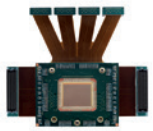
ARRISCOPE

True Augmented Microsurgery – See the Difference

MUNICH
SURGICAL IMAGING



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Oscar®-winning camera technology

The Super 35 digital camera integrated into the ARRISCOPE received in 2017 the “Technology Oscar®” – the Scientific and Engineering Award for Technical Innovation awarded by the Academy of Motion Picture Arts and Sciences.

ARRISCOPE – Fully digital 3D surgical microsope

Outstanding image quality

The sensor of the digital camera system is the heart of the ARRISCOPE. It has been used for many Oscar®-awarded films and it has even been honored by the Academy of Motion Picture Arts and Sciences with the coveted Technology Oscar. Thanks to our in-depth expertise in digital image processing, we at Munich Surgical Imaging, are able to master the entire image chain, together with custom-developed state-of-the-art LED illumination solutions to maximize performance.

Networking and connectivity

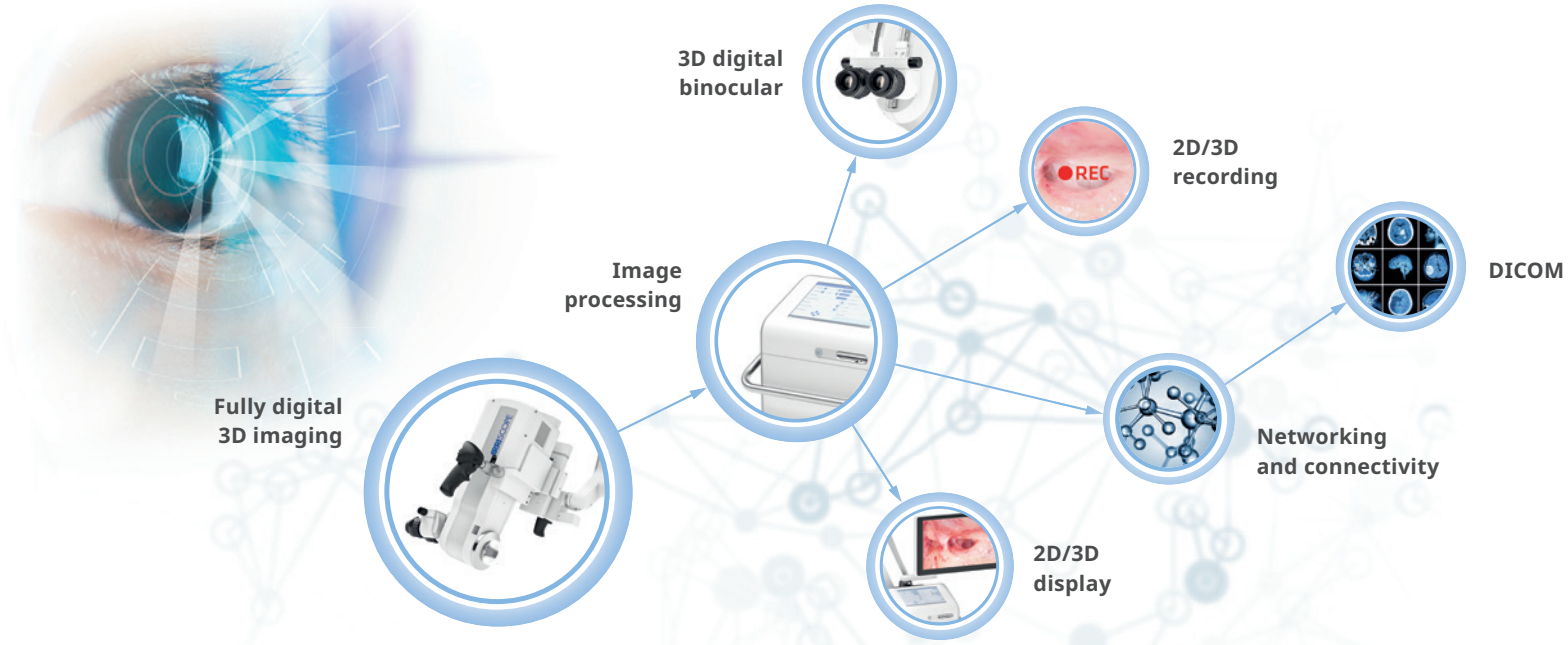
The ability to connect the ARRISCOPE to your hospital network and various display systems in the OR turns the ARRISCOPE into a central visualization system.

