
### → Isocentric cine loops for visualizing objects

A comprehensive range of viewing options including isocentric cine loops from 2D fluoroscopy images, volume views based on volume rendering as well as 3D slice views and multiplanar reconstruction (MPR) make the Ziehm Vision Vario 3D the surgeon's 'third eye'. The 3D volume with a resolution of  $512^3$  voxels enables even the tiniest anatomical structures to be visualized.

### → Automatic adjustment

Ziehm Vision Vario 3D is equipped with Object Detected Dose Control (ODDC). This function adapts all settings to the patient's anatomy. With 256 measurement cells, it automatically detects the object's position in the field of view and adjusts the system accordingly to always get a crystal-clear image – even if the object is not centered. ODDC also dynamically adjusts generator output and video levels to the patient's anatomy by detecting motion and any metallic devices located in the region of interest. Patients and OR staff benefit from fast, superb quality imaging and minimal dose levels.

#### ODDC Highlights



Conventional image quality

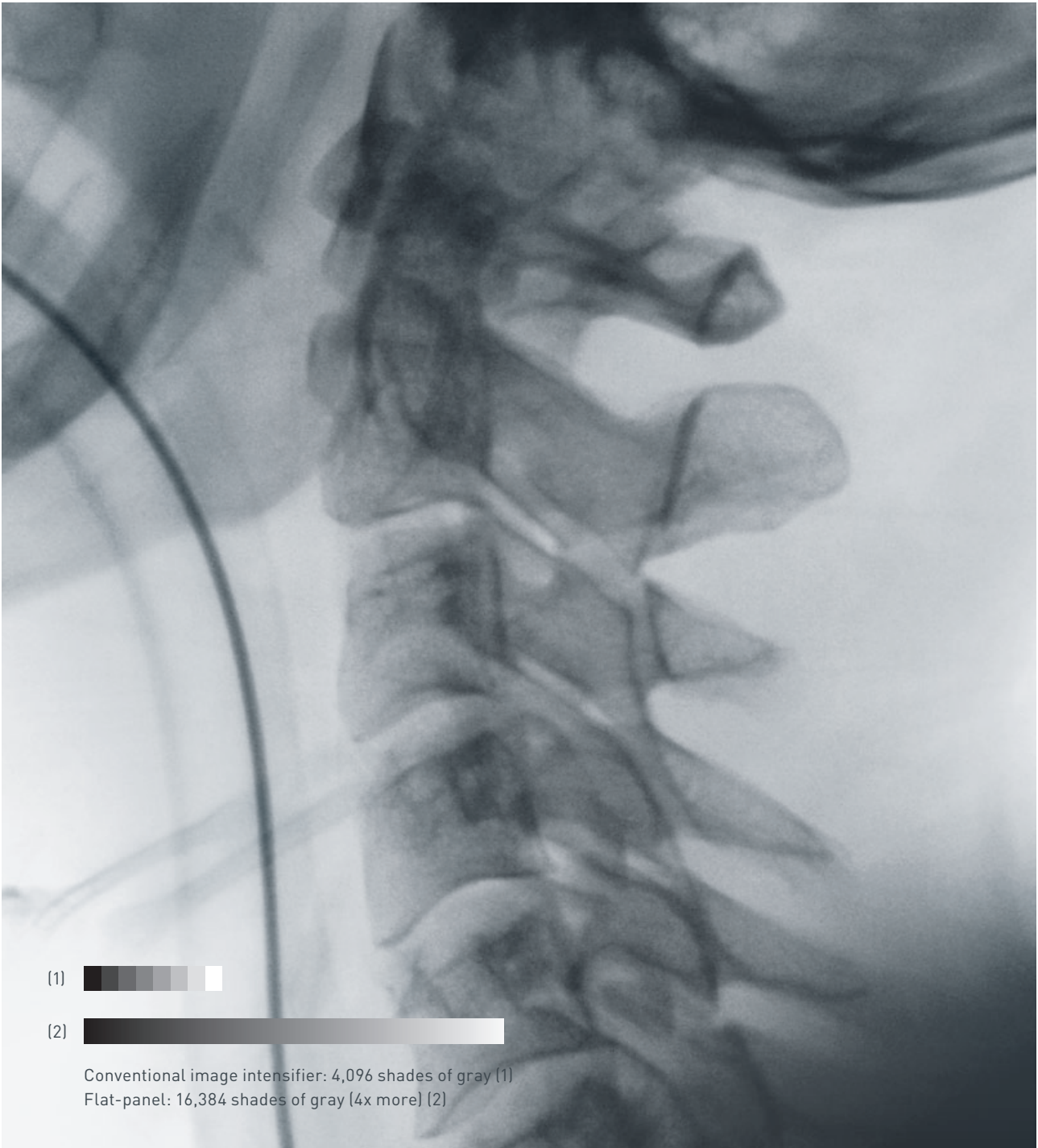


ODDC: Grid-controlled adjustment of dose levels, filters and pulse frequency



ODDC: Crystal-clear images achieved with minimal doses





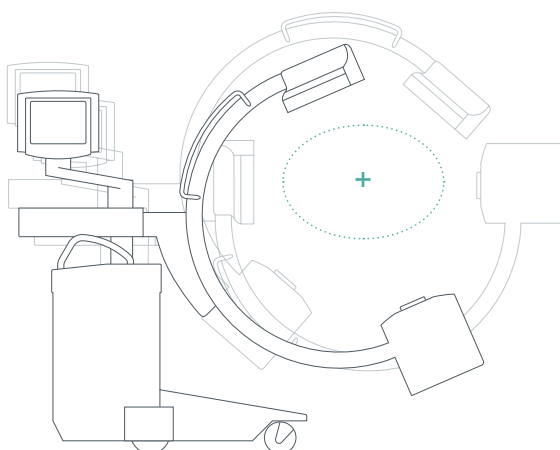
## 04 / New dimension in usability. Our C-arms support clinical workflows and set standards for intuitive guidance.

