

From Eye to Insight

Leica
MICROSYSTEMS



AUGMENT YOUR REALITY

Introducing the ARveo digital
augmented reality microscope



Advancing together

"Leica Microsystems works closely with neurosurgeons to bring new technologies to the market that really respond to our needs. GLOW AR technology is an exciting new approach which provides a totally new view during vascular neurosurgery. I believe GLOW will have a significant impact on surgical outcomes in the future."

Cleopatra Charalampaki, Professor of Neurosurgery, Cologne Medical Center, Germany.

A SINGLE VISION FOR THE FUTURE

The ARveo is our most advanced microscopy imaging solution to date. Designed for the most complex surgical interventions, it features sophisticated digital imaging technology, outstanding optics and the ability to capture and share surgery in 3D. What's more, only ARveo with GLOW AR technology provides a real-time augmented reality view of the surgical field, supporting you to assess and perform procedures with confidence.

Discover the game-changing features, world-class technology and innovative design upgrades that make up the ARveo digital augmented reality microscope.



It's time for empowered decision-making

GLOW AR technology & GLOW800 AR fluorescence.

Page 4-5



A decade of pioneering fluorescence

Choose your FL mode.

Page 6



Further augment your insight

IGS with robotics and endoscope compatibility.

Page 7



Choose your view, share your view

Visualization in the OR and beyond with HD 3D viewing and recording.

Page 8-9



Ingenious ergonomics make workflows flow

Comfort and maneuverability for you and your OR team.

Page 10-11



Impossible becomes possible

FusionOptics and innovative illumination.

Enhancing patient safety

Protection without interruption.

Page 12-13

IT'S TIME FOR EMPOWERED DECISION-MAKING

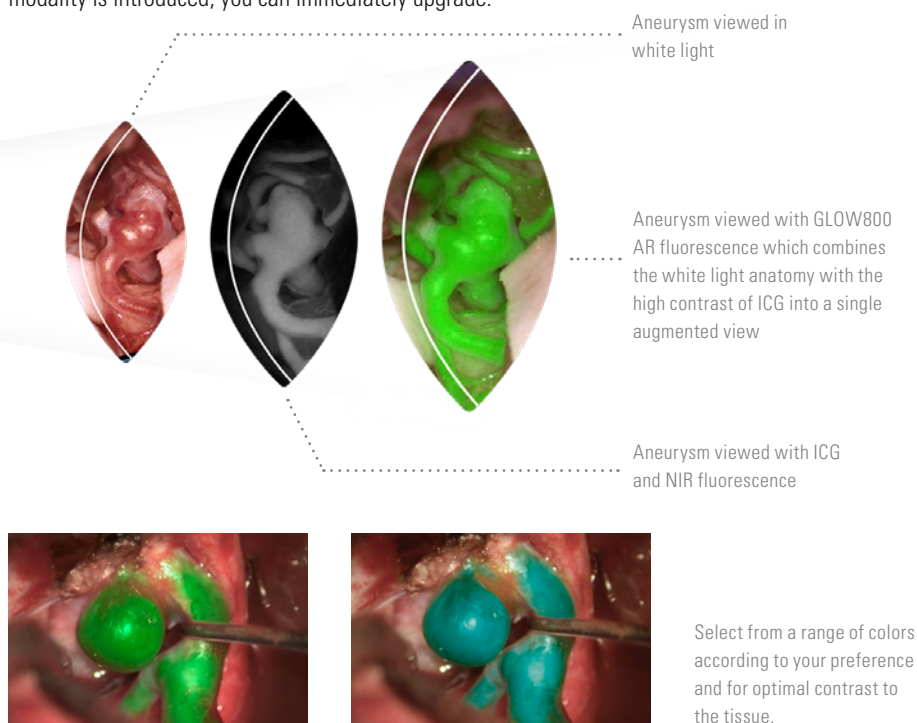
With a single, complete picture of what lies ahead, you can go forward with confidence.

The ARveo microscope platform integrates our proprietary GLOW AR technology. Building on a decade of leadership in fluorescence imaging, this new innovation is ready to revolutionize the way you navigate your most challenging neurosurgical procedures.

Assess. Establish. Advance with GLOW AR

Groundbreaking GLOW AR technology captures, optimizes and combines different sources of information such as multiple spectral bands of visible and fluorescent light. The result is a fully synchronized, real-time, augmented view of the surgical field.