Fully digital 3D imaging

The digital 3D image chain of the ARRISCOPE delivers crystal-clear images in 4K. The system's high-resolution 3D digital binoculars make the ARRISCOPE a unique and truly digital surgical microscope.

Future-proof

We developed the ARRISCOPE to provide an upgradeable platform for the digital future of surgery. The system can be expanded to accommodate new applications, letting you benefit from technical advances in data acquisition and analysis.



Surgical cockpit – powered by high-resolution AR technology

See what really matters

The 3D digital binoculars are the core element that allow you visualize the key information directly in your surgical field of view.

Augmented reality

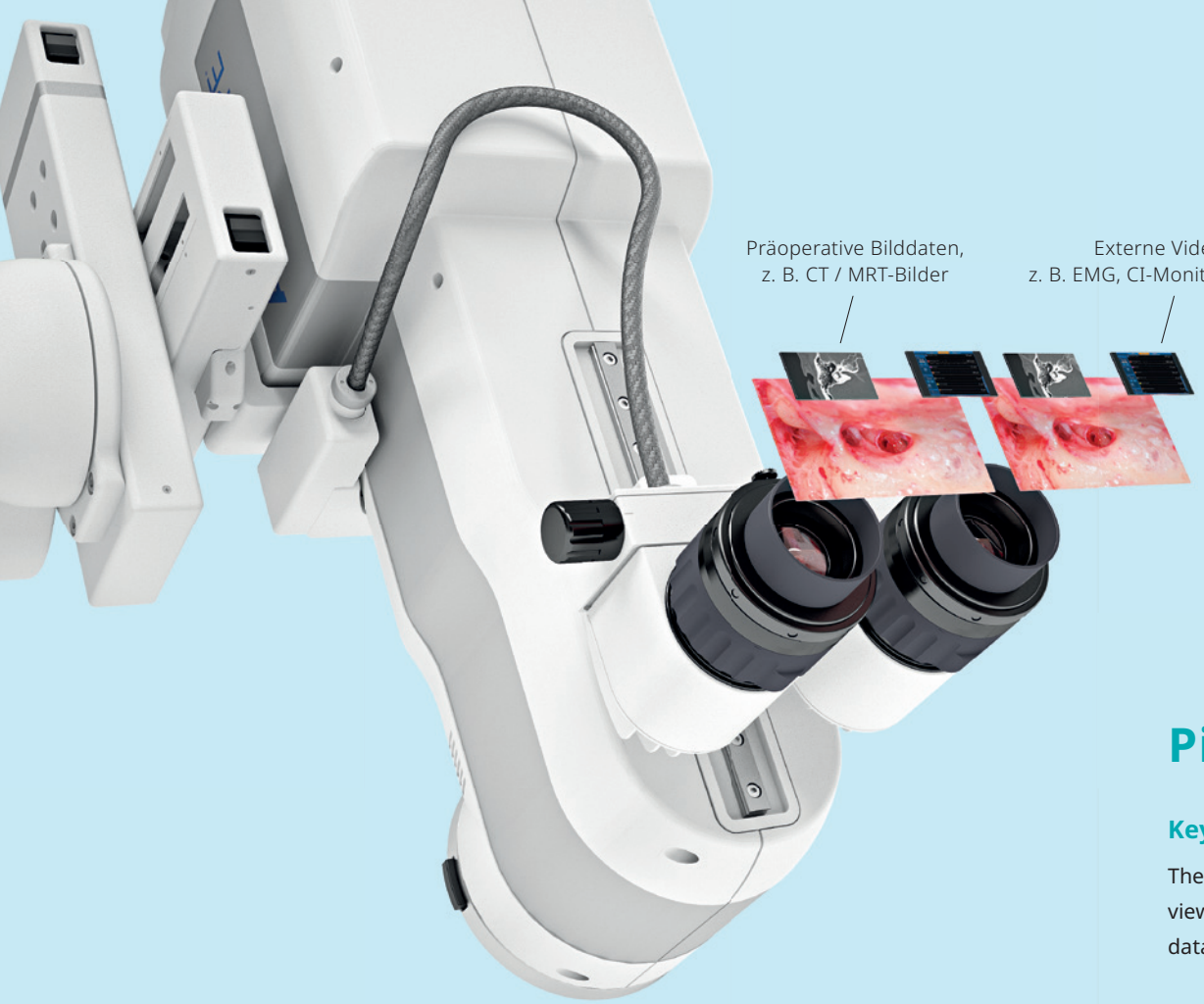
The digital displays enable visual augmentation in high-resolution quality. This means that in addition to the live image from the surgical site, all additional relevant information can be displayed in the highest quality.

