

From Eye to Insight



MEDICAL DIVISION

PROVIDO

User Manual

10732418 - Version 05



Thank you for purchasing a Leica surgical microscope, PROVIDO.
In developing our systems, we have placed great emphasis on simple, self-explanatory operation. Nevertheless, we suggest studying this user manual in detail in order to utilize all the benefits of your new surgical microscope. For valuable information about Leica Microsystems products and services, and the address of your nearest Leica representative, please visit our website:

www.leica-microsystems.com

Thank you for choosing our products. We hope that you will enjoy the quality and performance of your Leica Microsystems surgical microscope.



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Legal disclaimer

All specifications are subject to change without notice.
The information provided by this manual is directly related to the operation of the equipment. Medical decision remains the responsibility of the clinician. Leica Microsystems has made every effort to provide a complete and clear user manual highlighting the key areas of product use. Should additional information regarding the use of the product be required, please contact your local Leica representative.

You should never use a medical product of Leica Microsystems without the full understanding of the use and the performance of the product.

Liability

For our liability, please see our standard sales terms and conditions. Nothing in this disclaimer will limit any of our liabilities in any way that is not permitted under applicable law, or exclude any of our liabilities that may not be excluded under applicable law.

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1 Introduction

1.1 About this user manual

In this user manual the surgical microscopes PROVIDO is described.



In addition to notes on the use of the instruments this user manual gives important safety information (see chapter "Safety notes").



► Read this user manual carefully before operating the product.

1.2 Symbols in this user manual

The symbols used in this user manual have the following meaning:

Symbol	Warning word	Meaning
	Warning	Indicates a potentially hazardous situation or improper use that could result in serious personal injuries or death.
	Caution	Indicates a potentially hazardous situation or improper use which, if not avoided, may result in minor or moderate injury.
	Note	Indicates a potentially hazardous situation or improper use which, if not avoided, may result in appreciable material, financial and environmental damage
		Information about use that helps the user to employ the product in a technically correct and efficient way.
		Action required; this symbol indicates that you need to perform a specific action or series of actions.

Technical documentation and Assembly instruction

The Technical documentation is part of the document "Assembly instruction".

1.3 Optional product features

Different product features and accessories are optionally available. The availability varies from country to country and is subject to local regulatory requirements. Please contact your local representative for availability.

2 Product identification

The model and serial numbers of your product are located on the identification label at the bottom of the horizontal arm.

► Enter this data in your user manual and always refer to it when you contact us or the service workshop regarding any questions you may have.

Type	Serial no.
...	...

3 Safety notes

The PROVIDO surgical microscope is state-of-the-art technology. Nevertheless, hazards can arise during operation.

- ▶ Always follow the instructions in this user manual, and in particular the safety notes.

3.1 Intended use

- The PROVIDO surgical microscope is an optical instrument for improving the visibility of objects through magnification and illumination. It can be applied for observation and documentation and for medical treatment.
- The PROVIDO surgical microscope is subject to special precautionary measures for electromagnetic compatibility.
- Portable and mobile as well as stationary RF communications equipment can have a negative effect on the reliability of the PROVIDO surgical microscope's functionality.
- The PROVIDO is intended for professional use only.

3.2 Indication for use

- The PROVIDO surgical microscope is primarily used for Neurosurgery/ Ear Nose and Throat surgery (ENT)/Spine Surgery/Dental surgery and PRS surgery in hospitals, clinics or other human medical institutions.
- The PROVIDO surgical microscope may be used only in closed rooms and must be placed on a solid floor.
- These Instructions for Use are intended for professional physicians, nurses and other medical and technical staff who prepare, operate or maintain the device. It is the duty of the device owner/operator to train and brief all the operating personnel.



WARNING

Danger of injury to the eyes.

- ▶ Do not use the PROVIDO in ophthalmology.

3.3 Contraindications

Do not use the PROVIDO in Ophthalmology.

3.4 Directions for the person responsible for the instrument

- ▶ Ensure that the PROVIDO surgical microscope is used only by persons qualified to do so.
- ▶ Ensure that this user manual is always available at the place where the PROVIDO surgical microscope is in use.

- ▶ Carry out regular inspections to make certain that the authorized users are adhering to safety requirements.
 - ▶ When instructing new users, do so thoroughly and explain the meanings of the warning signs and messages.
 - ▶ Allocate responsibilities for commissioning, operation and maintenance. Monitor compliance with this.
 - ▶ Only use the PROVIDO surgical microscope if it is free of defects.
 - ▶ Inform your Leica representative or Leica Microsystems (Schweiz) AG, Medical Division, 9435 Heerbrugg, Switzerland, immediately about any product defect that could potentially cause injury or harm.
 - ▶ If you use accessories from other manufacturers with the PROVIDO surgical microscope, make sure that these manufacturers confirm that the combination is safe to use. Follow the instructions in the user manual for those accessories.
- Modifications to or service on the PROVIDO surgical microscope may be carried out only by technicians who are explicitly authorized by Leica to do so.
 - Only original Leica replacement parts may be used in servicing the product.
 - After service work or technical modifications, the device must be readjusted in accordance with our technical specifications.
 - If the instrument is modified or serviced by unauthorized persons, is improperly maintained (as long as maintenance was not carried out by us), or is handled improperly, Leica Microsystems will not accept any liability.
 - The effect of the surgical microscope on other instruments has been tested as specified in EN 60601-1-2. The system passed the emission and immunity test. Comply with the usual precautionary and safety measures relating to electromagnetic and other forms of radiation
 - The electric installation in the building must conform to the national standard, e.g., current-operated ground leakage protection (fault-current protection) is suggested.
 - Like any other instrument in the operating theater, this system may fail. Leica Microsystems (Schweiz) AG therefore recommends that a backup system be kept available during the operation.
 - Only the supplied power cord may be used.
 - The power cord must have a protective conductor and must be undamaged.
 - The mains cable must be mechanically secured with the "Power Input" socket to prevent accidental disconnection.
 - Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Leica PROVIDO, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Note:

The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

3.5 Directions for the operator of the instrument

- ▶ Follow the instructions described here.
- ▶ Follow the instructions given by your employer regarding the organization of work and safety at work.

3.6 Dangers of use



WARNING

Danger of injury due to the PROVIDO moving down!

- ▶ Never rebalance or re-equip with the instrument over the field of operation.
- ▶ Always balance the PROVIDO after re-equipping it.



WARNING

Danger of tilting if load exceeds permitted load!

- ▶ The load placed on the microscope interface must not exceed 8.5 kg.



WARNING

Danger of injury to the eyes.

- ▶ Do not use the PROVIDO in ophthalmology.



WARNING

Danger of injury due to:

- **uncontrolled lateral movement of the arm system**
- **tilting of the stand**
- **feet in lightweight shoes could become trapped beneath the casing of the base**
- ▶ For transportation, always move the PROVIDO surgical microscope into the transport position.
- ▶ Never move the stand while the unit is extended.
- ▶ Never roll over cables lying on the floor.
- ▶ Always push the PROVIDO surgical microscope at the handrail and never pull it.
- ▶ Make sure that the movement range is free.



WARNING

Risk of injury due to downward movement of the surgical microscope!

- ▶ Always lock the parallelogram:
 - when transporting the microscope
 - when re-equipping



WARNING

Danger of eye injury due to possibly hazardous optical infrared and UV radiation.

- ▶ Do not look at the operating lamp.
- ▶ Minimize exposure to eyes or skin.
- ▶ Use appropriate shielding.



WARNING

Risk of injury due to downward movement of the surgical microscope.

- ▶ Complete all preparations and adjustments to the stand before the operation.
- ▶ Never change the accessories or attempt to rebalance the microscope while it is above the field of operation.
- ▶ Before changing accessories, always lock the PROVIDO surgical microscope.
- ▶ Balance the PROVIDO after re-equipping it.
- ▶ Do not release the brakes when the instrument is in an unbalanced state.
- ▶ Before re-equipping during the operation, first swing the microscope away from the operating field.
- ▶ Never carry out the adjustment balancing above the patient.
- ▶ Check fitting and good connection of all parts and cables during the preparation of the system prior to the surgery. Not well fitted parts and bad connections can lead to hazardous situations and system failures.



WARNING

Risk of infection.

- ▶ Always use the PROVIDO surgical microscope with sterile controls and a sterile drape.



WARNING

Danger of fatal electrical shock.

- ▶ The PROVIDO surgical microscope may be connected to a grounded socket only.
- ▶ Operate the system only with all equipment in its proper position (all covers fitted, doors closed).

**WARNING**

Danger of eye injury due to possibly hazardous optical infrared and UV radiation.

- ▶ Do not look at the operating lamp.
- ▶ Minimize exposure to eyes or skin.
- ▶ Use appropriate shielding.

**WARNING**

Danger of burn injuries in otologic surgery.

- ▶ Use the lowest comfortable light intensity.
- ▶ Adjust the field of view to match the operating field.
- ▶ Irrigate the wound frequently.
- ▶ Cover the exposed parts of the pinna with a moist surgical sponge.

**WARNING**

Danger of injury to the eyes.

At a short focal distance, the light source of the illumination unit may possibly be too bright for the operating physician and the patient.

- ▶ Begin with the lower-intensity light source and slowly increase it until the operating physician has an optimally illuminated image.

**WARNING**

Danger of serious damage to tissue due to incorrect working distance.

- ▶ When using lasers, always set the working distance of the microscope to laser distance and lock the microscope in position.
- ▶ Do not adjust the rotary button for manual setting of the working distance while using the laser.

**WARNING**

Danger to the patient due to failure of the working distance motor.

- ▶ If the working distance motor fails, adjust the working distance manually.

**WARNING**

Danger injury to the eyes due to laser radiation.

- ▶ Never point the laser directly or indirectly via reflecting surfaces to the eyes.
- ▶ Never point the laser to the eyes of the patient.
- ▶ Do not look into the laser beam.

**WARNING**

Danger to the patient due to failure of the magnification motor.

- ▶ If the magnification motor fails, adjust the magnification manually.

**CAUTION**

Surgical microscope can move without warning.

- ▶ Always lock the footbrake when you are not moving the system.

**CAUTION**

Damage to the PROVIDO surgical microscope due to uncontrolled tilting.

- ▶ Hold the handle when releasing the brake.

**CAUTION**

Damage to the PROVIDO surgical microscope during transportation.

- ▶ Never move the stand in the extended condition.
- ▶ Always change to transport position before moving the PROVIDO stand.
- ▶ Never roll over cables lying on the floor.
- ▶ Do not drive on ramps with a tilt $\geq 10^\circ$.
- ▶ Do not transport or store the system in areas with an elevation angle bigger than 10° .
- ▶ Do not tilt the system to more than 10° as it might tip over.
- ▶ Only move the PROVIDO in transport position.

**CAUTION**

Damage to the PROVIDO surgical microscope due to uncontrolled tilting.

- ▶ Grasp the handles securely before pressing the ALL-FREE button.

**CAUTION**

There is a risk of damage to the surgical microscope from uncontrolled tilting!

- ▶ Firmly hold the handles before triggering the "All Brakes" function.



CAUTION

Risk of infection.

- ▶ Leave sufficient space around the stand to ensure that the sterile drape does not come into contact with non-sterile components.
-



CAUTION

Risk of damage.

- ▶ Before lifting the microscope make sure that the area above the stand is clear to avoid collisions with OR lamps, ceiling etc.
 - ▶ Make sure that the movement range is free before you move the arm with the monitor.
 - ▶ Parts of the stand might collide with the ceiling, wall or other equipment in the environment. Make sure that the movement range is free before you move the microscope or stand.
 - ▶ Only move the surgical microscope when all brakes are released.
-



CAUTION

Risk of overheating of the system.

Covering the air inlet can result in a controlled shutdown of the system due to overheating.

- ▶ Make sure the air inlet is always kept free.
-



CAUTION

If the field diameter is greater than the field of view and the light intensity is too high, uncontrolled tissue heating may occur outside of the area visible through the microscope.

- ▶ Do not set the light intensity too high.
-



CAUTION

Destruction of the magnification motor.

- ▶ Only adjust the magnification manually if the magnification motor is defective.
-



CAUTION

Destruction of the working distance motor.

- ▶ Only adjust the working distance manually if the working distance motor is defective.
-



CAUTION

Damage to the touch panel.

- ▶ Operate the touch panel using your fingers only. Never use hard, sharp or pointed objects made out of wood, metal or plastic.
 - ▶ Never clean the touch panel using cleaners that contain abrasive substances. These substances can scratch the surface and cause it to become dull.
-



CAUTION

Danger to the patient due to changes in the user settings.

- ▶ Never change the configuration settings or edit the user list during an operation.
 - ▶ Check fitting and good connection of all parts and cables during the preparation of the system prior to the surgery. Not well fitted parts and bad connections can lead to hazardous situations and system failures.
-



CAUTION

Danger of skin burns. The lamp insert gets very hot.

- ▶ Check that the cover has cooled before you replace the lamp.
 - ▶ Do not touch the hot lamp insert.
-



CAUTION

Damage to the PROVIDO surgical microscope during transportation!

- ▶ Never move the stand in the extended condition.
 - ▶ Never roll over cables lying on the floor.
 - ▶ Do not transport or store the system in areas with an elevation angle bigger than 10°.
-

**CAUTION****Damage to the housing of the stand or to the touch panel of the control unit!**

If the optics carrier is moved into the transport position or from the transport position to the operating position:

- ▶ Ensure that the transport lock must be locked.
-

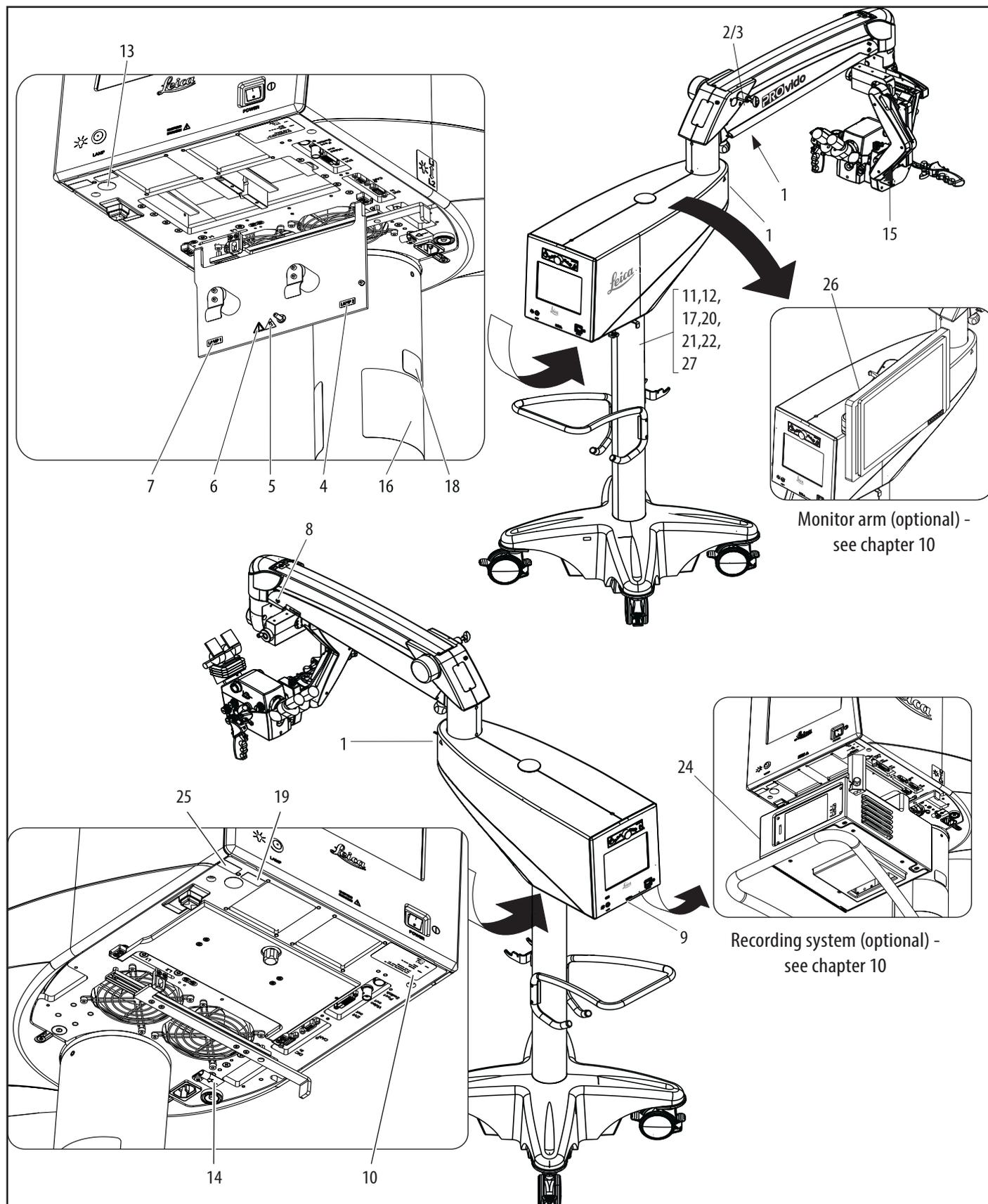
**CAUTION****Damage to other medical equipment or injury to personnel.**

