

MÖLLER 20-1000

New Paradigm in Neurosurgery



Always in perfect balance

 **MÖLLER-WEDEL
INTERNATIONAL**

Tradition and Innovation

The Masterpiece

145 years of professional experience

1864	1966	1975	1991	1994	2003	2007
Foundation	Worldwide first ceiling-mounted OR microscope	Introduction of the worldwide first OR microscope with variable focus	Worldwide first computer-controlled OR microscope	World premiere of the first manual/motorized OR microscope	Microsurgical operating system MÖLLER 20-1000 with PermaBalance and SensoServo technology	Image management system MÖLLER MIOS (Microscope Image & Operation System)



Control panel for microscope, attachable left or right

Safety bar for comfortable maneuvering, protection, and mounting of auxiliary equipment

Counterweight to balance the stand within the protected area of the safety bar

Service flaps for quick exchange of lamp module, access to more functions

Welcome

to the world of Möller-Wedel's operating microscopes. For 145 years we have been pioneers in the development of high precision optical systems for medicine and science.

Our trendsetting developments originate from intensive international interchange of ideas with physicians. Their demands are the guide line for the design of our operating microscopes.

We guarantee high precision in the fields of optics, electronics, and mechanics through our experienced research and production teams who transform innovative ideas into our top class operating microscopes 'Made in Germany'.

Möller-Wedel stands for optical quality, mechanical precision, and innovative technology allowing the surgeon full concentration on the operation. Lasting quality and, last but not least, worldwide quick and competent support ensure a long lifetime of our operating microscopes.

2008

Introduction of **MÖLLER MEDIS**,
the external microscope display



Storage place with receptacles for standard accessories under a hinged transparent cover

Cable ducts easily accessible

Eyepiece head with 200° inclination angle

Adjustable ergonomic **SensoGrips** for microscope control

Right **SensoGrip** with additional programmable functions

Compact stand base without rotational stops. Carriage moves in all directions.

In the operating room there is always limited space. The system **MÖLLER 20-1000** solves this problem by means of various design features.

The filigreed components of the stainless steel arm system, the soft shapes and colors, and the covered cables, easy cleaning, and easy disinfection are essential features. The safety bar provides easy movement of the stand, protection against moving parts, and acts as a mounting rail for the imaging unit **MÖLLER MIOS** and the control panel.

PermaBalance

Fly-by-wire technology



SensoGrip



The microscope should support the user during his work and not put him under stress. The system **MÖLLER 20-1000** follows the 'fly-by-wire' technology, which enables the user to control the complex system with only minimal force. With the support of the programmable **SensoGrip**, the microscope can easily be positioned, even when draped. Möller's new **SensoServo** drive provides precise and quick reaction.

During operation, the assistant may reposition the observer tube without affecting the balance.

The brakes and the motor-driven controls are activated via either **SensoGrip**. While the characteristics of motion are individually set on the control panel, mechanical positioning is performed on the **SensoGrip**.

The optical properties comply with the highest standards. The apochromatic optics with the correction of residual aberration provides perfect color fidelity, strong contrast, and high resolution. An exceptional depth perception is achieved due to the unique stereo base of 25 mm, enhanced by an iris diaphragm for increased depth of field. The variable objective lens permits working distances from 224 to 510 mm (nominal) without lens exchange. Other distance ranges are available.

Light and Imaging

The base of the floor stand houses a powerful 300 W xenon light source. According to your request, the base also contains a back-up lamp module for quick exchange or a second independent 300 W xenon light source.

The light is filtered against ultraviolet and infrared radiation to protect the surgeon's eyes and the patient's tissue. The light intensity can be controlled via hand grip or foot switch. Diaphragms in the microscope head may be selected during the operation to avoid glare.



Xenon lamp module

For ALA and/or ICG fluorescence special light sources are used. They contain filters which automatically snap in, when the fluorescence mode is selected on the hand grip, as do the observation filters in the microscope head.

A special light guide retains all important light constituents from the light source to the microscope head.

The arrangement of the heavy light sources in the floor stand base provides a low center of gravity thus allowing the system to be slim and unobtrusive in the operating room. The wire connections are also close to the functional parts in the base, easily accessible but well protected behind a cover.