Autonomous control

You, as a surgeon, can control the retrieval of information intuitively and directly from your working position through an on-screen menu, without the need for external support. This gives you even more control over the surgical intervention process.

Increased concentration

Thanks to the ARRISCOPE you have all relevant information on display and you do not have to turn your gaze away from the surgical field. With the ARRISCOPE you can immerse yourself completely in the operation, without distractions, while being able to call up exactly the information you require at any given moment.



Picture-in-Picture

Key information always on display

The Picture-in-Picture mode provides you with simultaneous viewing of the surgical field as well as preoperative images and data from other relevant sources.

“THE PICTURE-IN-PICTURE-DISPLAY ALLOWS ME TO KEEP AN EYE ON BOTH THE NEURONAL MONITORING AND THE SURGICAL SITE AT THE SAME TIME.THIS GIVES ME MORE CERTAINTY AND PEACE OF MIND.“

Prof. Prof. h.c. Dr. Thomas Lenarz,
Clinical Director Ear, Nose and Throat Clinic Hannover Medical School

Preoperative imaging directly on display

No interruption of the surgical procedure

Via the DICOM interface, preoperative data can be pulled onto the ARRISCOPE. You can quickly access and check the displayed CT and MRI images using the ARRISCOPE handles.

Wireless integration

With the integrated WLAN module, transmission is also possible wirelessly and can take place conveniently even during the operation.

“THE ADDITIONAL DISPLAY OF A 3D ENDOSOPIC IMAGE, WHICH IS INTEGRATED INTO THE 3D MICROSCOPE IMAGE TO EXAMINE AREAS THAT ARE DIFFICULT TO SEE WITH A SURGICAL MICROSCOPE, PROVIDES A FANTASTIC OVERVIEW.“

Prof. Dr. Stefan Plontke,
Clinical Director Universal Clinic and Polyclinic for Othorhinolaryngology,
Head and Neck Surgery Martin-Luther University Halle-Wittenberg