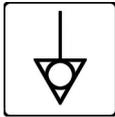
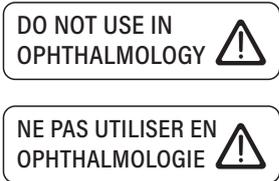
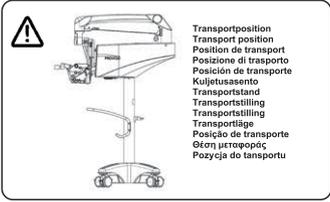
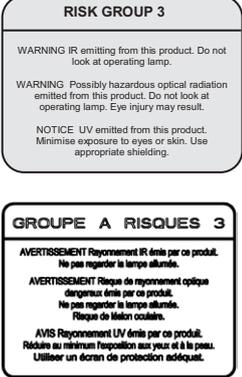
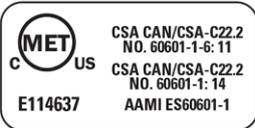
- ▶ Take care of monitor movement when rotating the tower. The monitor will move together with the tower and can collide with other medical equipment or personnel.
-

**CAUTION****Risk of damage.**

- ▶ Only move the surgical microscope when all brakes are released.
-

3.7 Signs and labels



1		Danger sign for squeezing hazard	13		Mandatory label - read the user manual carefully before operating the product. Web address for electronic version of the user manual.
2		Open			
3		Closed			
4					
5		Danger sign for hot surface			Medical Device
6			14		Equipotential bonding
7			15		Laser label
8		Max. load for optics carrier			
9		Contraindication	16		
10		Type label	17		Warning of XENON light emission
11		Grounding label (only USA and Canada)	18		System weight label
12		MET label	19		Fabrication label a Reference number b Serial number

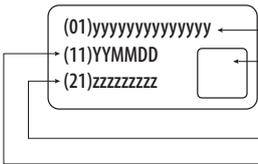
20  ANVISA Registration number (only brazil)

21  INMETRO label (only brazil)

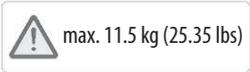
22  Lamp Switch Label

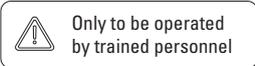
23  Lamp On/Off

24  LAN (Local Area Network) Label (Optional)

25  UDI Label

- ← Device Identifier (DI)
- ← GS1 Data Matrix Code
- ← Production Identifier (PI)
- ← Serial number
- ← Date of manufacturing

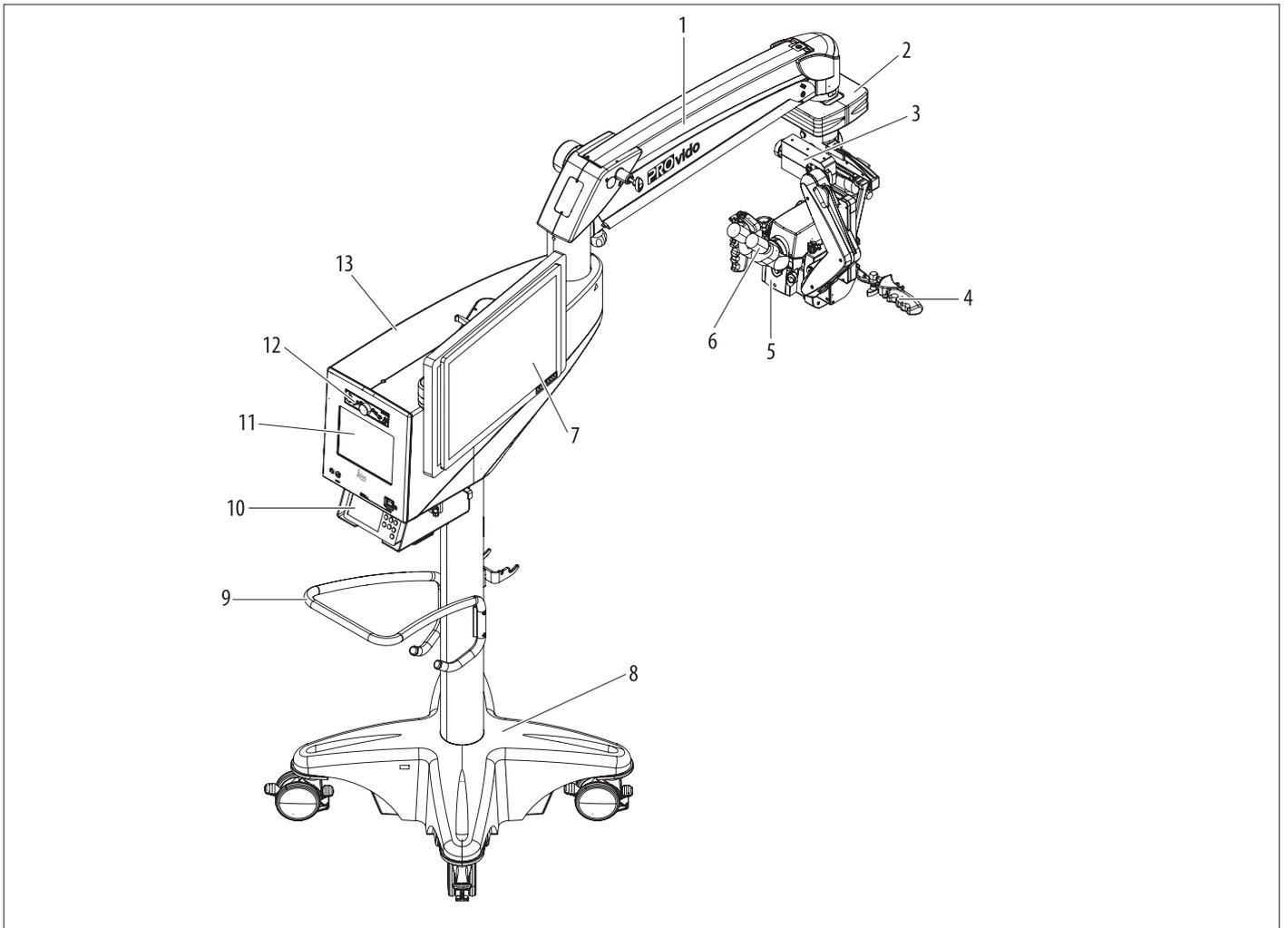
26  Max. load for monitor arm. (located on optional monitor mounting plate)

27  Warning trained personnel



4 Design

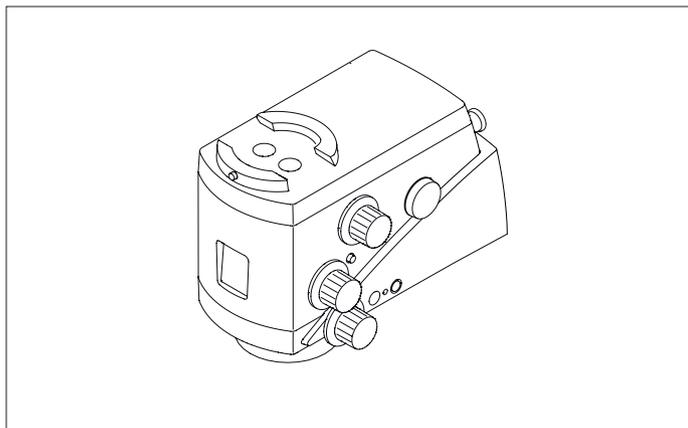
4.1 PROVIDO stand



- 1 Articulated arm (also referred to as Parallelogram)
- 2 XY coupling (optional)
- 3 C-sledge
- 4 Handles
- 5 Leica M530 optics carrier
- 6 Tubes
- 7 Video monitor (optional)
- 8 Base
- 9 Handrail
- 10 Documentation system (optional)
- 11 Control unit
- 12 Camera control unit (optional)
- 13 Horizontal arm

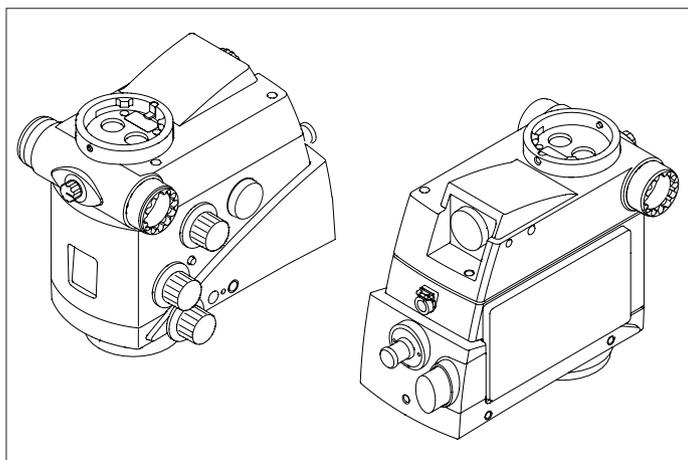
4.2 Leica M530 Optics carriers

4.2.1 Leica M530 with Top plate



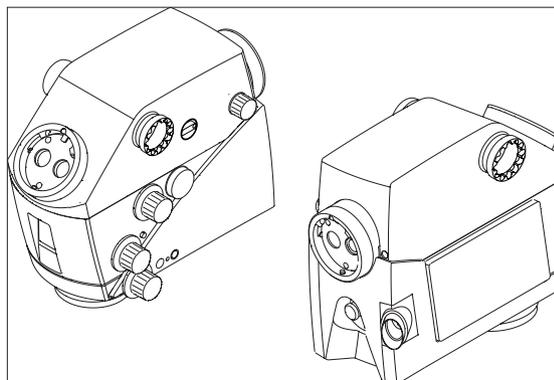
- Basic optics carrier

4.2.2 Leica M530 with IVA530



- Optics carrier with integrated C-mount video adapter for installing a camera
- Assistant interface, switchable either to the left or to the right side

4.2.3 Leica M530 with ULT530



- Optics carrier with integrated camera for visible light Leica HD C100 (optional)
- Interface for assistants, either to the left and right side or to the back
- Main surgeon and back assistant interface, 360° rotatable both
- Back assistant interface with fine focus knob

! Optional accessories to the optics carrier and their functions are described in the corresponding user manual.

5 Functions

5.1 Balancing system

With a balanced PROVIDO you can move the optics carrier in any position without tilting or falling down. After balancing all movements during operation only need a minor force.

5.1.1 Balancing the PROVIDO



WARNING

Danger of fatal electric shock!

- ▶ The PROVIDO may be connected to a grounded safety socket only.

- ▶ Connect the instrument to the power supply.

Installing the accessories



WARNING

Danger of injury due to the PROVIDO moving down!

- ▶ Never rebalance or re-equip with the instrument over the field of operation.
- ▶ Always balance the PROVIDO after re-equipping it.

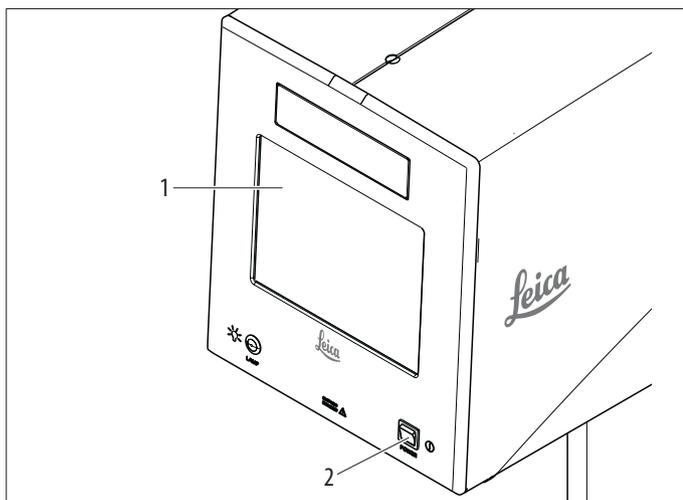


WARNING

Danger of tilting if load exceeds permitted load!

- ▶ The load placed on the microscope interface must not exceed 8.5 kg.

- ▶ Install the necessary accessories on the PROVIDO (see page 26).
- ▶ Turn on the power switch (2) on the control unit. LED in power switch lights up.

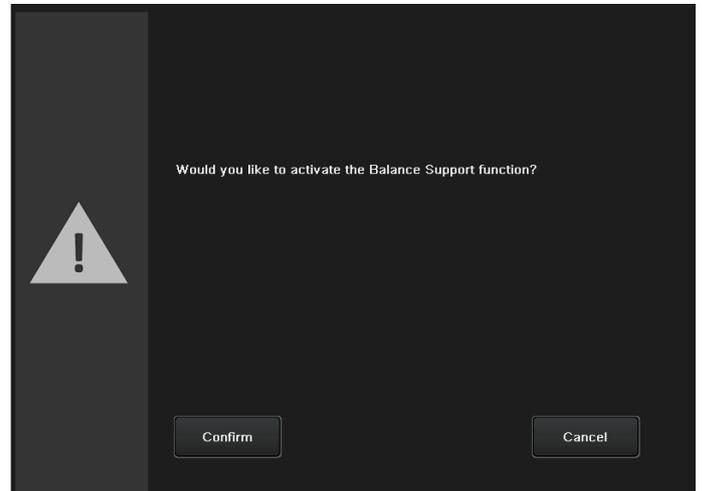


Balancing the PROVIDO



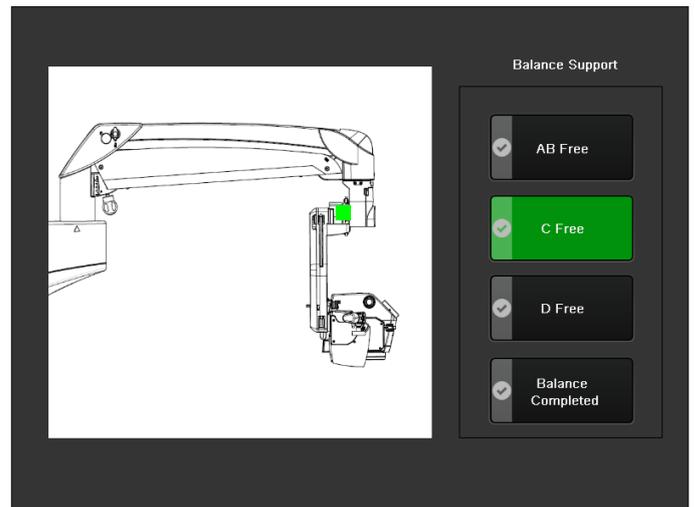
In some cases, certain equipment configurations may not be balanceable in the A and B balancing range. A list of balanceable configurations is provided in the technical data (see page 63).

- ▶ Move the tubes (binocular tube, attachment for second observer, videozoom tube) to the operating position.
- ▶ Press the "Balance Support" button on the touch panel (1).
- ▶ Press the "Confirm" button for the following message on the touch panel (1).



Position the PROVIDO horizontally.

- ▶ Press the "C Free" button. The button illuminates in green.