MÖLLER MIOS

MIOS stands for **M**icroscope **I**maging and **O**peration **S**ystem. Its prime functions are recording of operation scenes, capturing and recording of snapshots together with proper identification of patients and hospital data. Images and/or streams can be stored on DVD-R/-RW, HDD, USB sticks, external USB hard disks, or transmitted to the hospital PACS system via DICOM.



MÖLLER MIOS



MÖLLER MEDIS

MÖLLER MEDIS

MÖLLER MEDIS (**M**icroscope **E**xternal **D**isplay) turns the operating microscope into a microsurgical image control center. The high-resolution screen, mounted above the oculars, provides images or data for the surgeon which he may see by momentarily looking up from the oculars. The touch screen allows to control numerous functions sterily through the drape. Three versions are available:

MÖLLER MEDIS M

Control of video recording, snapshots, ICG angiography observation

MÖLLER MEDIS E

As MÖLLER MEDIS M plus connection of endoscopic cameras via video converter

MÖLLER MEDIS I

As MÖLLER MEDIS E plus access to various data sources via IP addresses

Accessories



Video module
Optimal light efficiency and low height



Light router LR 1000
Face-to-face observation plus lateral ports



Light router LR 1000i
High resolution image injection



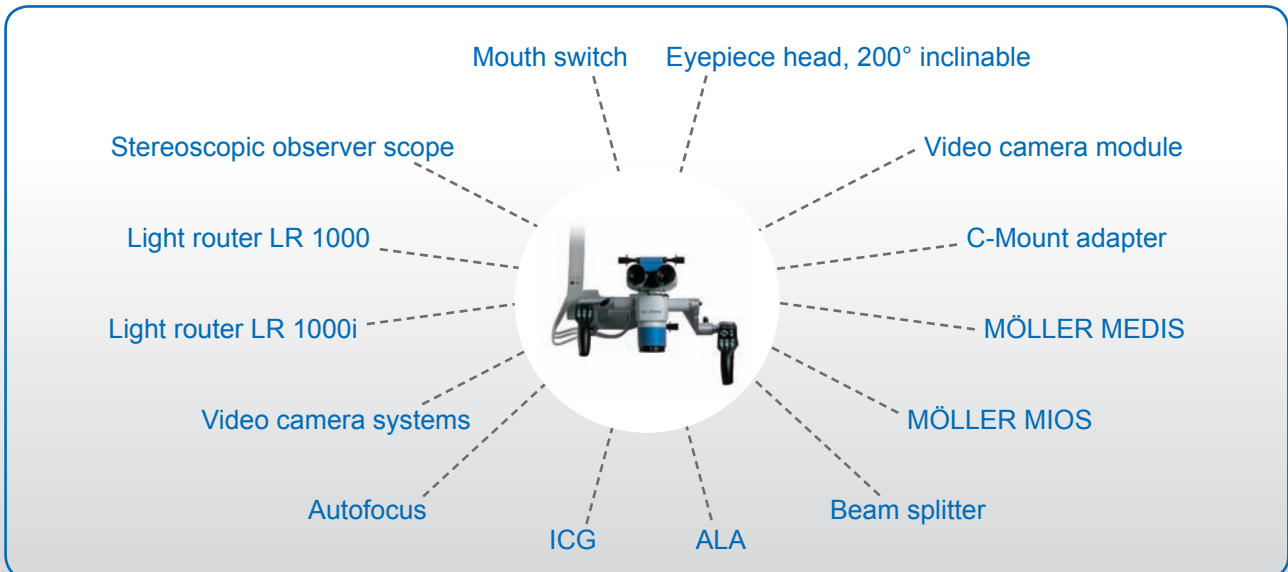
Lateral observer scope
With inclinable eyepiece, 3 axes, and image rotation for the assistant's optimal comfort