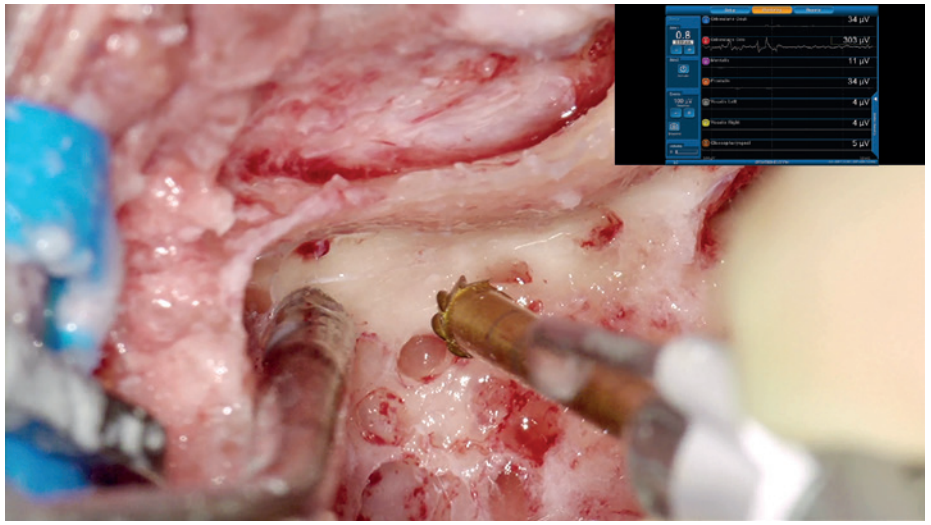
Video-in mode

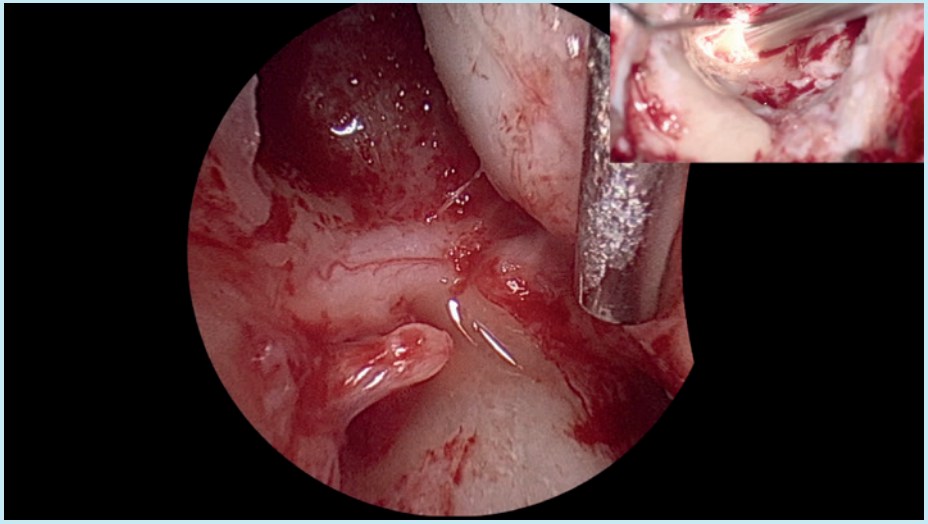
Central visualization system

You can connect external video sources, such as EMG devices, CI adjustment monitors, conventional laptops or macro-cameras to the ARRISCOPE and display their images in high resolution in the digital binoculars.

For example, the display of **intraoperative nerve monitoring systems** directly in the 3D binoculars can help identify nerve functions even faster, reducing the risk of nerve damage.

The **electrophysiological responses during the cochlear electrode insertion process** can also be visualized in real time for the surgeon in the 3D binocular because the surgeon receives direct feedback when important structures in the cochlea are touched.





Endoscope integration

To check areas that are difficult to see (e.g. cholesteatoma) using an additional endoscope, you can have the live image displayed directly in the 3D binocular and also as a picture-in-picture. This allows you to view the images from the microscope and the endoscope in the same setting, instead of having to constantly turn from the binocular to the monitor.

(3D)²

The coupling of a 3D endoscope is a special feature. In Picture-in-Picture mode, the 3D image can even be displayed simultaneously in the surgeon's view together with the 3D image of the ARRISCOPE.

“WITH ITS SIGNIFICANT DIDACTIC ADVANTAGES THE ASSIST MODE ALLOWS A COMPLETELY NEW FORM OF INTRAOPERATIVE TEACHING AND VISUAL SUPPORT.“

Prof. Dr. Robert Mlynski,
Clinical Director of the Ear, Nose & Throat and Head & Neck Surgery Clinic and
Polyclinic at the Otto Koerner Clinic, Rostock University Hospital

See with the surgeon’s eyes

Didactic advantage – Share your surgical experience directly

For observers, the video transmission with the ARRISCOPE is always as brilliant as the surgeon's view. The surgeon and any observers inside and outside the OR see exactly the same image in an outstanding 3D 4K image quality: with the same field of view, magnification and focus position.