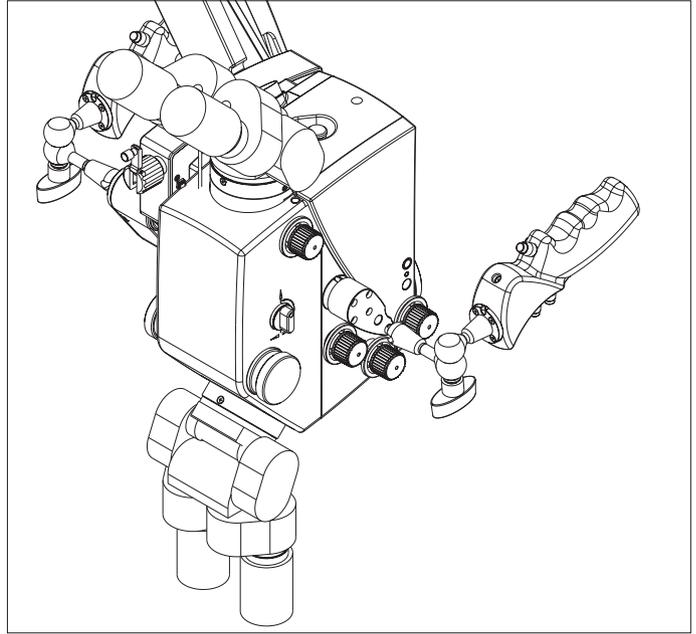
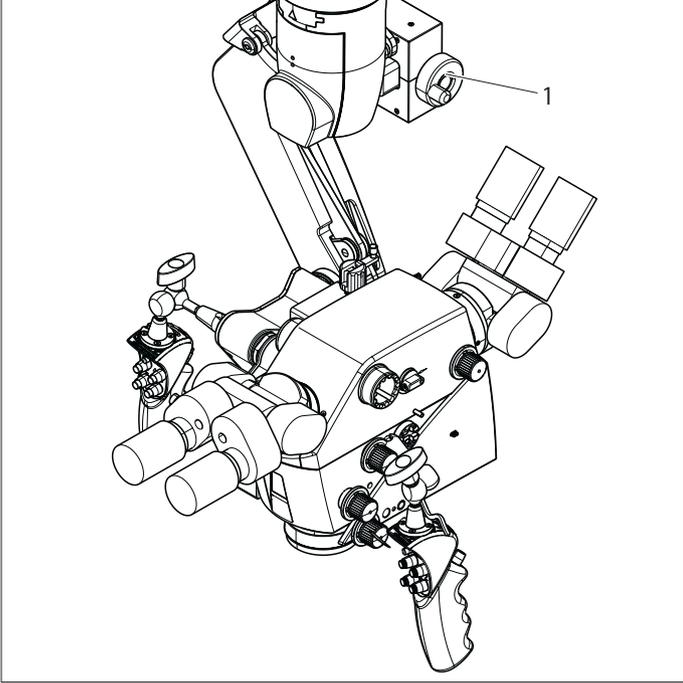
- ▶ Press the ALL-FREE button. This frees the C brake.

The PROVIDO tilts left:

- ▶ Turn rotary knob C (1) clockwise until the PROVIDO is in balance with the brakes released.

The PROVIDO tilts right:

- ▶ Turn rotary knob C (1) counter-clockwise until the PROVIDO is in balance with the brakes released.



The PROVIDO tilts forward:

- ▶ Turn rotary knob B (2) counter-clockwise until the PROVIDO is in balance with the brakes released.

The PROVIDO tilts backward:

- ▶ Turn rotary knob B (2) clockwise until the PROVIDO is in balance with the brakes released.
- ▶ Position the PROVIDO horizontally back to the working position.



To avoid sudden tilting when the breaks are released, we recommend to hold the handle and to slowly let go.

- ▶ Press the "AB Free" button.

The button illuminates in green.

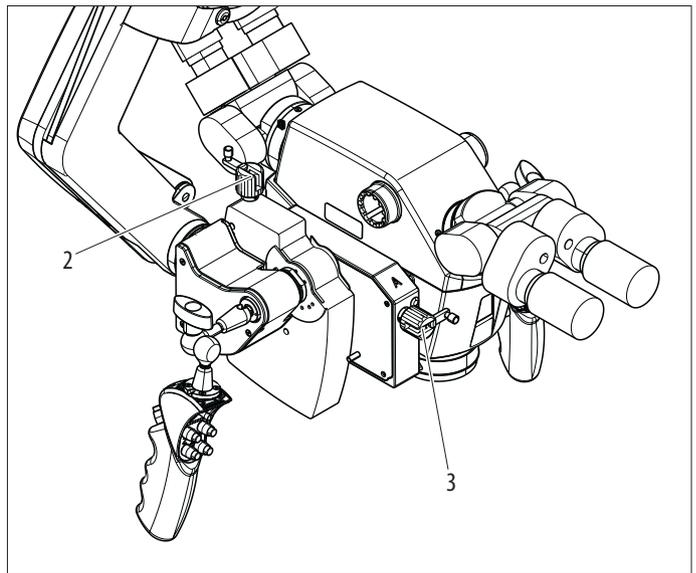
Press the ALL-FREE button.

This frees the AB brake.

The PROVIDO tilts backward:

- ▶ Turn rotary knob A (3) counter-clockwise until the PROVIDO is in balance with the brakes released.

Tilt the PROVIDO by 90°.



Adjust rotary knob C (1) until the microscope carrier is balanced.

- ▶ Press the "D free" button.

The button illuminates in green.

- ▶ Hold the microscope firmly.

Pull the stop lever (4) and rotate it into a horizontal position.
The transport lock is released.

- ▶ Press the ALL-FREE button.

This frees the D brake.

- ▶ See whether or not the microscope drifts with the articulate arm in horizontal position.

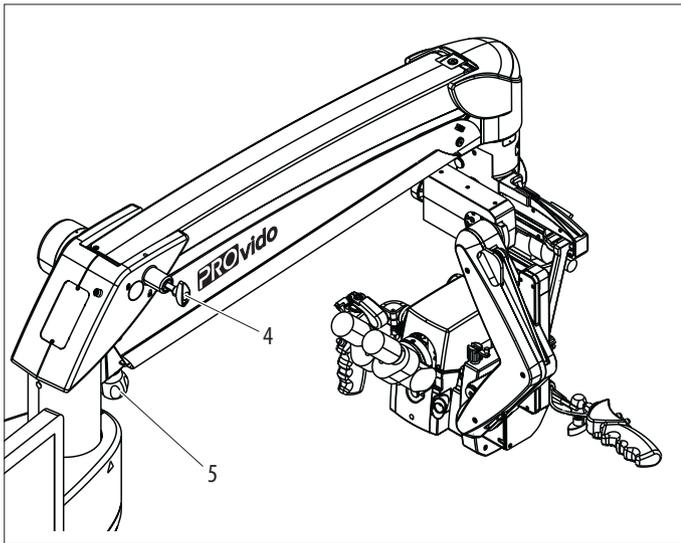
Microscope drifts downwards:

Turn rotary knob (5) clockwise.

Microscope drifts upwards:

- ▶ Turn rotary knob (5) counter-clockwise.
- ▶ Press the "Balancing completed" button after achieving the balanced state in which the microscope does not drift up or down on its own.

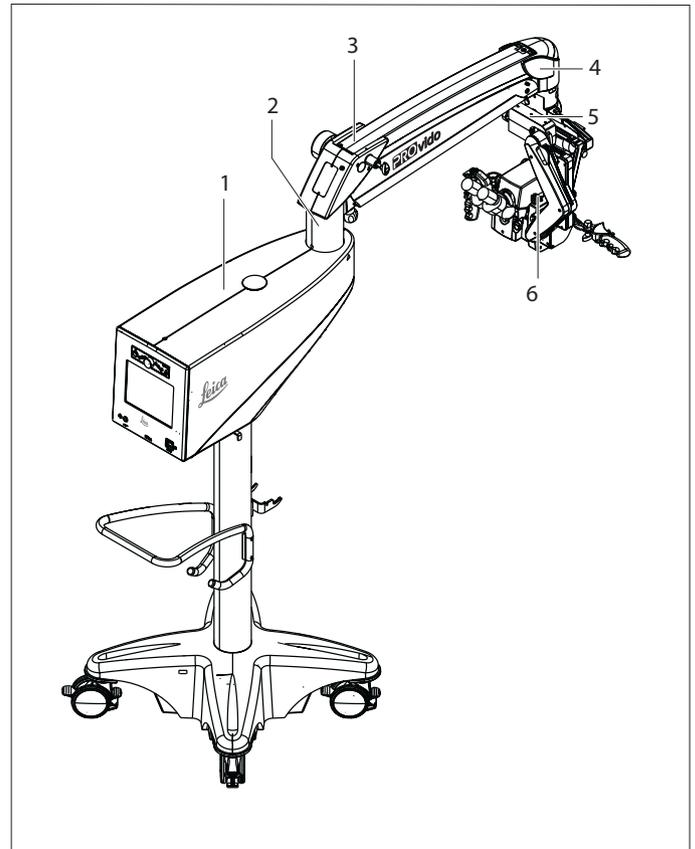
The system is balanced.



- ▶ **!** If the rotary knob (5) cannot be turned easily, hold the articulate arm higher or lower in a position where the rotary knob can be turned easily.

5.2 Brakes

The PROVIDO has 6 electromagnetic brakes which stop the movements of the stand and surgical microscope:



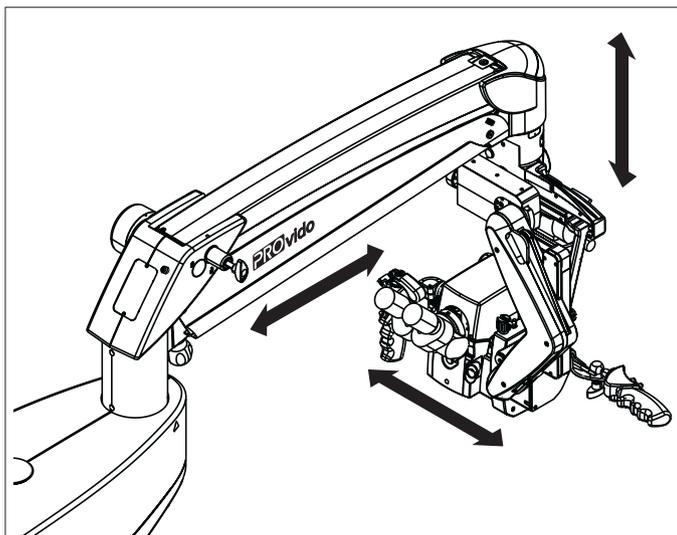
- 1 Horizontal at column
- 2 Horizontal front
- 3 Up/down in parallelogram
- 4 In the rotary joint
- 5 In the C sledge of the microscope carrier
- 6 At the A/B sledges of the surgical microscope

Brakes are operated via the handle.

The button of the handle with the assigned function "Selected Brakes" (refer also to the chapter on "Assigning handles", page 45) can trigger different brake combinations. The selected brakes can be freely configured, see chapter 9.3.9.

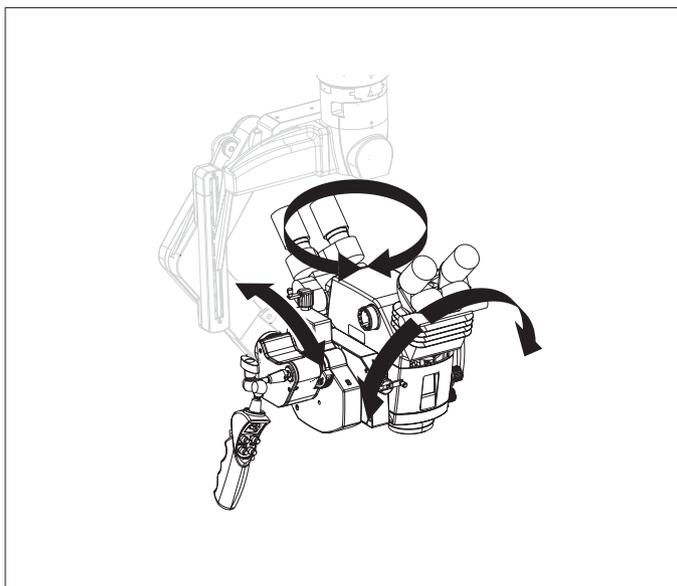
5.2.1 Selected Brakes – XYZ Free

The following movements can be performed with the surgical microscope when the brake combination "XYZ Free" is activated:



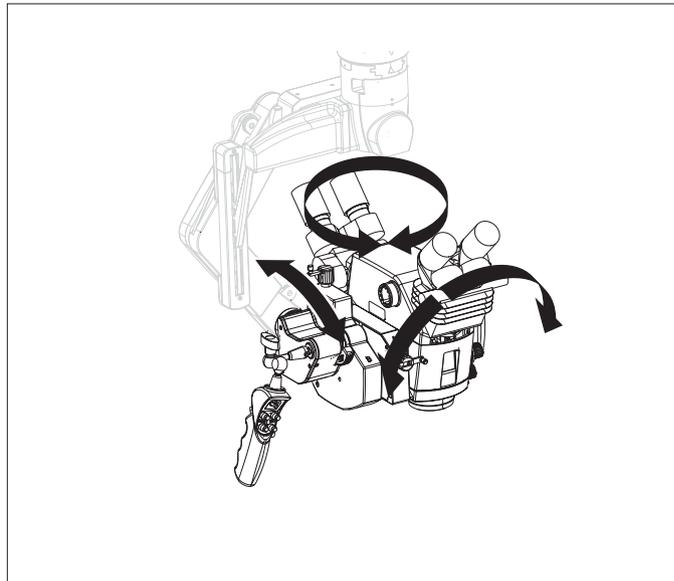
5.2.2 Selected Brakes – Focus Lock

The following movements can be performed with the surgical microscope when the brake combination "Focus Lock" is activated:



5.2.3 Selected Brakes – Carrier Free

The following movements can be performed with the surgical microscope when the "Carrier Free" mode is activated:



The Carrier Free mode has the following difference to the Focus Lock:

In the Carrier Free mode the handle button has to be pressed only once while in the Focus Lock mode the handle button has to be pressed and held.



It is advisable to ensure that the PROVIDO is in balance stage before turning ON this function.

5.3 Illumination

The main illumination of the PROVIDO is a xenon lamp and is located in the stand. Illumination is routed to the optics carrier via fibre optic light guide.

The backup lamp can be either another xenon lamp or a LED lamp. In case of a failure of the lamp in use, the other lamp can be selected manually with the sliding switch below the horizontal arm (see page 21).

5.3.1 AutoIris

Autolris synchronizes the illumination field automatically according to the magnification factor.

Using the manual override, the illumination field can be adjusted manually.

5.3.2 BrightCare Plus

BrightCare Plus is a safety function which automatically limits the maximum brightness depending on the working distance. Excessively bright light can, in combination with a short working distance, cause burns in patients.



When shipped from the factory, the "BrightCare Plus" safety function is activated for all users.

Luminous energy

The optics of the PROVIDO have a variable working distance of between 225 and 600 mm. For Xenon lamp 300 W the system is designed in such a way that it delivers sufficient light to produce a bright image even at a long working distance of 600 mm. In accordance with the formula $E_v = I_v / d^2$, the light quantity continually increases by 710 % when the working distance is changed from 600 to 225 mm.

(E_v = light intensity, I_v = brightness, d = distance from light source).

This means that less light is required to work with the microscope at a shorter distance than at a greater distance.



It is advisable to begin with a low light intensity and increase it until an optimum level of illumination is achieved.

Heat release

Heat from non-visible light (over 700 nm) is filtered out of the light from the used xenon light source. Nevertheless, white light also always develops heat. An excessive amount of white light can lead to overheating of tissue and metal objects.



It is advisable to begin with a low light intensity and increase it until an optimum level of illumination is achieved.

BrightCare Plus display



When BrightCare Plus is activated, the red line on the brightness adjustment bar shows the maximum adjustable brightness for the current working distance.

The brightness cannot be set to a level beyond the red line unless the BrightCare Plus function is intentionally deactivated.

When the working distance is reduced too much at a set brightness, the brightness is reduced automatically.

5.4 Leica FusionOptics

This feature provides an augmentation in resolution and depth of field for an ideal 3-D optical image.

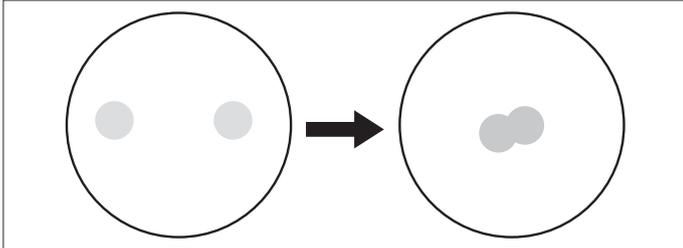
Leica FusionOptics operates with two separate beam paths with different information: the left beam path is optimized for high resolution, the right beam path for optimum depth of field.

The human brain merges these two very different images to a single, optimal spatial image.