What's more, the GLOW AR platform is future ready, so whenever a new GLOW imaging modality is introduced, you can immediately upgrade.

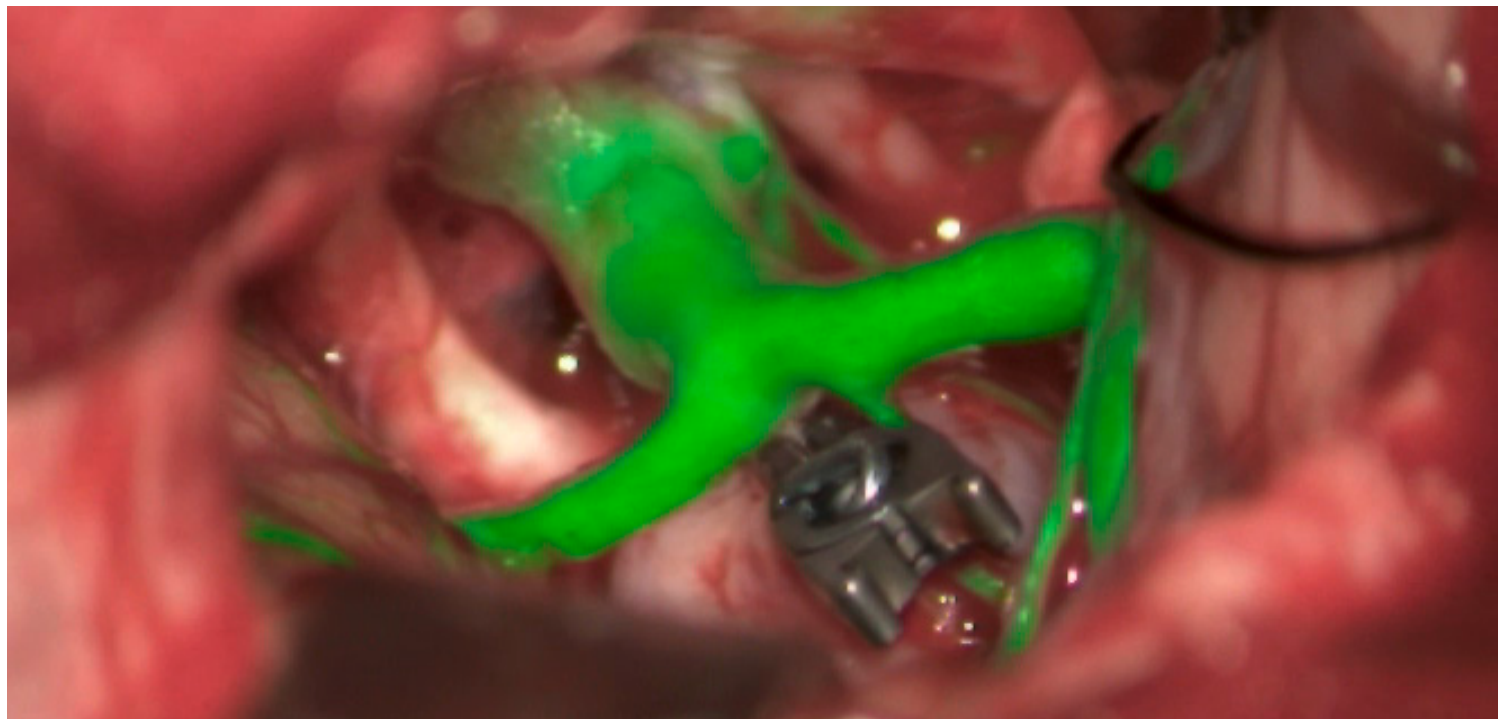


Right before your eyes

Observe GLOW AR fluorescence directly through the oculars with the CaptiView image injection module. And while you're focused on the task at hand, the whole team can follow in detail on the large 4K 3D monitor*.



*GLOW AR fluorescence modalities are not available in 3D



VASCULAR FLUORESCENCE. AUGMENTED

Observe cerebral anatomy in natural color, augmented by real-time vascular flow, with full depth perception, for confident interventions.

GLOW800 AR fluorescence harnesses the high contrast of ICG and integrates with the white light image to create a striking visual distinction between anatomy and blood flow. See the natural color of tissue anatomy, experience full depth perception, and get a real-time augmented view of vascular flow, for enhanced confidence to make precise treatment decisions.