Didactic Advantage

Commented operations for teaching and surgical education are particularly easy to follow and have been proven to enhance the learning experience. This also applies to video transmissions over long distance through the Internet, broadcast stream or using the in-house infrastructure to connect to a lecture hall.

Easy speech transmission and recording

Using a headset microphone, which easily connects to the ARRISCOPE via Bluetooth, the voice explanations of the operator can be added to the video track to be combined in the same output interface. You can create instructional videos with the highest image quality and synchronized voice recording virtually at the push of a button.

Assist Mode – A new benchmark in clinical education

Real-time support via touchscreen

Supporting another surgeon with useful information during an operation has never been as easy. The touchscreen user interface allows for viewing and graphical annotation onto the surgical field of view, for instance to mark crucial anatomical structures.

Synchronized surgeon’s view

All information becomes visible right in front of the surgeon’s eyes in the digital binocular. You remain focused on the procedure without the need to turn away from the binoculars.

Time saving

No need to scrub and dress in sterile attire, to be able to provide surgical support in situ.

Convenience in every detail

Slim design to reduce space requirements

The long-articulated arm and the wide rotation range of the ARRISCOPE affords you with great flexibility as to how you position the system in the operating room. This allows both the surgeon, and the OR staff have optimum patient access, making it ideal e.g. for bilateral ear operations.

Ease and precision in movement

The mechanical stand design allows the microscope to be positioned over the operating field with little effort and only one hand. Thanks to the solid mechanical and vibration-absorbing design of the stand, the ARRISCOPE delivers a stable image that always keeps the surgical focal point in clear view.

Ergonomic working position

The surgeon has the choice

The ARRISCOPE offers you the choice to operate through the 3D binoculars or by using the 3D HD monitor. In both cases, you can adopt an ergonomic working position, reducing the strain on your back and neck muscles.

Interactive working atmosphere enabled by heads-up surgery

Operating via a 3D monitor that can be freely positioned in the OR lets you work in an upright ergonomic posture throughout the entire operation. This operating position creates an interactive working atmosphere in the operating room (Team View Surgery).

Wireless transmission

With the ARRISCOPE wireless video transmission module, the 3D surgical image can be transmitted to up to four display devices simultaneously. The wireless video transmission also reduces the risk of tripping in the OR.

Highest concentration through the ErgoView 3D Binocular

The ErgoView 3D binoculars can be easily brought into nearly any comfortable working position, thanks to the fact that they do not need to be directly connected to the beam path of the microscope.

Eyeglass wearers can adjust their individual focus setting using the diopter adjustment device provided.
In comparison to heads-up surgery, the surgeon's view of the site is completely undisturbed, allowing for excellent concentration.

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Munich Surgical Imaging as a partner for innovative research

As the manufacturer of the ARRISCOPE, we cooperate closely with clinics and scientific institutions in research projects conceived to expand and prove the clinical benefits of the innovative ARRISCOPE technologies.

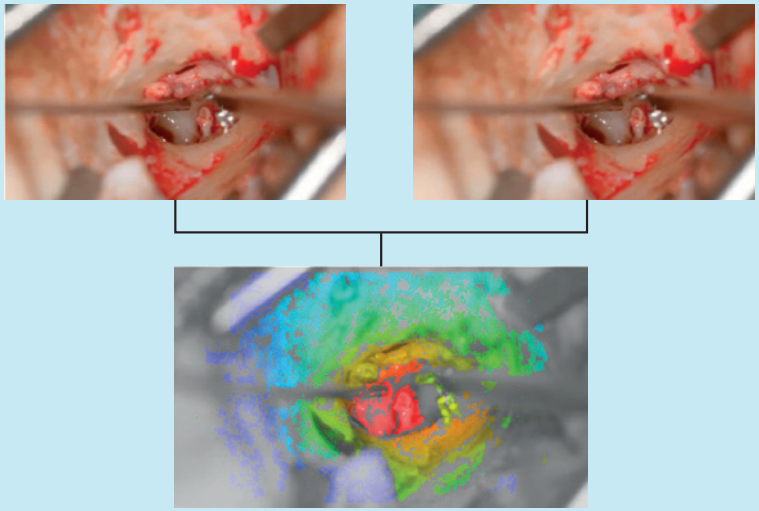
ARRISCOPE – A platform for clinical research

A multitude of research opportunities enabled by digital features

Our proprietary technology can manage data via a powerful image processing chain from the camera sensor to the digital binoculars, offering you a wide range of research opportunities.