Foot switch EF 4000

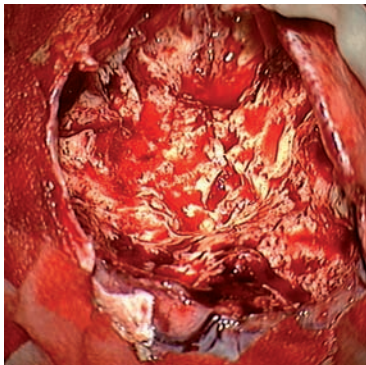


Mouth switch
Allows hands-free movement of the microscope in three axes

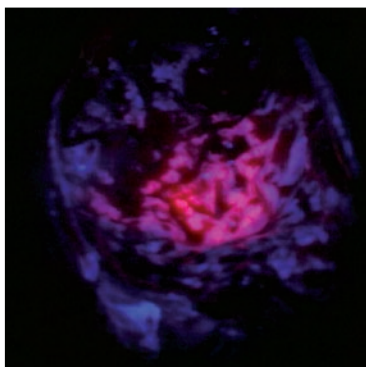


ALA Fluorescence

Intraoperative tumor fluorescence



Glioblastoma in white light



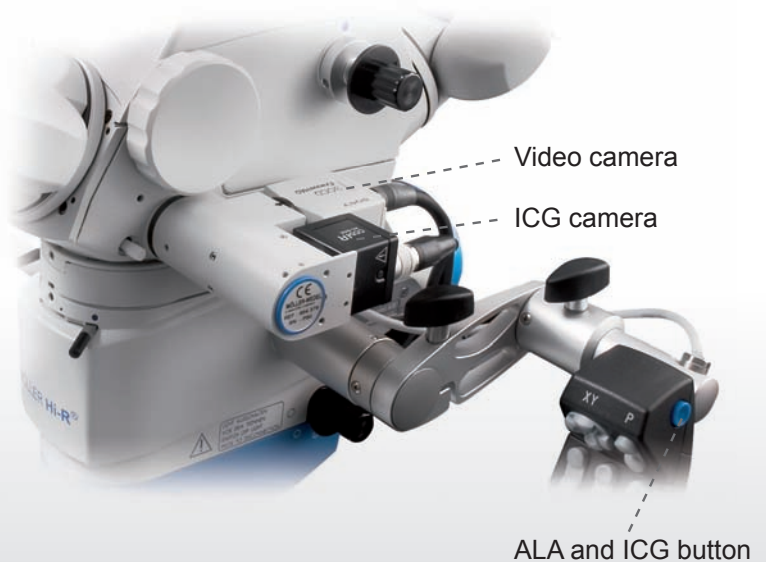
Blue light fluorescence with ALA

ALA

5-aminolevulinic acid, abbreviated ALA, is a natural amino acid which the human body metabolizes to heme, the red blood dye.

ALA is used in neurosurgery to mark the border lines of glioblastomas, degree III and IV, as well as the infected areas adjacent to the tumor. This is possible because such tumor cells inhibit the last step of the heme synthesis, which leads to an accumulation of the heme precursor protoporphyrin IX (PPIX) in the tumor cells. When illuminated with blue light, the PPIX emits a rich red fluorescence and marks the tumor core with intensive red and the infected areas with salmon-colored light.

Möller-Wedel produces operating microscopes with switchable filters for illumination (blue) and observation (yellow) of the operating field. The surgeon may switch between the normal white light and the fluorescence mode. Last, but not least: In the fluorescence mode the healthy tissue is sufficiently well visible for safe surgery.



ICG Fluorescence

Intraoperative fluorescence angiography

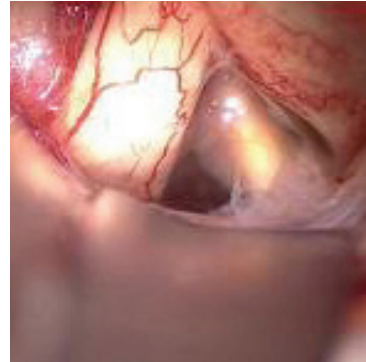
ICG

Indocyanine green, abbreviated ICG, is a medical dye which emits infrared fluorescence when illuminated with visible light.

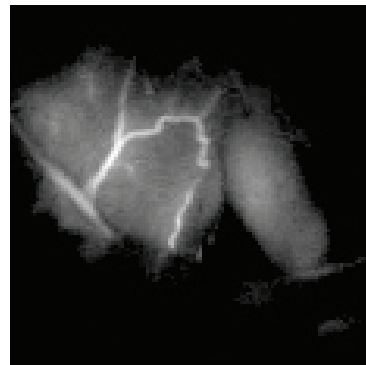
Besides its well established application in ophthalmology, ICG is now also used for intraoperative angiography, particularly in neurosurgery for detection of stenoses, leakages, and aneurisms.