One complete picture without interruption

- > No need to pause to watch a black & white NIR fluorescence video, no more mental gymnastics to recall and reconcile this with the natural anatomical view. Just activate GLOW800 and continue!
- > Depth perception without dark peripheries, through image homogenization, supports clear spatial orientation
- > Whether an AVM, aneurysm, bypass, or microvascular decompression, you always have the full view you need to confidently work in GLOW800 mode

GLOW800 supports your aneurysm clipping

Visualization with GLOW800 AR fluorescence supports each step of surgery. During aneurysm clipping, it helps you:

- > Assess clip placement and aneurysm occlusion
- > Check if all branches proximal and distal to the clipped aneurysm are perfused and whether there is orthograde filling of the blood vessels
- > Confirm the clip has not caused any compromise of surrounding blood vessels, such as kinking or partial obstruction

First impressions of GLOW800 AR fluorescence

"GLOW800 worked straight away. Suddenly we had the blood vessels lighting up but we could still see the brain structures around them. Now we can keep oriented in our surgical environment."

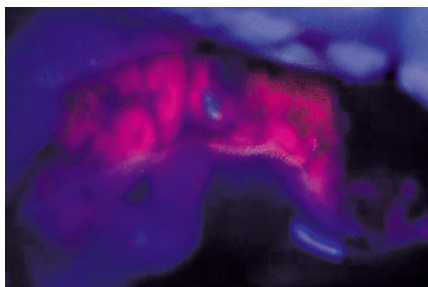
Professor Raphael Guzman MD, Professor of Neurosurgery, Vice Chairman of the Department of Neurosurgery, University Hospital and University Children's Hospital, Basel, Switzerland.

A DECADE OF PIONEERING FLUORESCENCE

At the forefront of innovation in fluorescence visualization for more than a decade.

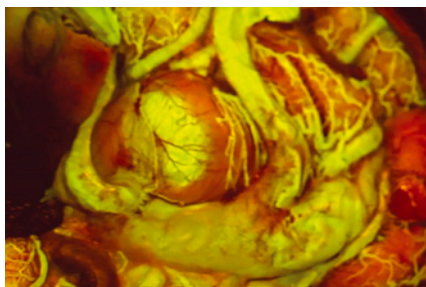
Pioneering fluorescence visualization

Leica Microsystems has been leading the way in fluorescence technology for the past 10 years and this dedication has enabled us to remain at the forefront of new developments. GLOW800 AR fluorescence plus additional fluorescence filters can be fully integrated into the ARveo. Switching between white light and fluorescence or between fluorescence modes needs just a few clicks.



FL400 oncological fluorescence

The fluorescence module FL400 is used during open neurosurgery in conjunction with the active substance 5 aminolevulinic acid (5-ALA). It supports resection by allowing differentiation of tumor tissue from healthy brain tissue.



FL560 fluorescence

FL560 allows observation of fluorophores with an excitation range between ~460 nm and ~500 nm. It allows you to view non-fluorescent tissue in natural color and simultaneously observe fluorescence in a bright yellowish-green color.



GLOW800AR fluorescence

Next generation GLOW800 augmented reality fluorescence takes the high contrast of NIR imaging with ICG and combines it with white light. The result is a single view of natural-colored anatomy augmented by real-time vascular flow.



FURTHER AUGMENT YOUR INSIGHT

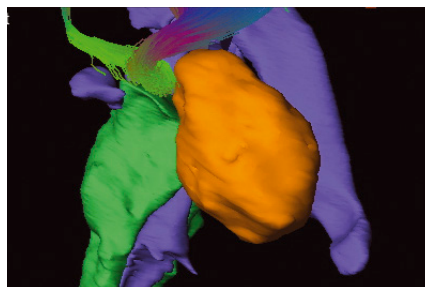
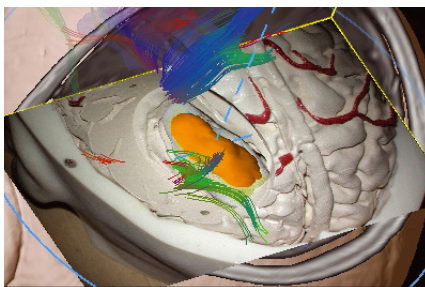
Visualization of eloquent
fiber tract information

Image shows Cranial Neuronavigation software from BrainLab

View images from IGS systems and endoscopes via oculars or 4K 3D screens and further augment your surgical insight.