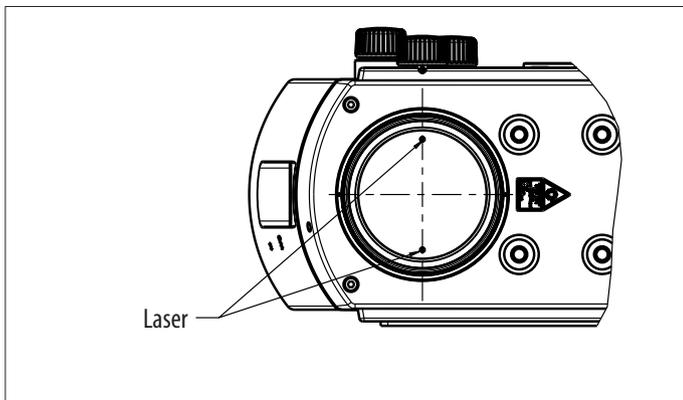
5.5 Leica SpeedSpot

PROVIDO is equipped with the Laser focussing aid Leica SpeedSpot. If Leica SpeedSpot is activated for the current user (see page 46), the focussing aid is released when the brakes are released or when focussing.

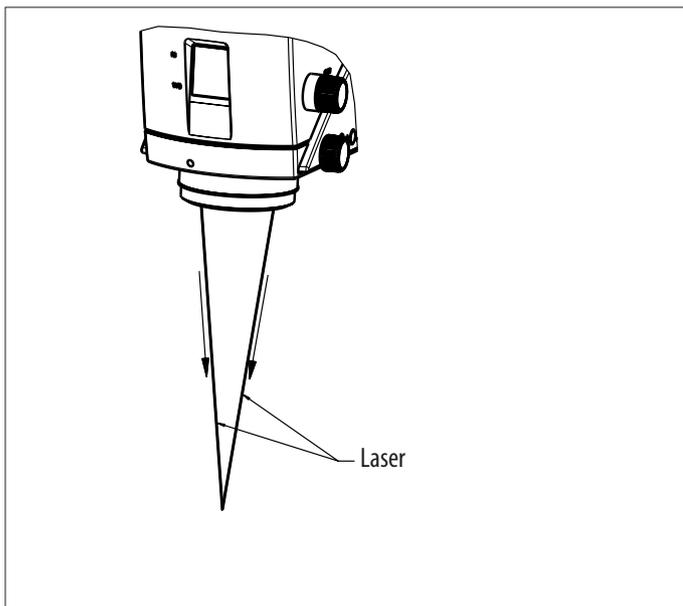
Two convergent light beams meet exactly in the focussing point of the microscope.



Exit of the laser beams

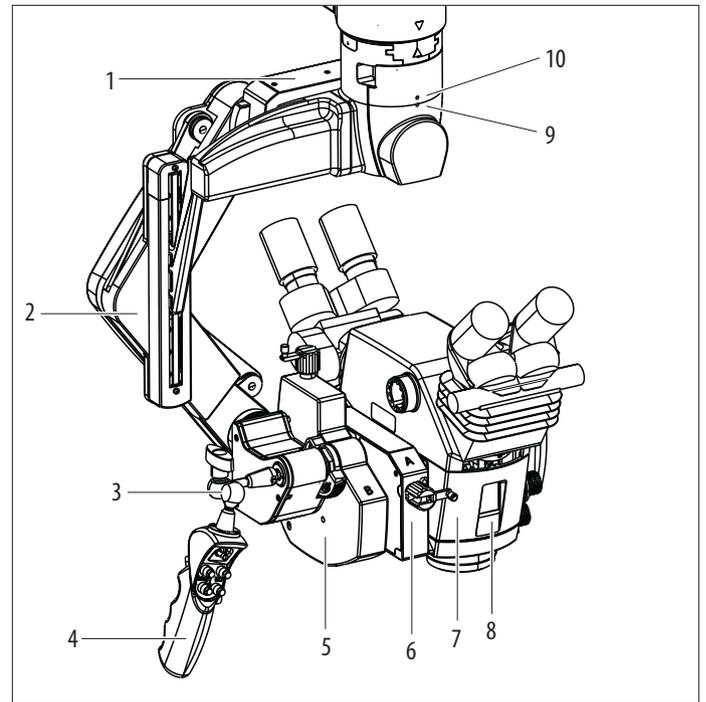


Course of the laser beams



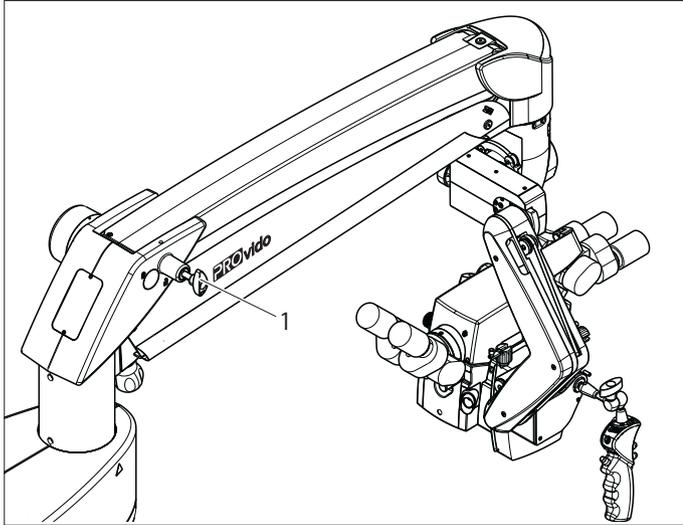
6 Controls

6.1 PROVIDO microscope with arm system



- 1 C sledge
- 2 Microscope carrier
- 3 Handle clamping lever
- 4 Handle
- 5 B sledge
- 6 A sledge
- 7 Optics carrier
- 8 Display of set working distance and magnification
- 9 Status LED for fluorescence recording
LED lights up red = recording in progress
- 10 Status LED for fluorescence
 - LED OFF: Fluorescence not available
 - Yellow color LED ON: Fluorescence FL800 is now in operation.
 - Cyan color LED ON: Fluorescence FL560 is now in operation.

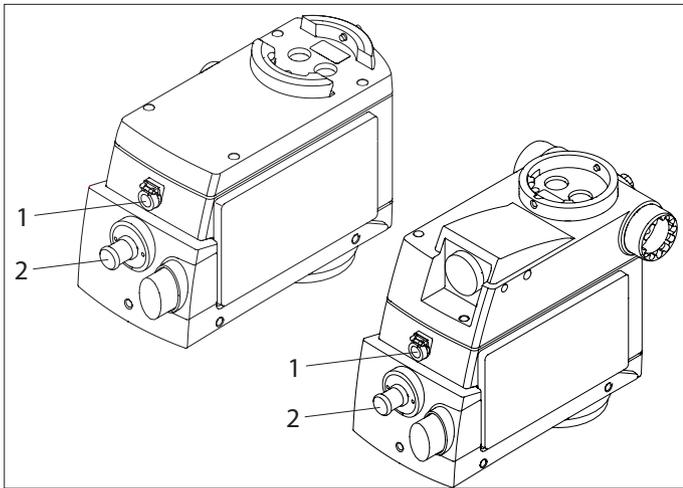
6.1.1 Lock



1 Stop lever – locking in horizontal direction

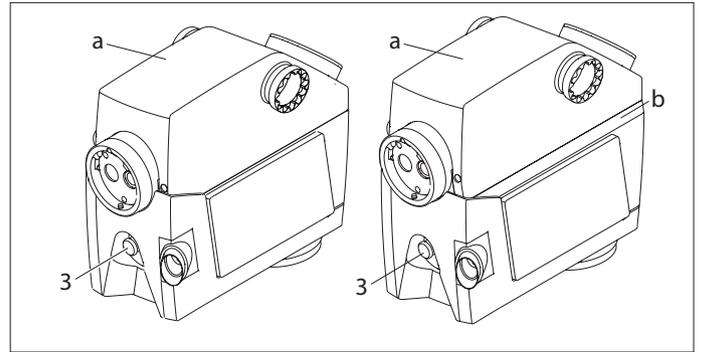
6.1.2 Optics carrier – rear

Leica M530 with Top plate / Leica M530 with IVA530



1 CAN socket (Leica M530 with Top plate and IVA530 only)
2 Optical fiber connection

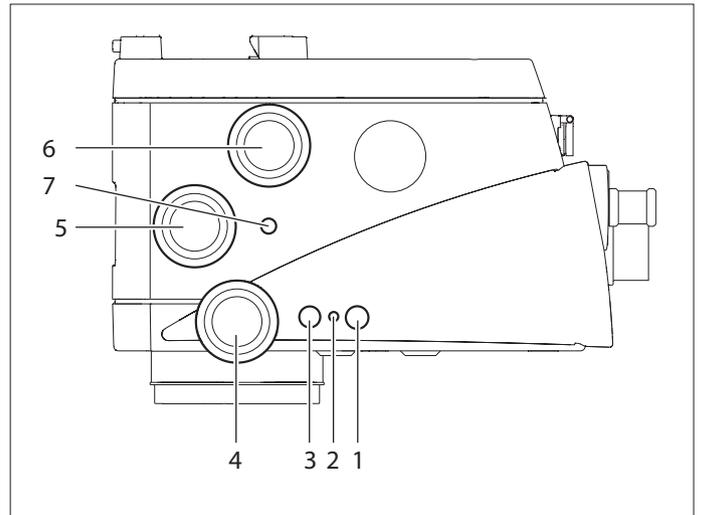
Leica M530 with ULT530/Leica FL800 ULT (a) or with Leica FL560 for M530 (b)



3 Optical fiber connection

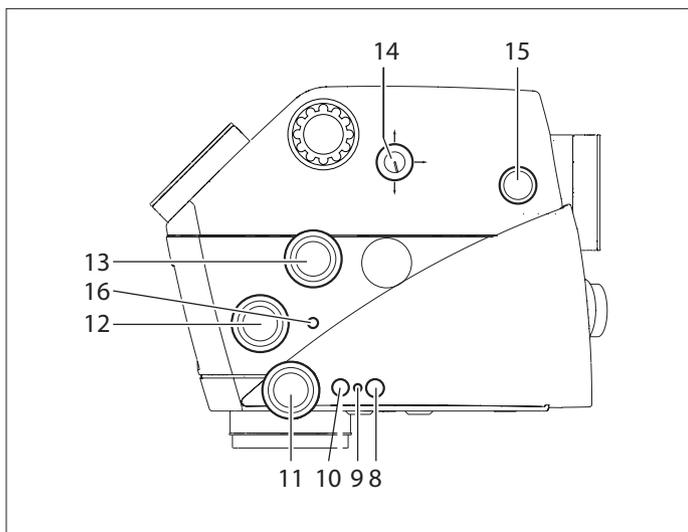
6.1.3 Optics carrier – controls

Leica M530 with Top plate / Leica M530 with IVA530



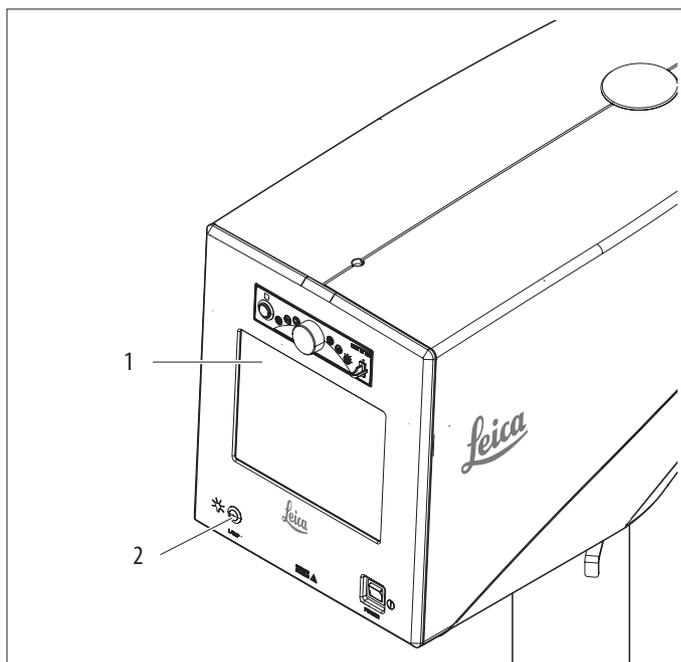
1 Button "Focus lock" (counter-sunk)
2 LED Focus lock active
3 Receiver Remote Control Camera
4 Rotary knob "Working distance" (emergency operation only)
5 Rotary knob "Manual override Autoliris"
6 Rotary knob "Magnification" (emergency operation only)
7 Button "Reset Autoliris"

Leica M530 with ULT530 / Leica FL560 for M530 or with Leica FL800 ULT



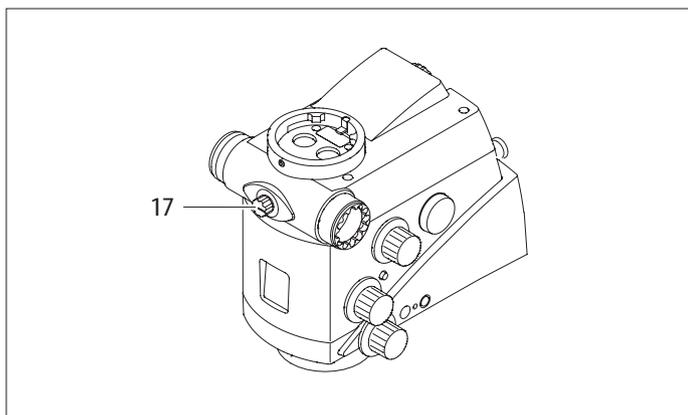
- 8 Button "Focus lock" (counter-sunk)
- 9 LED Focus lock active
- 10 Receiver Remote Control Camera
- 11 Rotary knob "Working distance" (emergency operation only)
- 12 Rotary knob "Manual override Autoliris"
- 13 Rotary knob "Magnification" (emergency operation only)
- 14 Assistant back/side
- 15 Fine focus back assistant
- 16 Button "Reset Autoliris"

6.2 Control unit



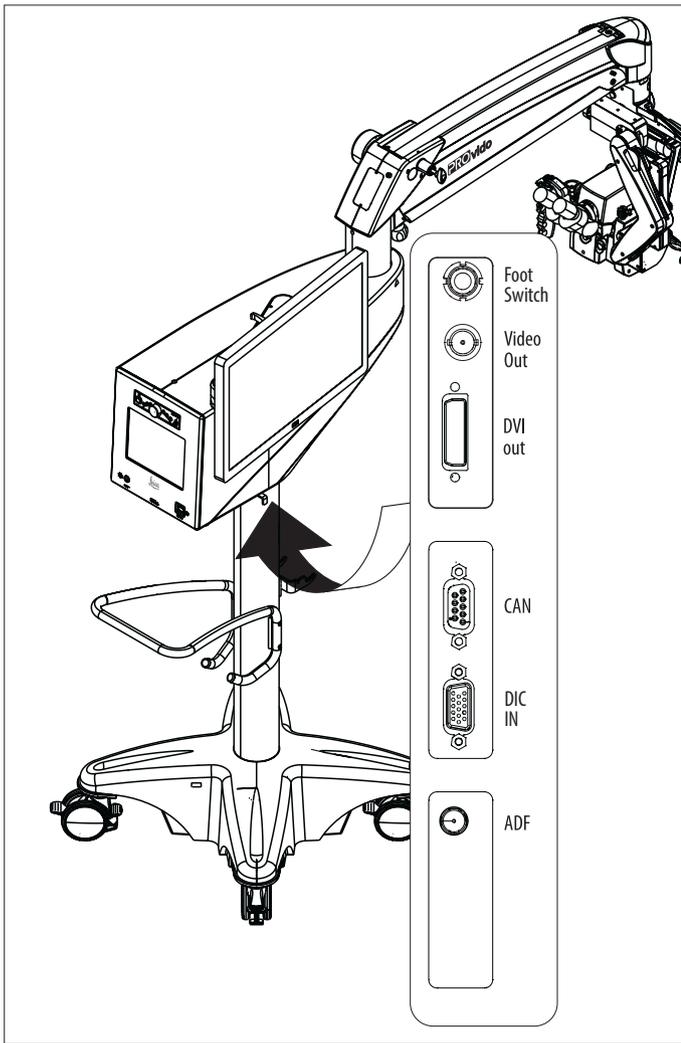
- 1 Touch panel
- 2 Push-button with illumination LED (On/Off)