### → Best-in-class ergonomics

With a footprint of 0.8 m<sup>2</sup>, Ziehm Vision Vario 3D is one of the smallest 3D C-arms on the market. Its compact design and easy-drive system means it can be maneuvered with minimal effort during procedures. The steer and brake functions are activated via a single lever. All C-arm movements are fully counterbalanced in every position, making the unit extremely convenient to use. Furthermore, color-coded levers allow surgeons and staff to quickly and easily select the functions they need.

### → Intuitive workflow

The touchscreen user interface offers an intelligent workflow that makes operating the C-arm easy and intuitive. Users benefit from synchronized touchscreens on the monitor cart and the C-arm, as well as clear and easy-to-follow icons. The intuitive 3D workflow guides the user through all steps of the preparation and scanning process. Operators simply select the desired option from a list of anatomical programs, and the system automatically adjusts settings to the region of interest, always ensuring the best image quality and lowest dose.



The variable isocenter can be freely adjusted to different patient positions by operators, ensuring more flexible image capture and a wider range of applications, such as shoulder scans. Elliptical scanning further reduces dose levels by bringing the flat-panel or image intensifier closer to the patient's body.



### → Fit for the future

The graphical user interface and an open, modular software architecture ensure maximum flexibility. Ziehm Vision Vario 3D can be upgraded and expanded as needs change.

### → Prolonged use

C-arms need to be in continuous use during lengthy, demanding procedures such as multi-level interventions during spinal surgery. The unique liquid cooling system, Advanced Active Cooling (AAC), of the Ziehm Vision Vario 3D is more effective than cooling systems of conventional devices and keeps the generator at an ideal operating temperature. This guarantees uninterrupted usage even during long and difficult procedures.

### → Seamless integration

The open Ziehm NetPort interface enables easy integration into existing IT networks. Patient data saved in DICOM 3.0 format is transferred – via WLAN for example – to the PACS or HIS/RIS. Data can be retrieved from the monitor cart at any time. Data can also be backed up to DVD or USB and printed on transparencies or paper.





## 05 / Broadest application spectrum. Our units are engineered for the widest range of clinical applications.

Ziehm Vision Vario 3D's small footprint and variable isocenter make it ideal for 3D imaging during surgery. The fully automatic 3D scanning procedure saves time and helps to reduce radiological follow-up examinations. Combined with navigation systems, this C-arm is particularly suited to spinal, orthopedic as well as trauma, neuro and craniomaxillofacial surgery and brachytherapy.



Ziehm Vision FD Vario 3D



Ziehm Vision Vario 3D



Ziehm NaviPort



Stryker



Brainlab



Medtronic

Applications	Ziehm Vision FD Vario 3D	Ziehm Vision Vario 3D
Ortho/trauma	• • •	• • •
Spine	• • •	• • •
Vascular	•	•
Cardio	•	•
Interventional radiology	• • •	• •
Neurosurgery	• • •	• • •
Urology	•	•
Craniomaxillofacial surgery	• • •	• • •
Brachytherapy	• • •	• •
Features		
1k x 1k technology	•	•
Shades of gray	16,384	4,096
Distortion-free imaging	•	–
Fully digital imaging	•	–
Pulsed monoblock generator	•	•
ODDC	•	•
DICOM	optional	optional
WLAN	optional	optional
Active Cooling	•	•
C-arm opening	89.5 cm	76 cm
Field of view 9"/23 cm	–	363 cm <sup>2</sup>
Field of view 19.8 cm x 19.8 cm	392 cm <sup>2</sup>	–

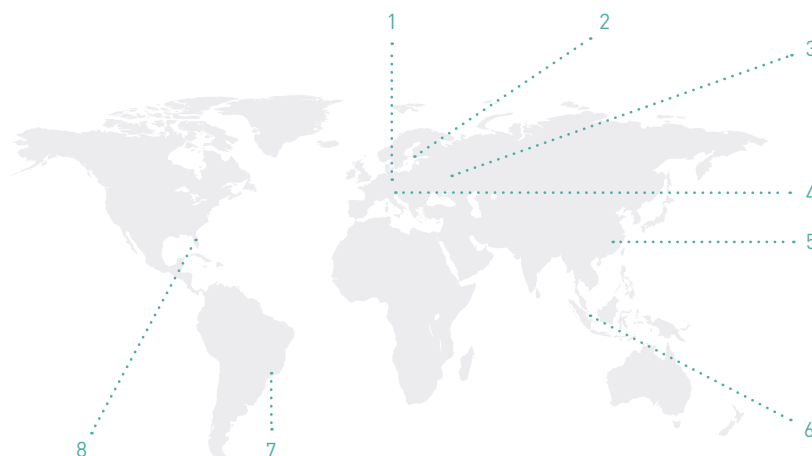
## 06 / Service. We make sure you get the best results from the best products.

### → Close to you

Regardless of your needs, our experts are on hand. Thanks to our worldwide network of service centers, you can always rely on Ziehm Imaging for flexible and fast service.

### → Keeping you at the cutting edge

With Ziehm Academy, you can enhance your clinical knowledge, find out more about mobile C-arms and receive made-to-measure training. The courses cover the full clinical spectrum, from general operator training and technical workshops through to high-level training sessions



#### Offices

- |                         |                         |
|-------------------------|-------------------------|
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| 2 Kerava (Finland)      | 6 Singapore (Singapore) |
| 3 Moscow (Russia)       | 7 São Paulo (Brazil)    |
| 4 Reggio Emilia (Italy) | 8 Orlando, FL (USA)     |



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