Möller-Wedel produces OR microscopes which include, in addition to the white light camera, a special infrared camera with a filter for detection of the ICG fluorescence.

Following the injection of the ICG solution in the blood stream of the patient, the vessels become visible to the camera when the ICG flows by. Now, all irregularities of the vessels can be seen on MÖLLER MEDIS and MÖLLER MIOS displays.



Before ICG injection



After ICG injection



ICG light source

ALA light source

Technical Data

Microscope MÖLLER Hi-R 1000

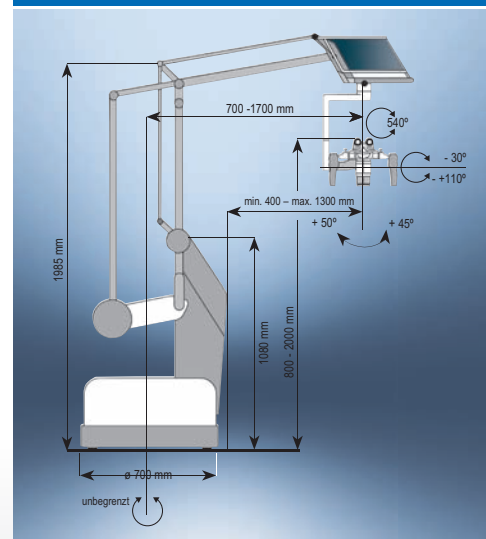
Optics	apochromatic
Working distance	lens 1: 224 to 510 mm (nom.), lens 2: 200 to 450 mm (nom.)
Magnification (work.dist. 250 mm)	2.2x to 13.3x
Diameter visual field (work.dist. 250 mm)	94.4 to 15.8 mm
Eyepiece head	200° inclinable, 10x wide angle oculars
Stereo base	25 mm
Weight (without accessories)	12 kg
Autofocus	optional
Video cameras	optional (special camera for ICG)
Image injection	optional (light router LR 1000i)
Equipment for fluorescence	optional (special filters)
MÖLLER MEDIS	optional (mandatory in ICG mode)

Floor stand FS 4-20

Height	1985 mm
Arm extension	700 to 1700 mm
Carrying capacity	13.7 to 18.7 kg (ICG: 13.7 to 20 kg)
Light source	300 Watt xenon* with back-up module
2nd light source (optional)	300 Watt xenon*
Weight	219 kg (ICG: 230 kg)
Height at the oculars	800 to 2000 mm
Power consumption	1000 VA (ICG: 1500 VA)
Operating voltages	100 to 240 VAC, selectable
Interface	RS 232, bidirectional
IGS connection	RS 232
Foot switch	12 functions, optional
MÖLLER MIOS	optional (mandatory in ICG mode)

*Special 300 W xenon light sources for ALA and ICG

Floor stand FS 4-20



Zoom ranges lens 1

Working distance mm	Magnification
224	2.5 to 15.0x
300	2.0 to 11.8x
400	1.6 to 9.7x
500	1.4 to 8.2x
510	1.3 to 8.1x

The magnification is indicated on the control display

Zoom ranges lens 2

Working distance mm	Magnification
200	2.5 to 15.2x
250	2.2 to 13.3x
300	2.0 to 11.8x
400	1.6 to 9.7x
450	1.5 to 8.9x

Subject to alternation

Tradition and Innovation - Worldwide



Responsibility for human beings and the environment



Your partner

HAAG-STREIT Group

HAAG-STREIT, founded 1858 in Switzerland, with its headquarters in Bern, has a top position internationally in the industry of medical products, particularly for ophthalmology. The group of companies, characterized by the motto 'Tradition and Innovation', consists of economically and technologically strong partners. MÖLLER-WEDEL is proud to be part of this group, which gives a strong foundation for the future development of operating microscopes.

MÖLLER products are available in most countries through dedicated distributors who also provide competent service and support. You will find the contact address of the local MÖLLER-WEDEL representative under www.moeller-wedel.com

- HAAG-STREIT companies
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Tradition and Innovation

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