Image Guided Surgery

Clearly see your two dimensional microscope image in relation to three dimensional brain structures. Rotate, and manipulate your live data at will using software from the leading Image Guided Surgery (IGS) systems.



Enjoy robotic control by integrating Brainlab Microscope Navigation software

Align and view with ease

Support your intraoperative assesment with flexible viewing and registration.

- > Update patient registration on-the-fly during surgery using the microscope image
- > View information more ergonomically with picture-in-picture navigation options
- > Get support when assessing critical areas due to visualization of planned structures as semi-transparent volumes combined with a virtual 360 degree target view

Navigation-controlled robotics

Robotic alignment of the microscope enables:

- > Setting of a position and angle, then with the touch of a button the microscope will automatically return to that position
- > Selection of a point of focus and the ARveo will move independently to remain focused on this point
- > Positional tracking of the microscope with visualization of optical axis and focal point

Endoscope imaging

For minimally invasive surgery, a neuroendoscope can aid visualization of hidden or difficult-to-access areas.



Extend your visual information

A neuroendoscope can supplement your ARveo microscope with close-up visualization and instrument access to hidden structures, without the need for additional opening or retraction. This is why we've made sure the ARveo can display and record the image feed from leading endoscopes such as Aesculap. Activate the additional display with just one touch of the microscope handle.

Image shows a compatible neuroendoscope courtesy of Aesculap

CHOOSE YOUR VIEW, SHARE YOUR VIEW

Get the best view for you and share your surgery with others.

Neurosurgical procedures require your complete focus, so we've put you at the core of our design. The ARveo microscope makes viewing, capturing and sharing footage of surgery effortless.



Right before your eyes

With CaptiView image injection there's no need to look away from the surgical site to the monitor during surgery.

- > View GLOW AR fluorescence, IGS data from leading manufacturers, microscope information, endoscope, and additional input streams thanks to the OpenArchitecture design
- > Rely on full-HD 1080p resolution and 500:1 contrast
- > Overlay data on the live surgical image or view as non-correlated in left, right or both oculars
- > Your assistant can share your view directly in their oculars



Look forward to a 3D future

Continue to work with the full depth perception and high resolution you require without needing to look through the oculars.

- > Visualize minute anatomical details on a much larger scale and with natural color differentiation on 31-inch or 55-inch 4K 3D monitor
- > Choose to work heads-up and achieve a comfortable upright posture by positioning the optics carrier and cart-mounted 3D monitor exactly where you need them, this limits physical strain on the spine which can have a compounding effect over years in the OR
- > Feel even more immersed in your surgical procedure thanks to the magnified view and uncompromised working position



Optional 55-inch monitor
or 31-inch 4K 3D monitor*
with cart for flexible
positioning



31-inch 4K 3D monitor*



Suddenly they all see in 3D

The ARveo empowers your decisions, but it can also help you strengthen the skills of your team.

- > Enhance your teaching program with everyone able to follow each surgery magnified on a large 4K 3D monitor
- > A shared 3D view supports workflow as your full OR team can follow your every delicate move and be ready for the next step, even in complex cases

Ready to capture and save

Customize your recording, editing and video replay with the fully compliant and secure HDMD Pro from Med X Change.

- > Record video and still images to USB or your hospital network via cable or Wifi
- > DICOM/PACS integration allows you to document cases and save with patient data
- > Easily edit your recordings for education and presentation

Go beyond the OR

With the integrated Med X Change HDMD Pro you can stream live video instantly to mobile or desktop devices for flexible viewing and education beyond the OR.

- > Share your skills live with students and peers
- > Remotely observe your residents as they prepare the surgical site, without leaning over their shoulders



INGENIOUS ERGONOMICS MAKE WORKFLOWS FLOW

Thoughtfully designed for your comfort and efficiency.

The ARveo digital augmented reality microscope has been expertly designed so that it easily adapts to your preferred style of working and body frame. With ergonomics and efficiency factored into every design decision, from software to switch, you can experience all the benefits of augmented reality-enhanced surgery, without interrupting workflow.