Leica M530 with IVA530



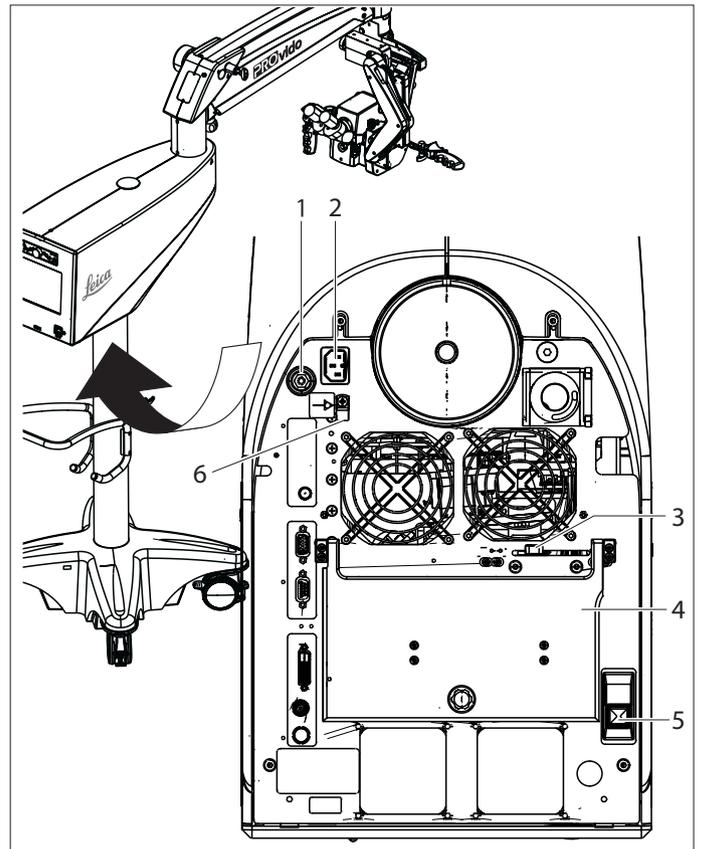
- 17 Assistant right/left

6.3 Terminals



Footswitch	to connect receiver for second Footswitch
Video out	to connect an external monitor (analog CVBS)
DVI out	to connect an external monitor
CAN	to connect CAN devices
DIC in	Not active
AD.F.	Additional Function

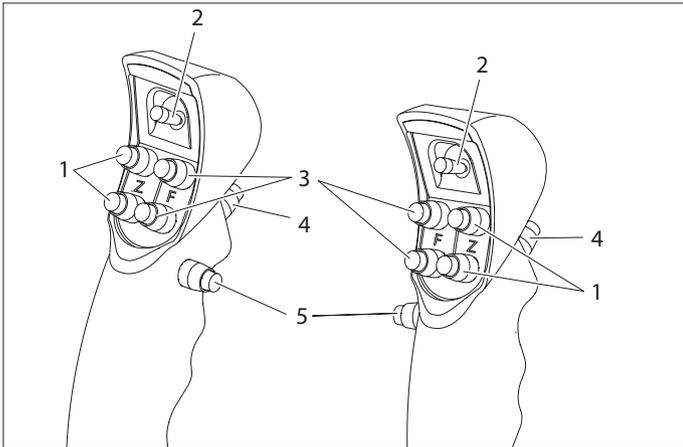
6.4 Stand



- 1 Equipotential bonding socket
For connecting the PROVIDO to an equipotential bonding device. This is part of the customer's building installation. Observe the requirements of EN 60601-1 (§ 8.6.7).
- 2 Power input
- 3 Illumination sliding switch (lamp 1 / lamp 2)
- 4 Access door illumination unit
- 5 Circuit Breaker Switch
- 6 Power cord cable clip

! The PROVIDO has a primary illumination source and an equivalent standby illumination source.

6.5 Handles



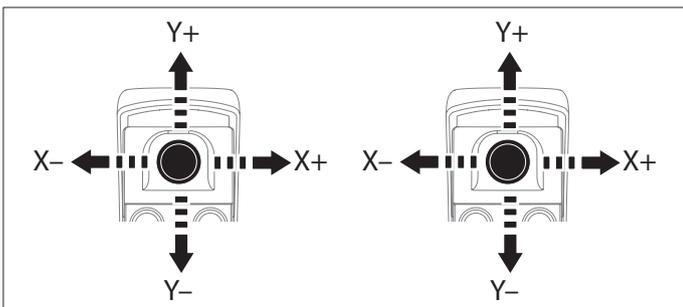
Assignment in the factory setting

- 1 Magnification
- 2 4-function joystick
- 3 Working distance
- 4 Release all brakes
- 5 Release preselected brakes

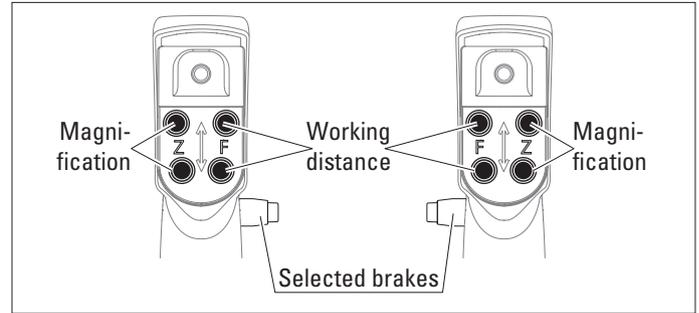
! You can assign switches 1, 2, 3 and 5 of the handles individually for each user in the configuration menu. In all presets, key (4) releases all brakes. This key cannot be configured. For the joystick and the other keys presets are available according to your task.

6.5.1 Presets for Cranial / Spinal / ENT

Handles – Joystick (available with premium handles only)



Handles – Buttons



6.6 Footswitch

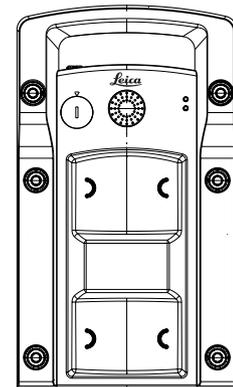
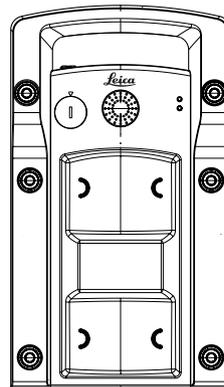
This is an overview of all possible footswitches you can use to control your PROVIDO.

Footswitch

- 12 functions
- crosswise

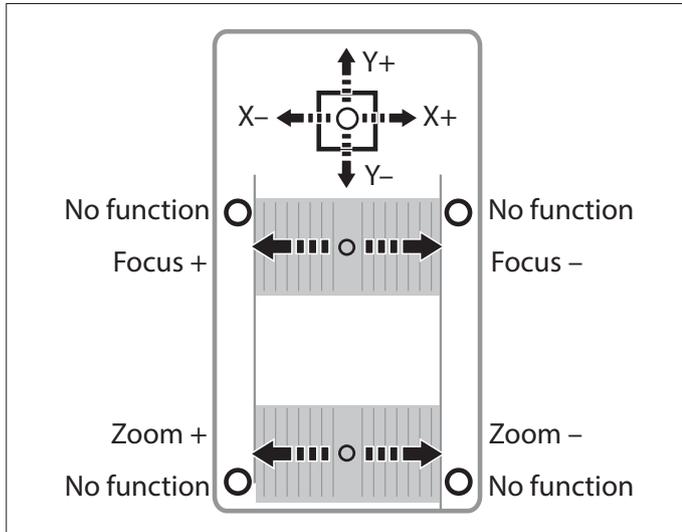
Footswitch

- 14 functions
- crosswise



! • Footswitches can be assigned individually for each user in the configuration menu.

6.6.1 Presets for Cranial / Spinal / ENT



7 Preparation before surgery

7.1 Transportation

**WARNING****Danger of injury due to:**

- **uncontrolled lateral movement of the swing arm**
 - **tilting of the stand**
 - **feet in lightweight shoes could become trapped beneath the base**
- ▶ For transportation, always move the PROVIDO into the transport position.
 - ▶ Never move the stand in the extended condition.
 - ▶ Never roll over cables lying on the floor.
 - ▶ Always push the PROVIDO – never pull it.
 - ▶ Make sure that the movement range is free.

**CAUTION****Surgical microscope can move without warning.**

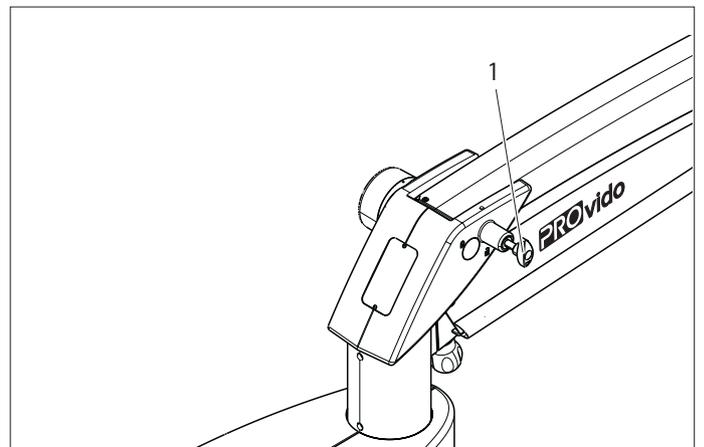
- ▶ Always lock the footbrake when you are not moving the system.

**CAUTION****Damage to the PROVIDO due to uncontrolled tilting.**

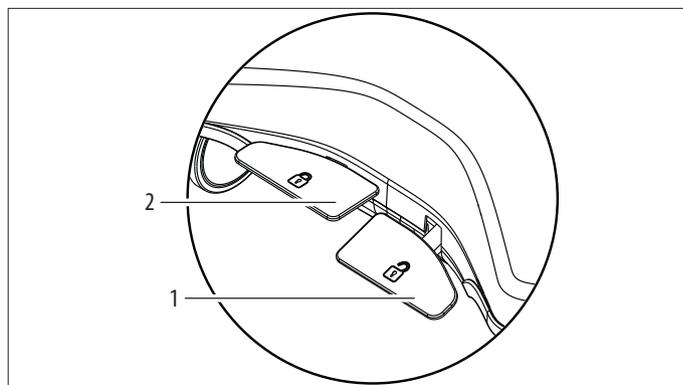
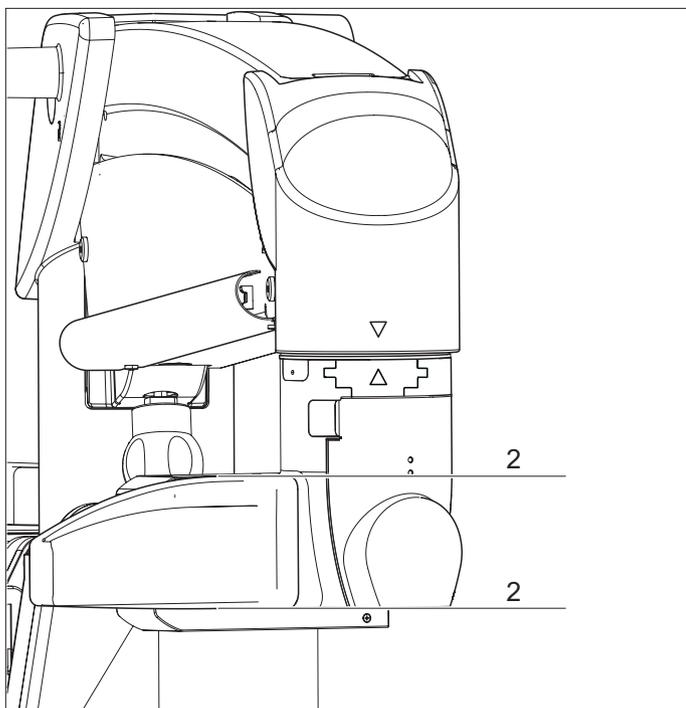
- ▶ Grasp the handles securely before pressing the ALL-FREE button.

Returning the PROVIDO to the transport position

- ▶ Pull the stop lever (1) and rotate it into a vertical position.



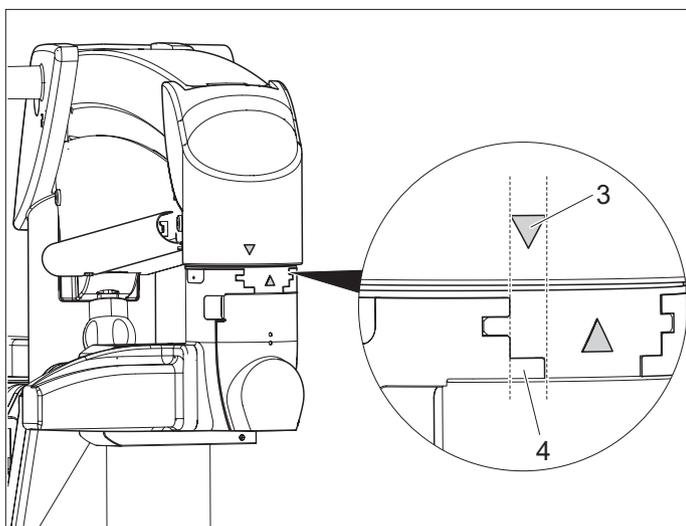
- ▶ Hold the handles and press the ALL-FREE button.
- ▶ Move the swing arm up and down until the transport lock engages.
- ▶ Align the C sledge to horizontal position (2).



- ▶ Ensure that the PROVIDO is in the transport position.
- ▶ Bring swing arm into transport position.
- ▶ Release the ALL-FREE button.
- ▶ Shut off the instrument and disconnect it from the power supply.
- ▶ Hook the cable on the handrail.
- ▶ Press the footbrake pad on the right (1) to unlock the castor wheels lock.
- ▶ Move the microscope using the handle.
- ▶ Press the footbrake pad on the left (2) to lock the castor wheels lock.

! Make sure that the video monitor does not collide with the horizontal arm and swing arm of the stand.

- ▶ Turn the microscope carrier slightly offset in a way that the top red arrow (3) points to the first segment (4).



- ▶ Bring the microscope carrier into transport position. During this process still maintaining the microscope carrier offset as explained above.

7.2 Locking/unlocking the PROVIDO

7.2.1 Locking the parallelogram



WARNING

Risk of injury due to downward movement of the surgical microscope!

- ▶ Always lock the parallelogram:
 - when transporting the microscope
 - when re-equipping

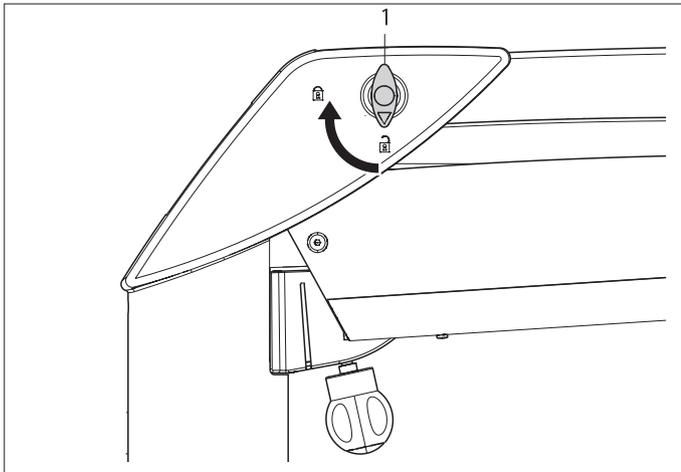


CAUTION

There is a risk of damage to the surgical microscope from uncontrolled tilting!

- ▶ Firmly hold the handles before triggering the "All Brakes" function.

- ▶ Pull the transport lock (1) and bring it into a horizontal position.



- ▶ Hold and turn one or both handles to release the brakes (All Brakes).
- ▶ Move the parallelogram up and down until the transport lock engages.

The parallelogram is now locked.

7.2.2 Releasing the parallelogram

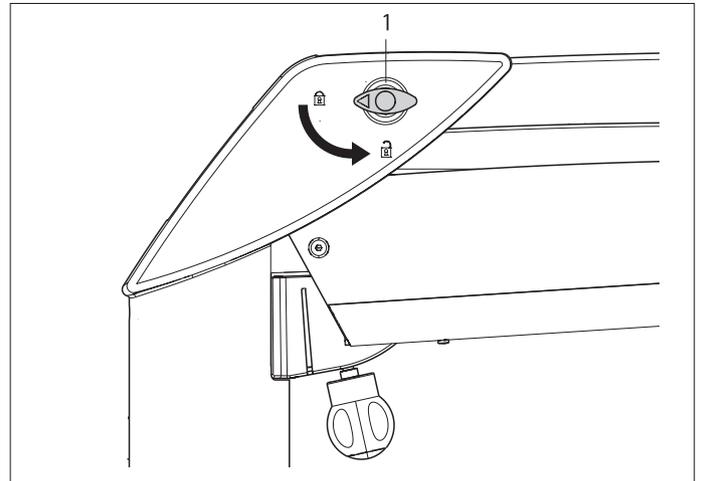


CAUTION

There is a risk of damage to the surgical microscope from uncontrolled tilting!