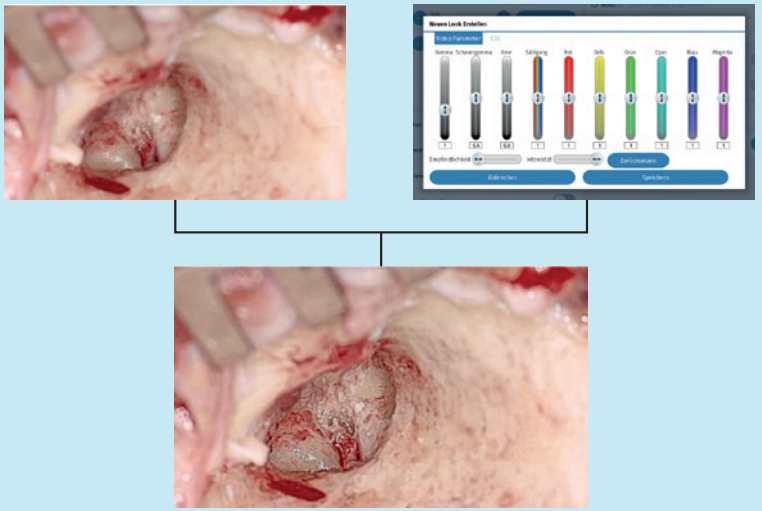
Dedicated research mode*

We have implemented a special research mode* in the ARRISCOPE to offer more possibilities to amplify the image signal or to enrich it with additional information. The better recognition of relevant structures leads to an optimization of the surgical workflow and to a noticeable simplification of the daily surgical routine.



Calculation of a depth map

Using two digital stereo images, a 3D depth map can be calculated. This allows you to measure the distance between two points of choice in the surgical view, regardless of the planes on which they are located.



Look Generator

The “Look Generator” that is integrated into the ARRISCOPE enables the operator to mark images in order to better differentiate certain tissues and structures by modifying the colors and contrast, instead of having to rely on contrast agents.

** The research mode is not covered by the CE mark of the ARRISCOPE. It is not intended or approved for clinical use.*

Munich Surgical Imaging – A partner you can trust

Our priority, at Munich Surgical Imaging, is to focus on the needs of our customers. This focus is clear when it comes to our technical innovations and in the field of surgical visualization. That said, we are as equally as convinced that high-quality technology deserves the highest quality of technical service.

The Munich Surgical Imaging Service Team always strives to maintain a flawless performance of the ARRISCOPE so that both the surgeon and the entire OR team can concentrate on what really matters – the patient.

Munich Surgical Imaging offers different service concepts tailored to the budgets and needs of the customers. The service offering ranges from basic maintenance to complete coverage of all service needs, including remote support.

	Basic Support	Preventive Support	Premium Support
Guaranteed Response time < 180 minutes (Phone/Mail)	●	●	●
Guaranteed Response time < 3 working days (on-site)	–	–	●
Maintenance incl. labor and expenses	–	●	●
Wear Parts	–	●	●
Repair incl. labor and expenses	–	–	●
Spare Parts	–	–	●
Safety Updates soft- & hardware	●	●	●
Performance Updates soft- & hardware	–	–	●
Additional application training	–	○	●
Event Support e.g. 3D surgery broadcast	○	○	○

● = standard
○ = optional
– = not available

Media Services –
Exclusive service to enhance your next presentation

Thanks to the latest digital technologies, it is becoming increasingly possible to take lectures and courses to a new level of sophistication, with impressive visual material and smart transmission techniques. This requires a high degree of knowhow, meticulous planning, and high-quality equipment. Munich Surgical Imaging is at your disposal as an expert partner with exclusive "Surgical Imaging" services.