Positioned for your comfort

- > A range of binoculars with full 360°-rotation for main surgeon and assistant to accommodate different operating positions and body frames
- > The design of the optics carrier enables both main and opposite assistant to achieve a comfortable upright working posture
- > 600 mm working distance allows for easy maneuvering and passing of the long instruments often used in spine procedures
- > Limit potential strain of harsh movements thanks to the lightweight handling and extensive range of movement of the optics carrier



Integrated and under control

Created to enable you to work uninterrupted, the streamlined design of the ARveo microscope integrates digital AR technologies and recording systems. Control functions via handle, footswitch or new multi-directional mouthswitch.

Long overhead reach for flexible positioning in your OR

Superior overhead clearance

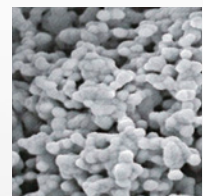


Made to withstand

The premium overhead stand from our partner Mitaka was designed and built for intensive, flexible and extremely reliable performance in the OR. Based on aerospace technology, it has a robust full-metal construction with long reach and a space-saving compact footprint.

Effortless operation via handgrip, mouthswitch or wireless footswitch

Compact footprint frees up OR space



Antimicrobial nano silver coating minimizes pathogens on the microscope



Achieve perfect balance

Single button AutoBalance saves valuable time. With two pushes of a button, the system fully balances all six axes. Simply push the AC/BC button located above the optics carrier to re-balance the microscope intraoperatively, even through a sterile drape.



One-touch drapage air removal

Prepare for surgery with speed and ease thanks to the integrated drapage air removal System. Drape your ARveo microscope with any surgical microscope drape, activate the system on the microscope arm with one touch, and start working.



Position and maneuver with ease

The ARveo has an extensive range of movement and tilt of the optics carrier. In combination with long overhead reach and fast stabilization, this allows for quick adjustment and adaptation to different surgery steps and procedures.

IMPOSSIBLE BECOMES POSSIBLE

Optical quality
is at the heart
of the ARveo
surgical
microscope.

FusionOptics Technology

1. Two separate optical paths
2. One path provides depth of field
3. The other path provides high resolution
4. The brain effortlessly merges the images into a single, optimal spatial view



Magnification multiplier for 40% boost



SpeedSpot for fast focusing

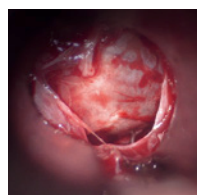


Fine focus for rear assistant

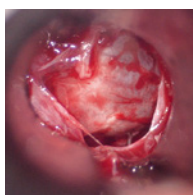
For too long surgeons had to compromise between high resolution and greater depth of field – no more! FusionOptics generates two separate beam paths that carry separate visual information. Your brain then effortlessly merges this into a single, optimal spatial image. The result? A more complete view of the surgical field thanks to a significantly expanded area in full focus. And whats more, less refocusing helps streamline your workflow.

Everything is illuminated

The more you know, the more empowered you become to make the right decisions for your patients. Small Angle Illumination (SAI) combined with bright 400 W Xenon illumination allows light to penetrate to the bottom of deep, narrow cavities.



Without SAI
(400 mm working
distance)



With SAI
(400 mm working
distance)

Visualization that adapts to you

- > The optional magnification multiplier boosts magnification by 40%
- > SpeedSpot uses two laser beams acting as a focusing reference to quickly provide a defined focus point for all viewing positions (surgeon, assistant, and camera)
- > The ARveo microscope features an independent fine focus for your rear assistant
- > A range of binoculars are available, all adjustable to different heights and positioning due to full 360°-rotation

ENHANCE YOUR PATIENTS' SAFETY

Safer light levels and reliable operation built in.

Equipment downtime and distracting stops and starts have no place in the modern operating room. The ARveo system has been designed to enhance safety while minimizing the risk of interruption.



Intuitive touch-screen



Bright light only where you need it



Keep working uninterrupted

Optimal, consistent light intensity

Be confident that you have maximum brightness while protecting patient tissue.

- > BrightCare Plus automatically adapts light intensity to the working distance, providing safer illumination (up to 60 % reduction)
- > An internal luxmeter provides real-time light data so light intensity can be measured from actual bulb output not via an algorithm or formula, adapting as the bulb ages
- > See more than ever before and still operate at safer light levels thanks to extremely efficient light transmission

Optimal field of illumination

Illuminate only what you need to see with intelligent, responsive light adjustment.