- ▶ Firmly hold the handles before triggering the "All Brakes" function.

- ▶ Grip and turn one handle to release the brakes.
- ▶ At the same time, pull the transport lock (1) and bring it into a vertical position.



The parallelogram is now released.



If necessary, rebalance the parallelogram.

7.3 Installing optical accessories



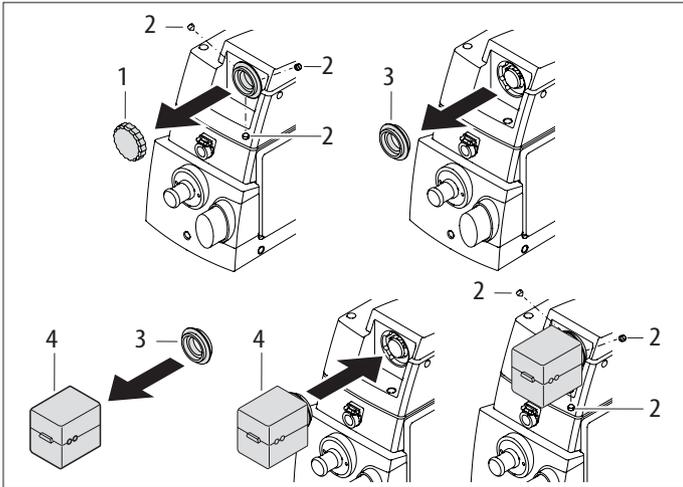
WARNING

Risk of injury due to downward movement of the surgical microscope.

- ▶ Complete all preparations and adjustments to the stand before the operation.
- ▶ Never change the accessories or attempt to rebalance the microscope while it is above the field of operation.
- ▶ Before changing accessories, always lock the PROVIDO.
- ▶ Balance the PROVIDO after re-equipping it.
- ▶ Do not release the brakes when the instrument is in an unbalanced state.
- ▶ Before re-equipping during the operation, first swing the microscope away from the operating field.
- ▶ Never carry out the adjustment balancing above the patient.
- ▶ Check fitting and good connection of all parts and cables during the preparation of the system prior to the surgery. Not well fitted parts and bad connections can lead to hazardous situations and system failures.

- ▶ Make sure that the optical accessories are clean and free of dust and dirt.

7.3.1 Installing a C-mount camera



- ▶ Remove the cover (1) from the c-mount adapter.
- ▶ Loosen the screw (2).
- ▶ Remove the adapter (3).
- ▶ Set the camera (4) to the adapter (3).
- ▶ Install and adjust camera (4) with adapter (3).
- ▶ Fix the screw (2).

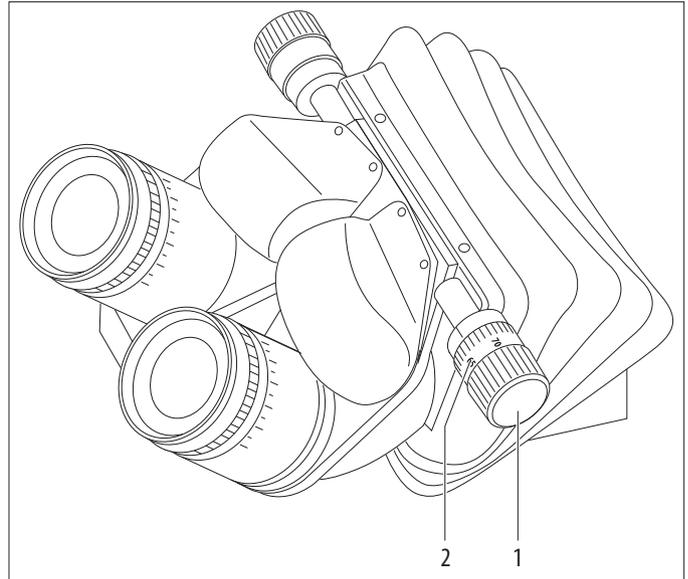


For further information refer to the user manual of the camera.

7.4 Setting the binocular tube

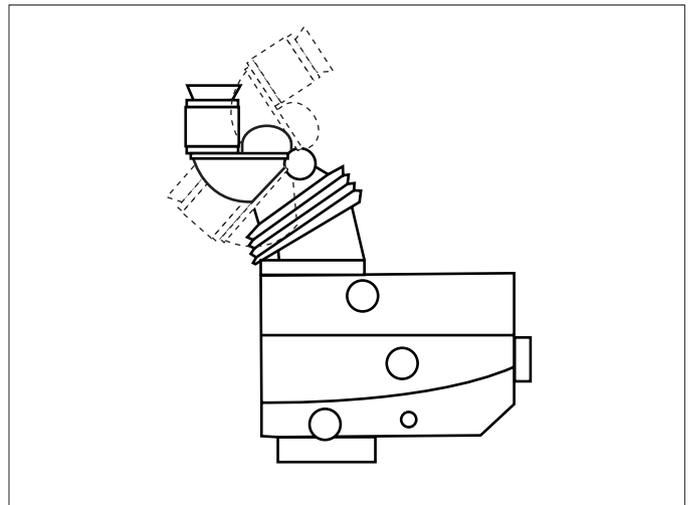
7.4.1 Setting the interpupillary distance

- ▶ Adjust the interpupillary distance to a value between 55 mm and 75 mm.
- ▶ Using the adjusting wheel (1), set the interpupillary distance such that a circular image field can be seen.



7.4.2 Adjusting the tilt

- ▶ Hold the binocular tubes with both hands.
- ▶ Tilt the binocular tube upwards or downwards until a comfortable position for viewing is reached.



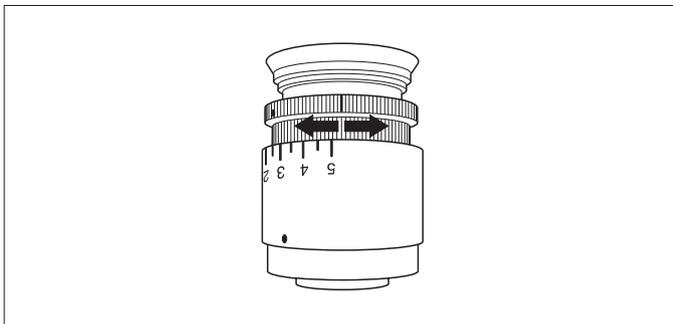
7.5 Adjusting the eyepiece

7.5.1 Determining/adjusting diopter settings for users

The individual diopters can be adjusted continuously for each eyepiece from +5 to –5. The diopters must be set exactly and separately for both eyes. Only this method will ensure that the image will stay in focus within the entire magnification range = parfocal. The surgical microscope ensures a high degree of fatigue resistance when the diopter setting is correct for both eyes.

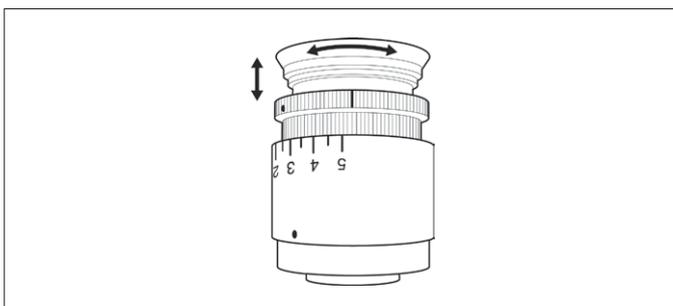
! A parfocally adjusted microscope ensures that assistant's view and monitor image will always remain sharp, regardless of the selected magnification.

- ▶ Select the minimum magnification.
- ▶ Place a flat object with sharp contours on monitor under the lens at working distance.
- ▶ Focus the microscope.
- ▶ Set the maximum magnification.
- ▶ Focus the microscope.
- ▶ Set the minimum magnification.



- ▶ Without looking into the eyepieces, turn both eye lenses to +5 diopters.
- ▶ Slowly turn the eyepieces towards –5 individually for each eye until the test object appears in sharp focus.
- ▶ Select the highest magnification and check the sharpness.

7.5.2 Adjusting the pupillary distance



- ▶ Rotate the eyecups up or down until the desired distance is set.

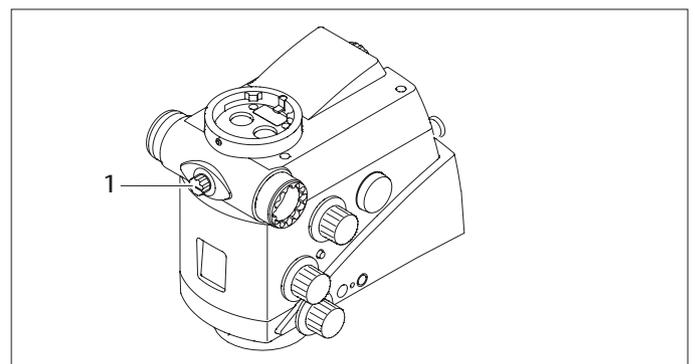
7.5.3 Checking parfocality

- ▶ Place a flat test object with sharp contours under the objective at working distance.
- ▶ Zoom through the whole range, observing the test object.

! The image sharpness must remain constant at all magnifications. If this is not the case, check diopter settings of the eyepieces.

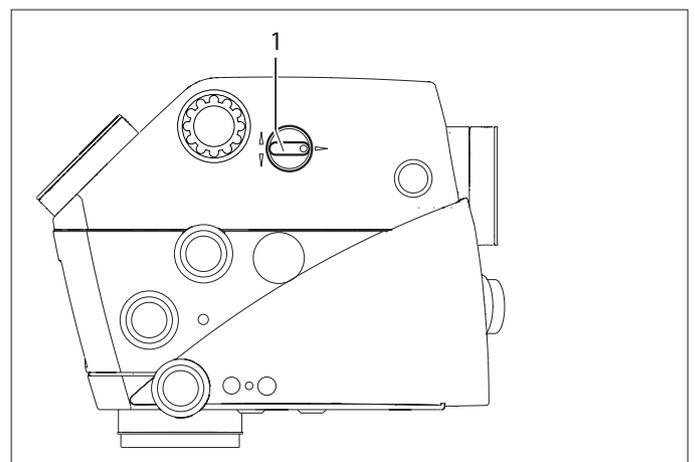
7.6 Selecting the assistant

7.6.1 Leica M530 with IVA530



- ▶ Using knob (1) switch the light for the assistant from left to right or vice versa.

7.6.2 Leica M530 with ULT530 or Leica FL800 ULT



- ▶ Using knob (1) switch the light from the back assistant to the side assistants.

7.7 Positioning on the operating table



WARNING

Risk of injury due to downward movement of the surgical microscope.

- ▶ Complete all preparations and adjustments to the stand before the operation.
- ▶ Never change the accessories or attempt to rebalance the microscope while it is above the field of operation.
- ▶ Before changing accessories, always lock the PROVIDO.
- ▶ Balance the PROVIDO after re-equipping it.
- ▶ Do not release the brakes when the instrument is in an unbalanced state.
- ▶ Before re-equipping during the operation, first swing the microscope away from the operating field.
- ▶ Never carry out the adjustment balancing above the patient.
- ▶ Check fitting and good connection of all parts and cable during the preparation of the system prior to the surgery. Not well fitted parts and bad connections can lead to hazardous situations and system failures.



CAUTION

Risk of damage.

- ▶ Before lifting the microscope make sure that the area above the stand is clear to avoid collisions with OR lamps, ceiling etc.
- ▶ Make sure that the movement range is free before you move the arm with the monitor.
- ▶ Parts of the stand might collide with the ceiling, wall or other equipment in the environment. Make sure that the movement range is free before you move the microscope or stand.
- ▶ Only move the surgical microscope when all brakes are released.

NOTE

Risk of damage to the surgical microscope due to collision.

- ▶ Make sure that there is free space of about 1 m around the foot.

The PROVIDO can be positioned easily on the operating table and offers a variety of possibilities for operations on the head or spinal column.

The PROVIDO achieves this large range of positions through its very long and high arm system.

- ▶ Release the footbrakes (see page 23).
- ▶ Move the PROVIDO carefully over to the operating table by the handle and into the required position for the operation.