Digital teaching – Surgical procedures through live stream

Direct and immersive observation of surgical procedures is essential for medical education. Doing so in the operating theater and under the confines of standard optical microscopes present challenges, such as space constraints, poor visualization, and/or elevated infection risks. Munich Surgical Imaging offers a better alternative: With the Live-Stream of the ARRISCOPE, the live image from the OR, including synchronized sound, can be streamed to a designated website or display devices. Course participants or students receive password-protected access and can interact directly with the surgeon.

Production and editing of professional medical films

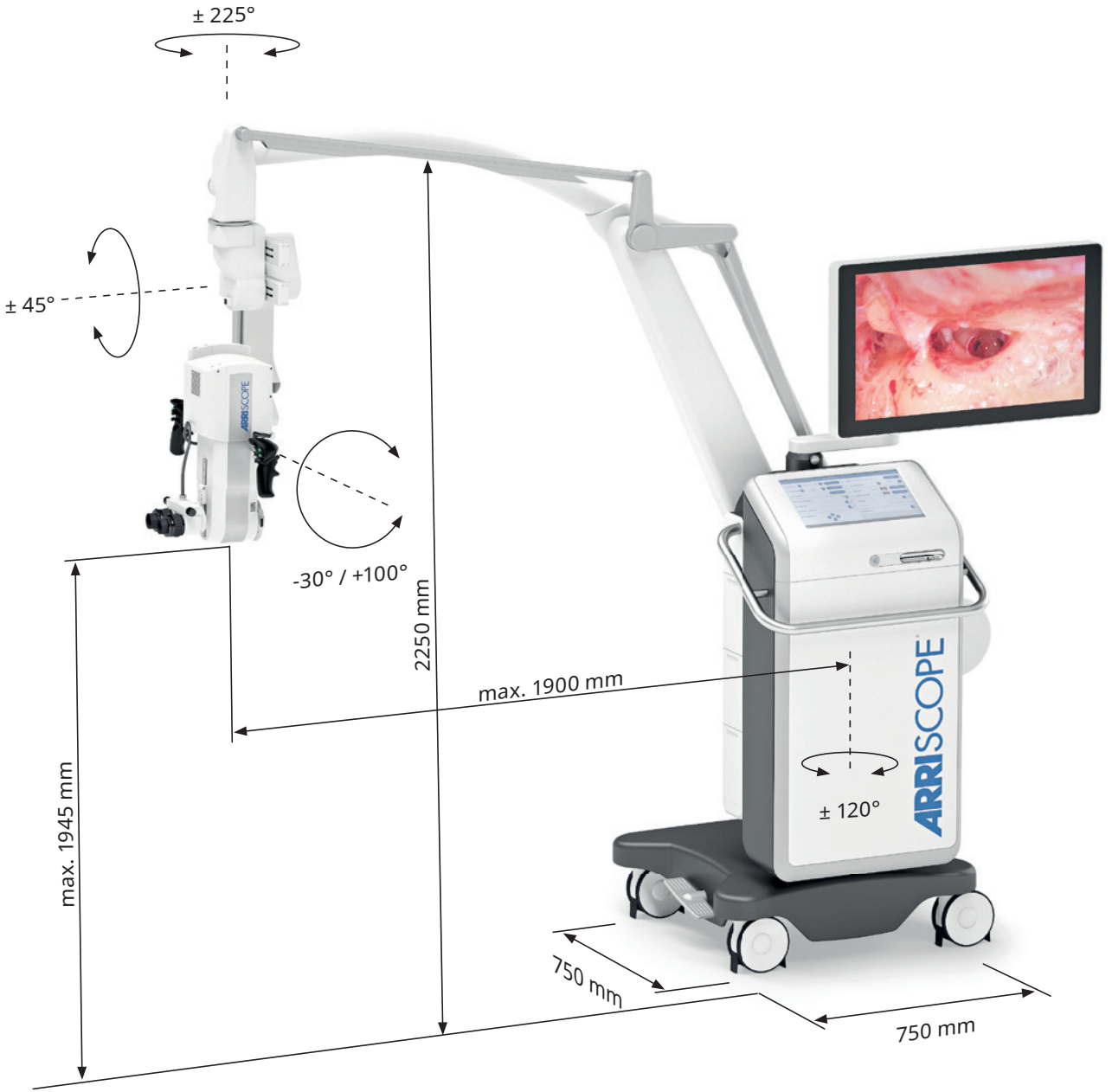
Inform, instruct and inspire your professional audience with surgical films produced by experts. Thanks to our legacy experience in the cinematography industry, Munich Surgical Imaging can provide you with professional audio-visual documentation of your work in the operating theatre to the highest standards. Our services include gathering of film footage produced in conjunction with the ARRISCOPE recordings, using professional video equipment and camera teams trained by OR staff. The digital image post-processing services, including targeted color adjustment, sound processing, subtitles, audio commentary and dubbing, can be done according to your preferences.