- > Autolris automatically adjusts the diaphragm in line with the zoom, so as the field of view decreases so does the field of illumination, ensuring that only the visible area is illuminated
- > As there is no peripheral illumination there is no potential that tissue outside the field of view could be burned

Stay operational

Continue your surgical intervention uninterrupted in the rare case of a technical problem.

- > Two 400-Watt xenon arc-lamp illumination systems with independent lamps and boards ensure that if a bulb fails, the second system can automatically activate
- > The microscope and the video recording system are fully independent, so in the rare case of a video system error, the microscope retains full functionality so surgery can continue uninterrupted

TECHNICAL SPECIFICATIONS

OPTICS AND ILLUMINATION

FusionOptics	For increased depth of field and high resolution for main surgeon
Magnification	6:1 zoom, motorized optional magnification multiplier
Objective / working distance	225–600 mm, motorized multifocal lens, continuously adjustable and manual adjustment option
Eyepieces	Wide-field eyepieces for persons wearing glasses
Observation	Full stereo view for main surgeon and opposite assistant, semi stereo view for 2 side assistants
Integrated 360° rotatable adapter	For main surgeon binocular and opposite assistant
SpeedSpot	Laser focusing aid for fast and exact positioning of the microscope
Illumination	- High-output 2x 400-W redundant xenon arc-lamp systems via fiber optics cable - Continuously variable illumination field diameter - Continuously adjustable brightness at constant color temperature - Automatic activation of 2nd illumination
Autolris	Built-in automatic zoom-synchronized illumination field diameter, with manual override and reset feature
BrightCare Plus	Safety function through working distance-dependent limitation of the brightness, controlled by built-in luxmeter

MANEUVERABILITY AND CONTROL

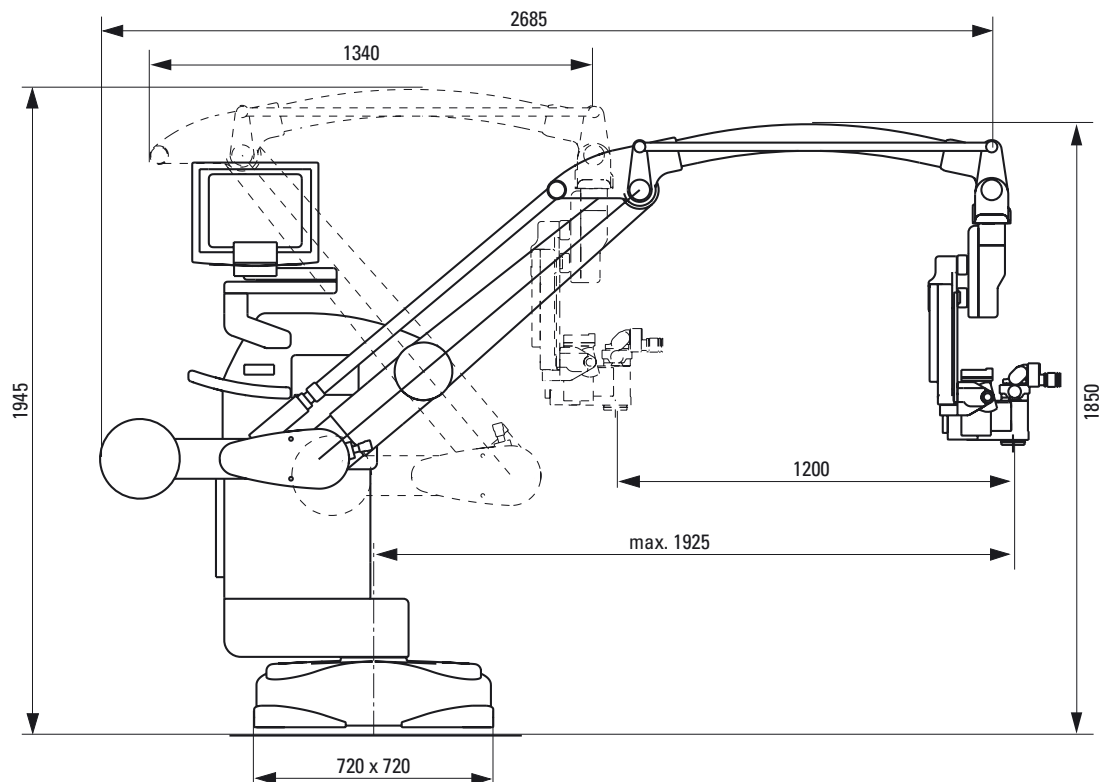
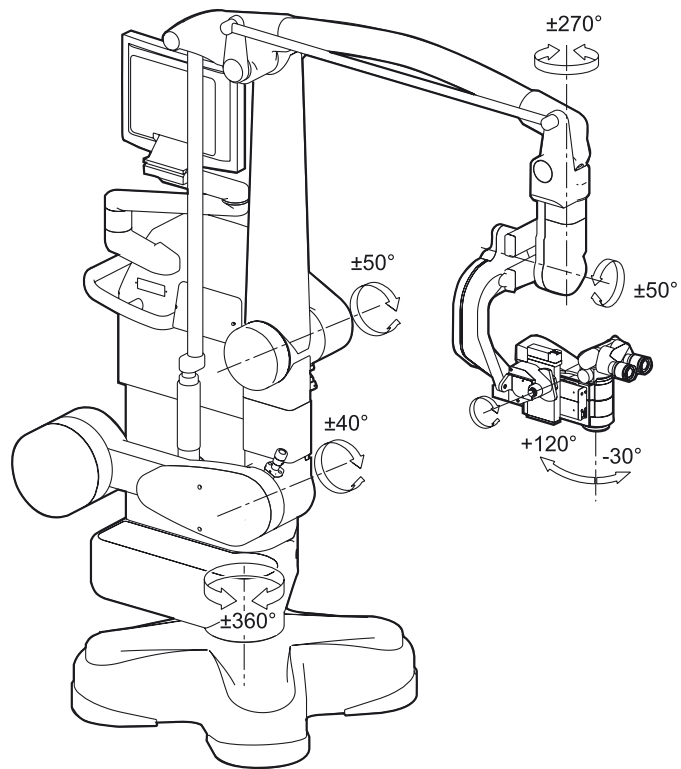
XY speed	Zoom linked XY speed
Robotic function	- Motorized XY movement - Externally controllable (optional)
Control	- Freely programmable handles
Balancing	- Automatic balancing of stand and optics - Automatic intraoperative balancing
Microscope carrier	"Advanced Movement" system for balancing six axes and vibration damping technology
Carrier for monitor	Flexible arm with 4 axis for rotation and inclination