Recommendations for positioning the PROVIDO on the OP table

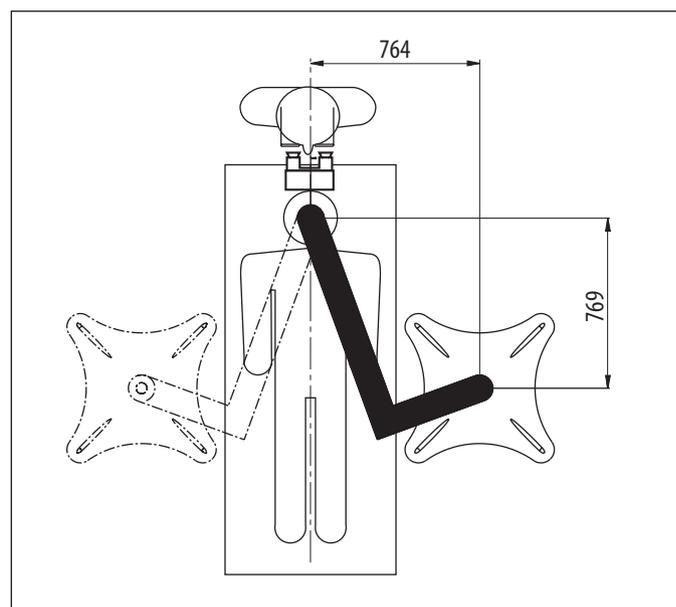


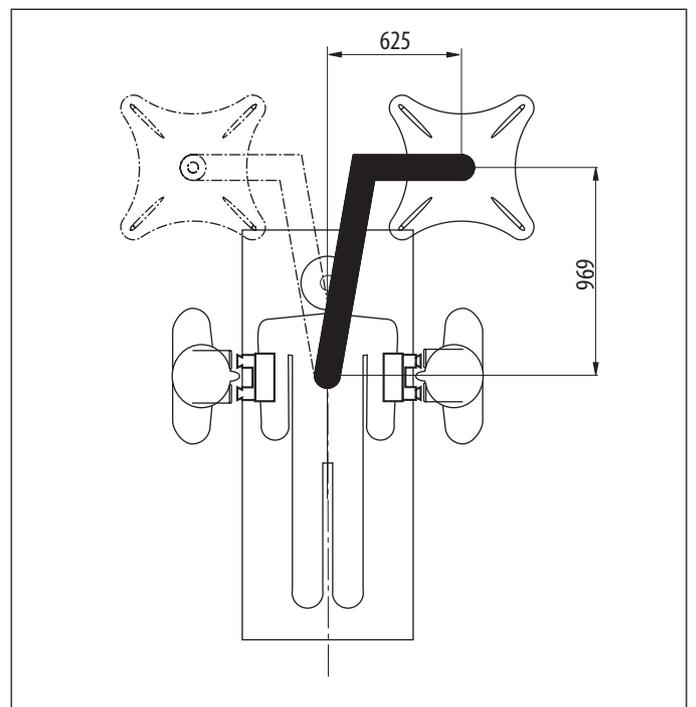
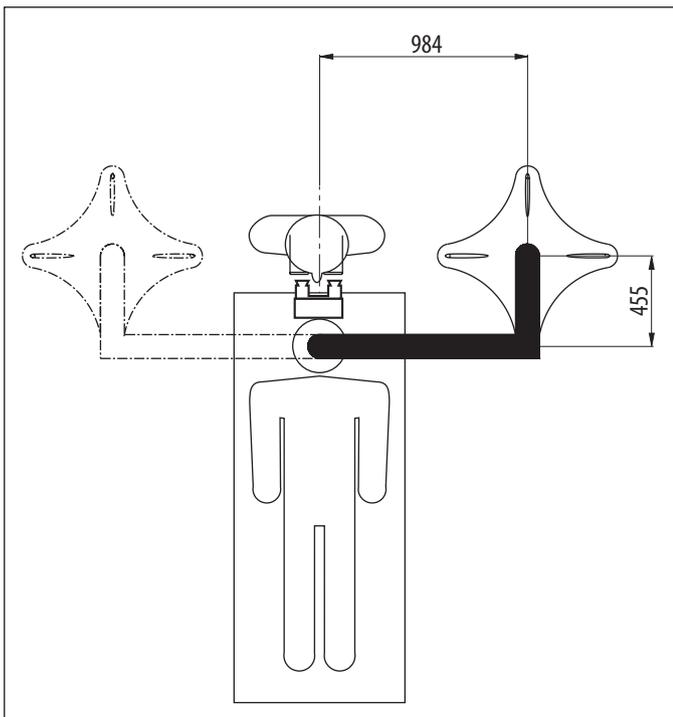
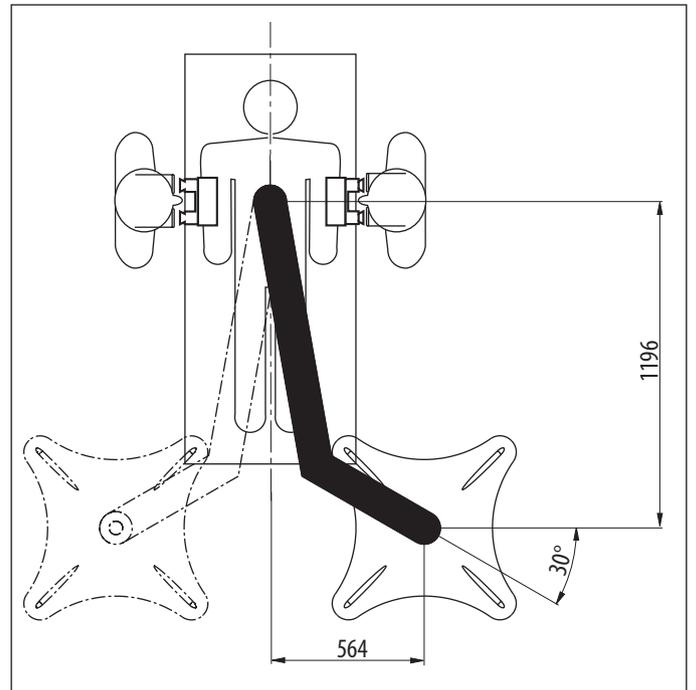
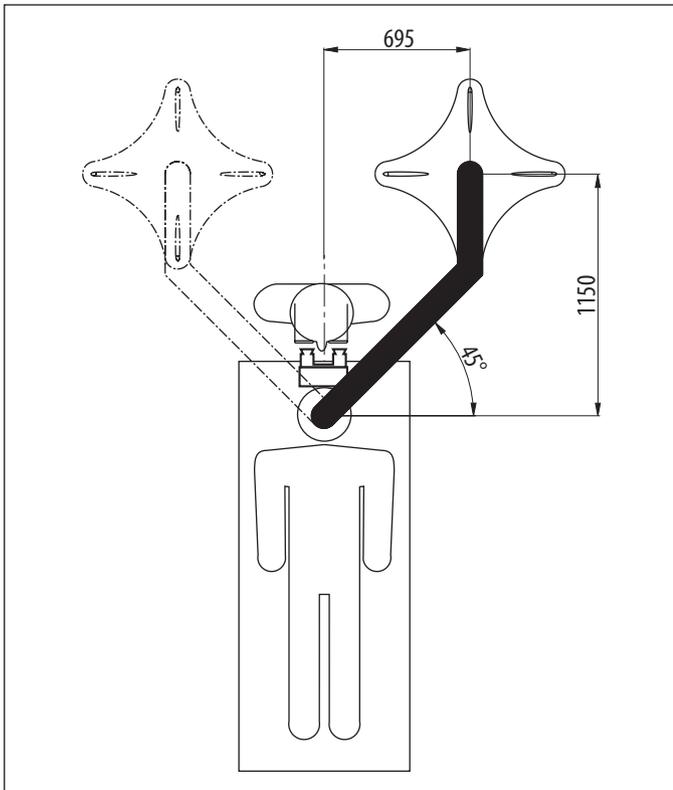
All positions are also possible as the mirror image position.



The instrument must be positioned such that the range of movement is large enough for the expected tasks.

Possible applications for neurosurgery with different working positions for the surgeon (approximate dimensions in mm):





7.8 Attaching sterile controls and drape



WARNING

Risk of infection.

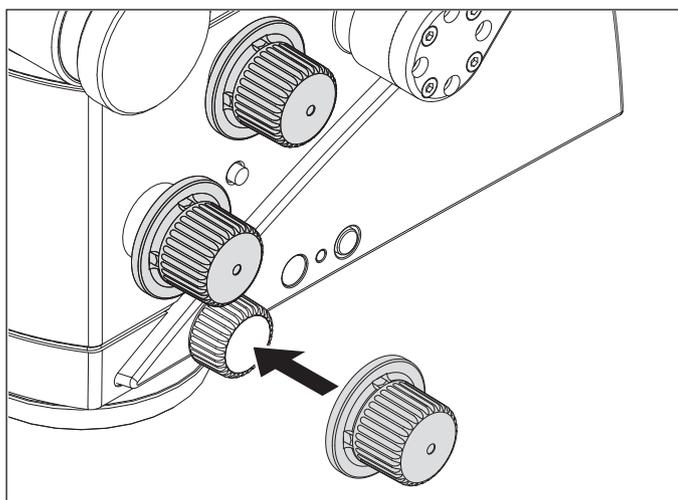
- ▶ Always use the PROVIDO with sterile controls and a sterile drape.

7.8.1 Covers for rotary buttons



Use the covers also when you use sterile disposable drapes. The controls will be easier to grasp.

- ▶ Fit steam-sterilizable covers on the magnification, working distance and Autolris manual override knobs.



- ▶ Attach steam-sterilizable covers to accessories as well (if present).

7.8.2 Sterile drape for stand



- Only use the sterile Leica tested drapes specified in the Accessories section.
- Drape only as far as the arm system (see picture below).



CAUTION

Risk of infection.

- ▶ Leave sufficient space around the stand to ensure that the sterile drape does not come into contact with non-sterile components.
- ▶ Activate the "All Brakes" function on the handle and extend the arm system.
- ▶ Put on sterile gloves.
- ▶ Attach all the sterile controls.

- ▶ Unpack the sterile drape carefully and drape it over the PROVIDO as far as the articulated arm.
- ▶ Clamp the protective glass (optional) onto the objective.
- ▶ Do not attach the sterile drape too tightly with the provided ribbons. It must still be easy to move the instrument.
- ▶ Check the ease of movement of the instrument.



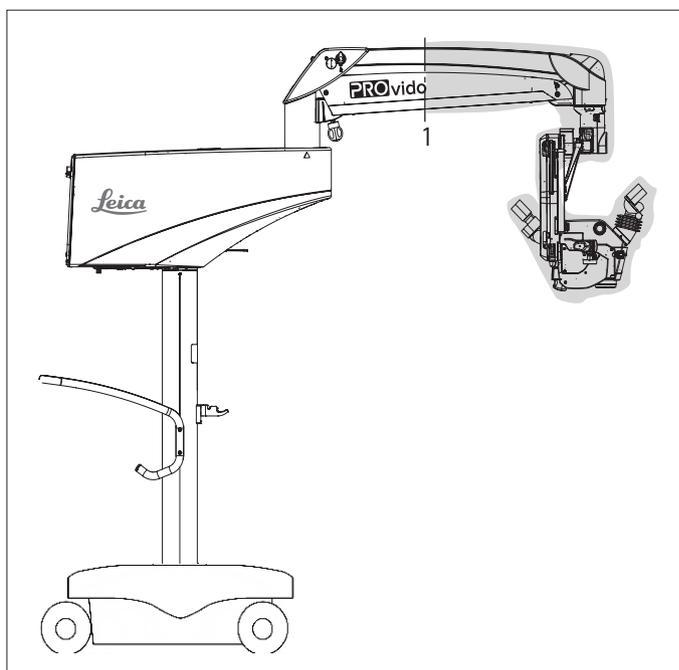
Follow the instructions provided by the manufacturer of the sterile drape.



Always use the drape with a protective glass.



Do not drape further than to position (1).

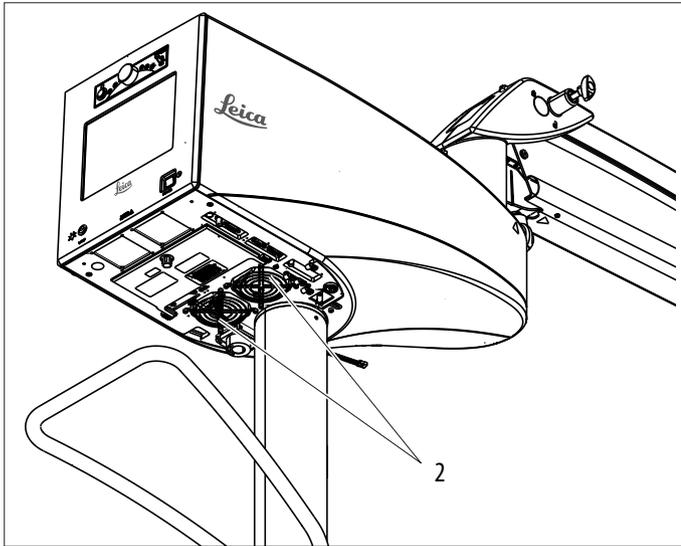


CAUTION

Risk of overheating of the system.

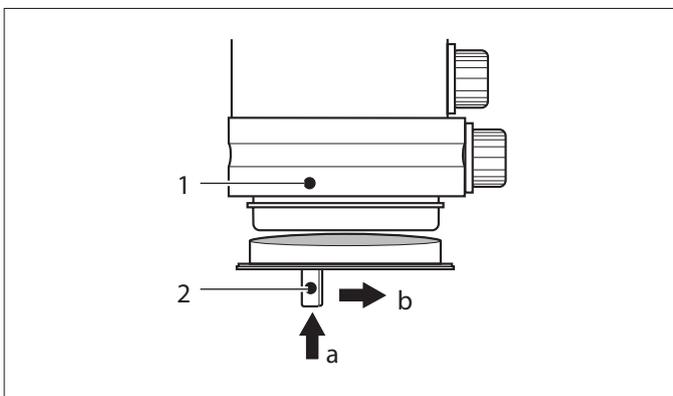
Covering the air inlet (2) can result in a controlled shutdown of the system due to overheating.

- ▶ Make sure the air inlet (2) is always kept free.



7.8.3 Attaching the protective glass to the objective

- ▶ Place the sterilized protective glass on the optics carrier so that the markings on the PROVIDO (1) and on the protective glass (2) are aligned.



- ▶ Insert the protective glass upwards into the bayonet mount in direction (a).
- ▶ Turn the protective glass in direction (b) until it engages.

7.9 Function check

- ! Refer to the checklist before operation on page 74.

8 Operation

8.1 Switching the microscope on



WARNING

Danger of fatal electrical shock.

- ▶ The PROVIDO may be connected to a grounded socket only.
- ▶ Operate the system only with all equipment in its proper position (all covers fitted, doors closed).



WARNING

Danger of eye injury due to possibly hazardous optical infrared and UV radiation.

- ▶ Do not look at the operating lamp.
- ▶ Minimize exposure to eyes or skin.
- ▶ Use appropriate shielding.

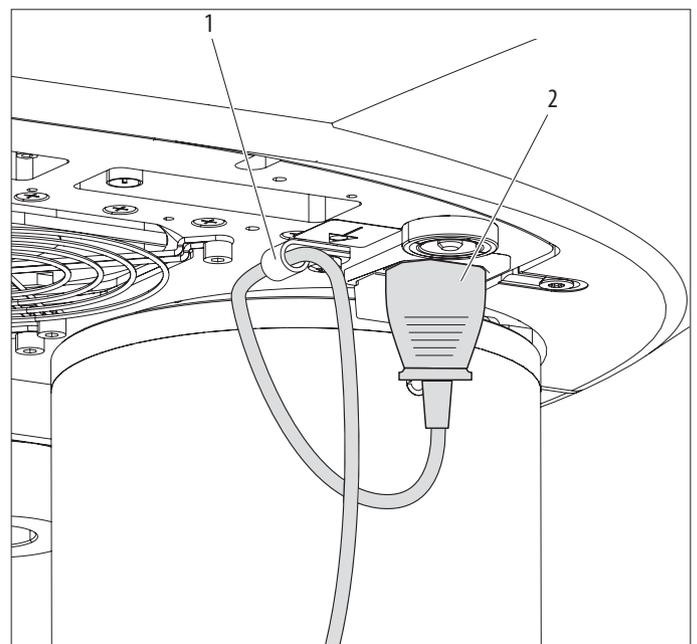


WARNING

Danger of burn injuries in otologic surgery.

- ▶ Use the lowest comfortable light intensity.
- ▶ Adjust the field of view to match the operating field.
- ▶ Irrigate the wound frequently.
- ▶ Cover the exposed parts of the pinna with a moist surgical sponge.

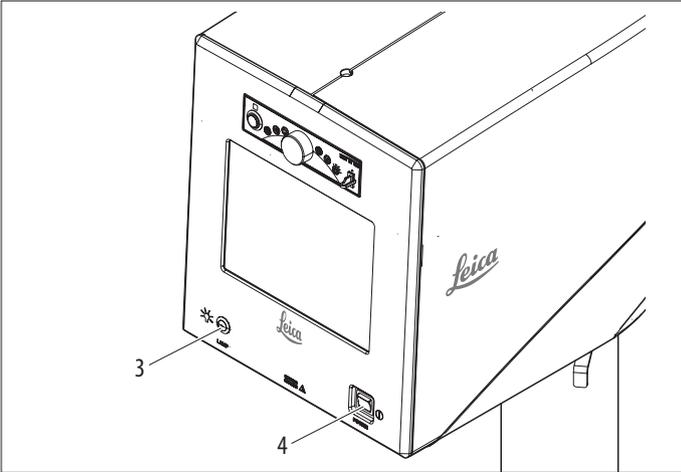
- ▶ Connect the microscope to a grounded socket.
- ▶ Secure power cable (2) at the stand with the power cable clip (1).



- ▶ Switch on the microscope at the power switch (4) on the stand. After the surgical microscope is switched on, a lamp test for both lamps is carried out and the settings of the last active user are loaded.

! If a defective lamp is detected, a warning message is displayed.

- ▶ Check the fiber optics cable connection to the optics carrier.
- ▶ Switch on the illumination with the key (3) on the control unit.



The main screen is displayed.



- ▶ Check both lamp hour counters. To guarantee a good light performance, the life time shall not exceed 500 hours for both Xenon and LED lamps. For a system with FL560 (optional), the life time of lamp 1 shall not exceed 150 hours.

8.2 Positioning the microscope

8.2.1 Coarse positioning

- ▶ Hold the microscope by both handles.
- ▶ Press the button for releasing all brakes and position the microscope.
- ▶ Release the brakes button.

! Also refer to the "Handles" chapter on page 22.

! **CAUTION**
Damage to the PROVIDO due to uncontrolled tilting.
 ▶ Hold the handle when releasing the brake.

8.2.2 Fine positioning (optional)

- ▶ Position the microscope with the XY drive using the joystick on the handle or the joystick on the footswitch.

! You can change the speed at which the XY motors move on the "Speed" menu screen . This value can be saved individually for each user (see page 41).

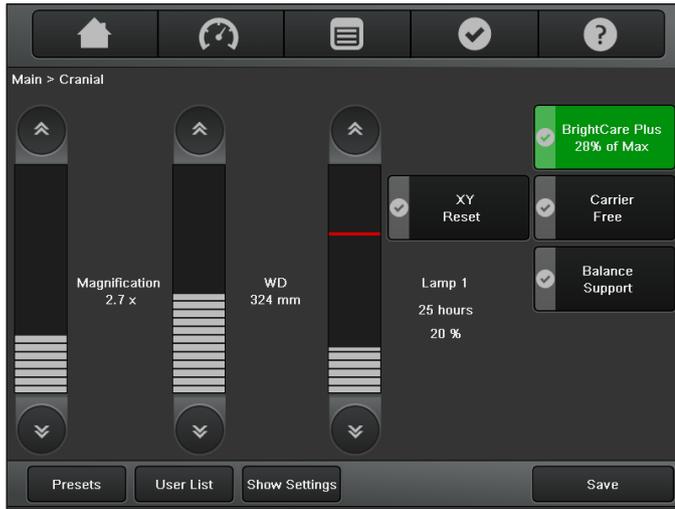


8.3 Adjusting the microscope

8.3.1 Adjusting the brightness

You can make the illumination brighter or darker using either the touch panel monitor, a hand/footswitch, or handle.

On the touch panel monitor in the "Main" menu screen 



- ▶ Press the  or  button on the bar for adjusting the brightness of the illumination "Lamp 1" or "Lamp 2".
- or –
- ▶ Press the brightness adjustment bar directly.
The brightness of the active main illumination changes.