Conference technology for professional transmission of live surgical procedures

The transmission is available in large format, in both 2D and 3D, for congresses or conferences. Thanks to our high-quality equipment and years of experience, lecture participants will be immersed in your surgical procedure as though they were there in person.

ARRISCOPE – Technical data

Imaging system	Type	Native digital 3D imaging system	
	Display	Digital 3D binoculars (2 x OLED displays full HD: 1920x1080 pixel) Monitor with 4K Display (3D – 2 x Full HD right/left), capable for picture-in-picture	
	Image sensor	CMOS	
	Dynamic range	14+ f-stops	
	Frame rate	60 Hz	
Optics	Zoom	Optical	
	Zoom factor	6x	
	Working distances	210 mm; 250 mm; 300 mm; 430 mm with variable focus range	
Illumination	LED	Multispectral high performance LED (cold light source (without IR/UV))	
	Illumination channels	2 (second channel can be switched on/off on demand)	
Stand	Reach	1900 mm	
	Brakes	Electromagnetic brakes on all axes	
	Footprint	750 mm x 750 mm	
	Transport position (l x w x h)	1400 mm x 800 mm x 1900 mm	
	Total system weight	~ 320 kg	
Operation	User interface	Application-oriented graphic design on touchscreen incl. control of functions via graphic operating elements on the displays	
	Hand grips	Multifunctional	
Technical data	Power consumption	1200 W	
	Supply voltage	~ 220 V - 240 V	
	Maximum current consumption at 230 V	5 A	
	Supply frequency	50 Hz	
	Electrical standards / norms	EN 60601-1:2006: Cor.:2010 + A1:2013 Safety class I, IP20	
Environmental conditions for operation	Temperature	10°C – 30°C	
	Humidity	30% – 75%	non-condensing air humidity
	Air pressure	795 hPa – 1060 hPa	
Recording	Storage medium	USB 3.1 / CFAST 2.0	
	Recording formats	Video (2D, 3D): ProRes 4:2:2 HQ / H.264 (MPEG4)	Single Images (2D / 3D): TIFF, JPG, DPX
Video	Integrated monitor	4K 3D 31" (on adjustable monitor arm)	
	External monitor	4K 3D 31"; 4K 3D 55" (stand-alone or on monitor cart)	
	Video connections	HD-SDI video in / video out (1080p 30/60Hz, 2D / 3D), Wireless video transmission (Full HD, 2D / 3D)	HDMI via glass fiber cable (Full HD/4K, 2D/3D)
Audio	Bluetooth headset microphone	for voice recording and voice output via HDMI and HD-SDI	
Data management	DICOM	DICOM Worklist for mapping the patient list from the surgical planning system to the ARRISCOPE DICOM Viewer for displaying preoperative image data in the binoculars and on the monitors of the ARRISCOPE DICOM Query/Retrieve for retrieving and searching preoperative image data from the archive system Reading the DICOM data via network connection or integrated CD/DVD-reader	
	Network	Network-compatible via LAN connection or via optional WLAN option	
Accessories	Laser micromanipulator	Interface for Lumenis AcuSpot 712-Z and 712-L	



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Watch a brief overview
of the operations
in a 3D or 2D video!

2D/3D

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