MODULAR OPTIONS

GLOW800 augmented reality fluorescence	- Fluorescence excitation 790 nm - Fluorescence signal 835 nm - Image sensor 1x 1/1.2" - Dedicated high-sensitivity HD IR video camera
FL400 fluorescence	FL400 blue light fluorescence module
FL560 fluorescence	FL560 fluorescence module
CaptiView image injection	Full-HD image injection module
2D/3D video options	- 2D HD touch screen monitor - 4K 3D monitor on microscope - 4K 3D monitor on optional cart system with 31-inch or 55-inch monitor - Video fine focus - Integrated auto focus - 3 surgeon-controlled digital zoom levels
HDMD Pro system from Med X Change	- Fully integrated 2D and/or 3D recording and editing - DICOM/PACS integration - Wireless connectivity - Live video streaming to mobile or desktop devices - Patient data and modality worklist import
Universal drape air removal with SMARS	- One-button drape air removal system - Compatible with all surgical microscope drapes
Additional controls	- Mouthswitch with multi-directional movement - 12-function wireless footswitch
OpenArchitecture	- Easy integration of IGS, laser systems and other inputs (ask your Leica Microsystems representative) - Prepared for integration of video camera systems and digital recording systems

TECHNICAL DATA

Power connection	- 1200 VA 50/60 Hz - 100 V - 240 V (± 10%)
Protection class	- Class 1
Materials	- All solid metal construction coated with antimicrobial paint
Load	- Swing arm: Min. 6.7 kg, max. 12.2 kg from microscope dovetail ring interface - Monitor arm: max. 16kg
Weight	- Approx. 320 kg without load





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Class IIa GLOW800

Class I surgical microscope ARveo incl. accessories

Not all products or services are approved or offered in every market and approved labeling and instructions may vary between countries.
Please contact your local Leica representative for details.

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