-  • Clicking the  or  button changes the brightness value in increments of 1. Holding down the button with your finger changes the value in increments of 5.
- The start setting can be saved individually for each user (see page 41).
- The main illumination can only be switched on and off using the illumination push-button on the stand.
- The brightness setting is also visible when the illumination is off. However, the display bar will appear darker.

On the footswitch/handle

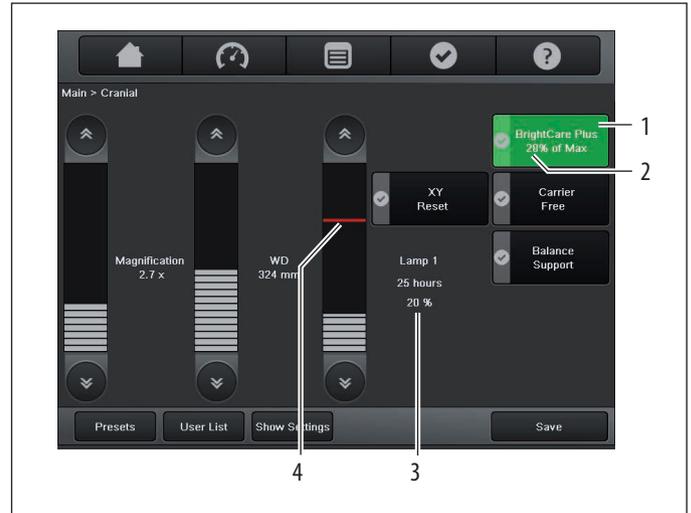
Depending on the assignment (see page 44), you can also increase and decrease the brightness of the main illuminator using two correspondingly assigned buttons on the footswitch/handle.

8.3.2 BrightCare Plus

BrightCare Plus is a safety function which automatically limits the maximum brightness depending on the working distance.

Excessively bright light can, in combination with a short working distance, cause burns in patients.

The BrightCare Plus function is part of the "Main" menu screen 



- 1 BrightCare Plus button
green BrightCare Plus is enabled
yellow BrightCare Plus is switched off
- 2 Configured illumination condition for BrightCare Plus (configured brightness (3)/ max. configurable brightness (4) in %)
- 3 Percent value of the configured brightness
- 4 Red line for maximum configurable brightness with BrightCare Plus

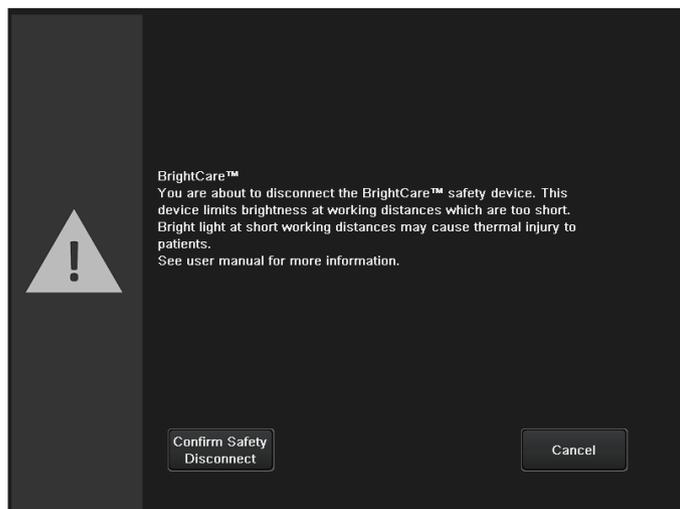
The red line on the brightness adjustment bar shows the maximum adjustable brightness for the current working distance. The brightness cannot be set to a level beyond the red line. When the working distance is reduced by too little at a set brightness, the brightness is reduced automatically.

-  It is advisable to begin with a low light output and increase the light intensity until an optimum level of illumination is achieved.

-  When shipped from the factory, the "BrightCare Plus" safety function is activated for all users

Deactivating BrightCare Plus

- ! Deactivating BrightCare Plus is only possible if this function is enabled in the service menu. If enabled, by clicking the "BrightCare plus" button a dialog window opens in which you have to confirm that you want to deactivate the safety function.



When the "BrightCare plus" safety function is deactivated, the color of the "BrightCare plus" button changes from green to yellow.

- WARNING**
Danger of injury to the eyes.
At a short focal distance, the light source of the illumination unit may possibly be too bright for the operating physician and the patient.
 - ▶ Begin with the lower-intensity light source and slowly increase it until the operating physician has an optimally illuminated image.

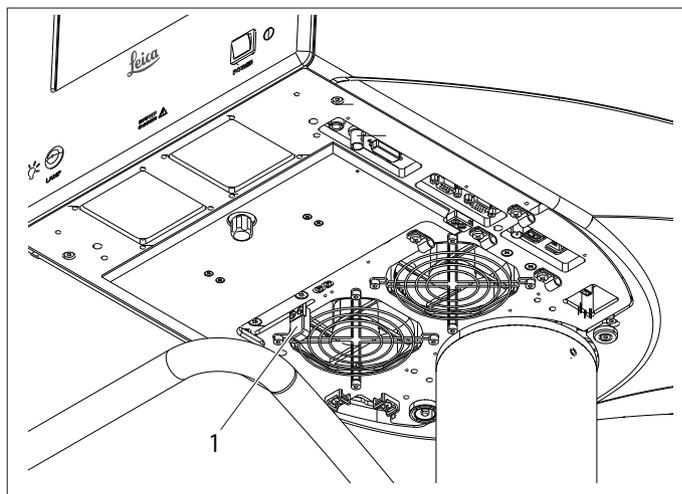
- ! The status of the "BrightCare plus" safety function can only be changed permanently in the "User settings" menu. A change in status during operational procedures will not be stored when the user settings are saved with "Save" or "Save as"!

Reactivating the "BrightCare Plus" safety function

- ▶ Click the yellow "BrightCare plus" button again. "BrightCare plus" is now activated and the button is again lit green.

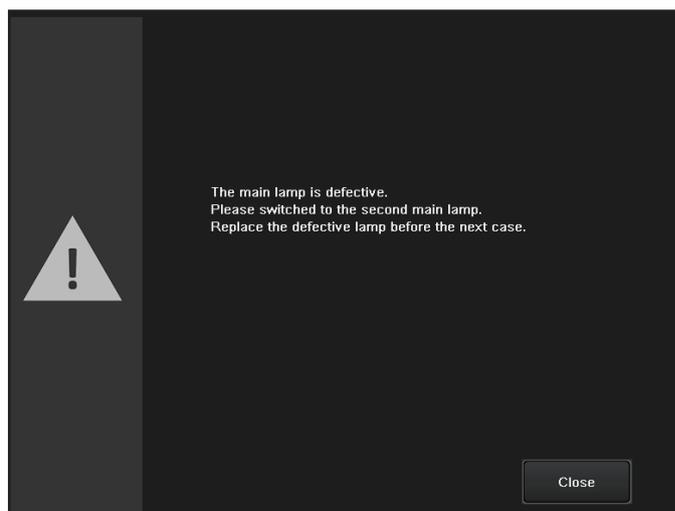
8.3.3 Changing lamps

If the xenon primary illuminator fails, you can use the sliding switch (1) at the bottom of the swing arm to the switch to auxiliary illuminator.



- ! ▶ Replace the defective lamp at the next opportunity.
- ▶ Never begin a surgery with only one functioning xenon lamp. The LED can only be exchanged by a Leica Service person.

- ! A dialog window informs you when the xenon lamp is losing luminosity and is no longer sufficient. We recommend that you keep a replacement lamp handy.



- ▶ Press the "Close" button. The dialog window is closed.
- ▶ Replace the defective lamps, see section 11.4.

8.3.4 Setting the illumination field diameter



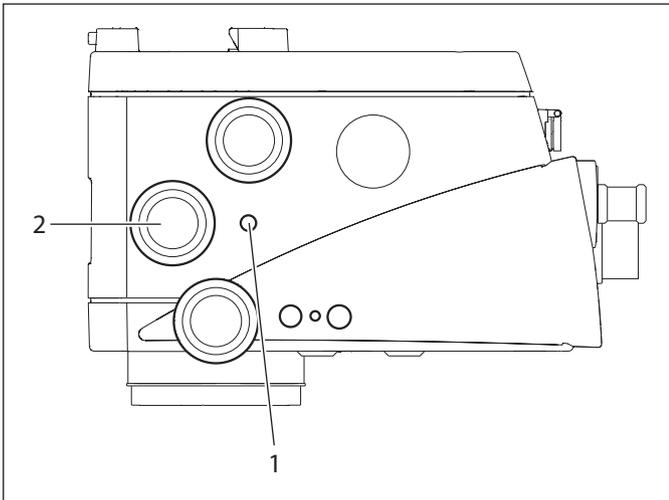
CAUTION

If the field diameter is greater than the field of view and the light intensity is too high, uncontrolled tissue heating may occur outside of the area visible through the microscope.

- ▶ Do not set the light intensity too high.

With Autolris the field diameter is automatically adapted to the size of the field of view at the M530 optics carrier.

- ▶ To adjust the illumination field diameter manually, use rotary button (2).
- Automatic adjustment Autolris is deactivated.
- ▶ To reactivate Autolris press the Reset button (1).



If the illumination field diameter is blocked at a high light intensity in a high magnification setting, and cannot be adjusted automatically or manually, then the light intensity must be reduced in order to protect the tissue.



If the field diameter is locked in a small position and cannot be adjusted either automatically or manually, you can use an OP lamp to better illuminate a large field of view (small magnification position).

8.3.5 Adjusting the magnification (zoom)

You can adjust the magnification using a footswitch/handle or the "Magnification" adjustment bar on the "Main" menu screen  of the control unit.

On the touch panel monitor in the "Main" menu screen:



- ▶ Press the the  or  button on the bar for adjusting the magnification.
- or –
- ▶ Press the magnification adjustment bar directly. The magnification changes.



- Clicking the  or  button changes the magnification value in increments of 1. Holding down the button with your finger changes the value in increments of 5.
- You can adjust the magnification motor speed in the "Speed" menu .
- These values can be saved individually for each user (see page 41).

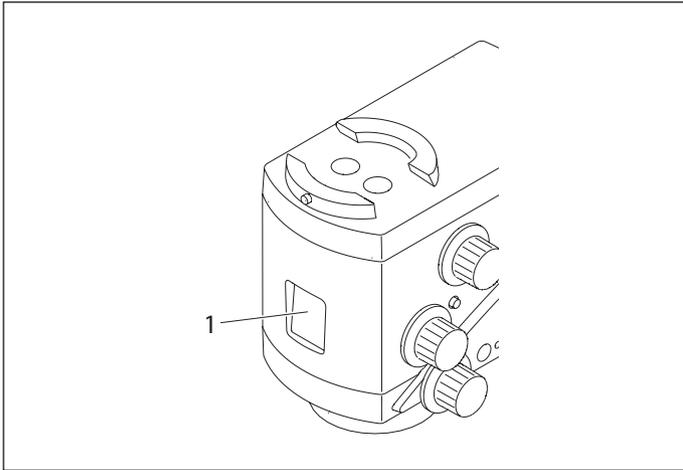


WARNING

Danger to the patient due to failure of the magnification motor.

- ▶ If the magnification motor fails, adjust the magnification manually.

! You can read the currently set magnification on the display (1) on the M530 optics carrier.

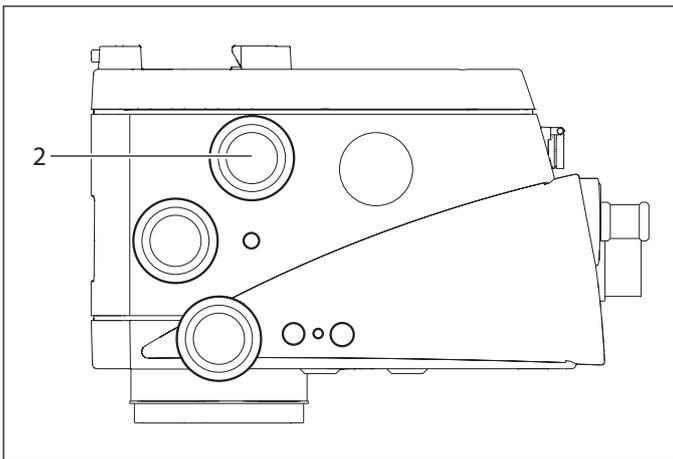


Manually adjusting the magnification (zoom)

! **CAUTION**
Destruction of the magnification motor.
 ▶ Only adjust the magnification manually if the magnification motor is defective.

If the magnification motor fails, the magnification can be manually adjusted using the rotary knob (2).

- ▶ Push in rotary button (2).
- ▶ Set the desired magnification by turning the knob.



8.3.6 Setting the working distance (WD, focus)

! **WARNING**
Danger of serious damage to tissue due to incorrect working distance.
 ▶ When using lasers, always set the working distance of the microscope to laser distance and lock the microscope in position.
 ▶ Do not adjust the rotary button for manual setting of the working distance while using the laser.

! **WARNING**
Danger of injury to the eyes due to laser radiation.
 ▶ Never point the laser directly or indirectly via reflecting surfaces to the eyes.
 ▶ Never point the laser to the eyes of the patient.
 ▶ Do not look into the laser beam.

You can adjust the working distance using the footswitch/handle or the "WD" adjustment bar on the "Main" menu screen  of the control unit.

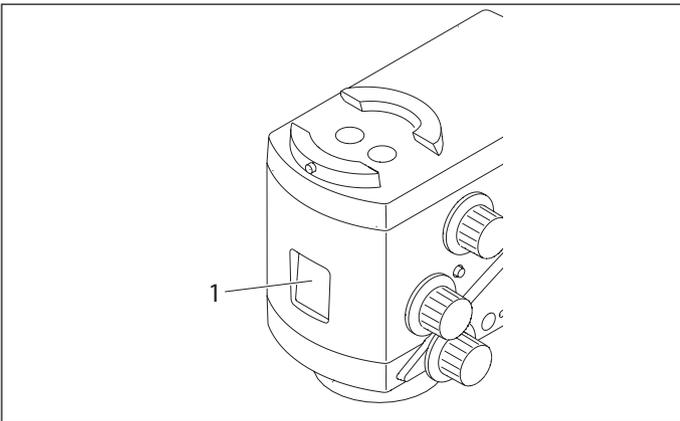
On the touch panel monitor in the "Main" menu screen :



- ▶ Press the  or  button on the bar for adjusting the working distance (WD).
- or –
- ▶ Press the working distance adjustment bar directly. The working distance changes.

- ! Clicking the  or  button changes the working distance in increments of 1. Holding down the button with your finger changes the value in increments of 5.
- You can adjust the working distance motor speed in the "Speed" menu .
- These values can be saved individually for each user (see page 41).
- You can return the working distance motor to the working distance saved for the current user using the "WD Reset" button.

- ! You can save the currently set working distance on the "Main" menu screen  of the control unit or read it off the display (1) on the M530 optics carrier.
- You can read the currently set working distance off the display (1) on the M530 optics carrier.



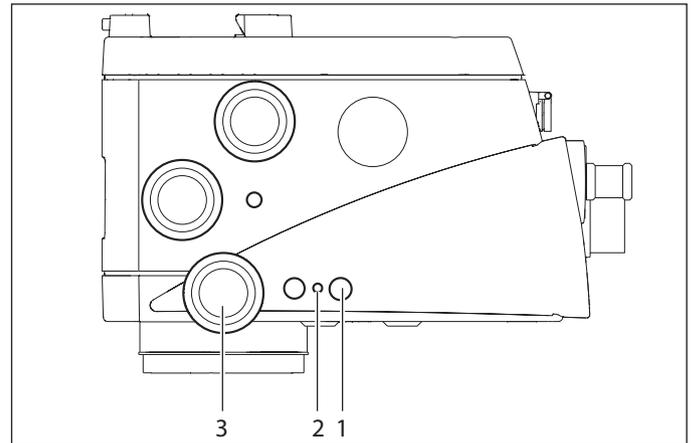
- ! WARNING**
Danger to the patient due to failure of the working distance motor.
- ▶ If the working distance motor fails, adjust the working distance manually.

Setting the working distance manually

- ! WARNING**
Danger of serious damage to tissue due to incorrect working distance.
- ▶ When using lasers, always set the working distance of the microscope to laser distance and lock the microscope in position.
 - ▶ Do not adjust the rotary button for manual setting of the working distance while using the laser.

- ! CAUTION**
Destruction of the working distance motor.
- ▶ Only adjust the working distance manually if the working distance motor is defective.

If the working distance motor fails, the working distance can be manually adjusted using the rotary knob (3).



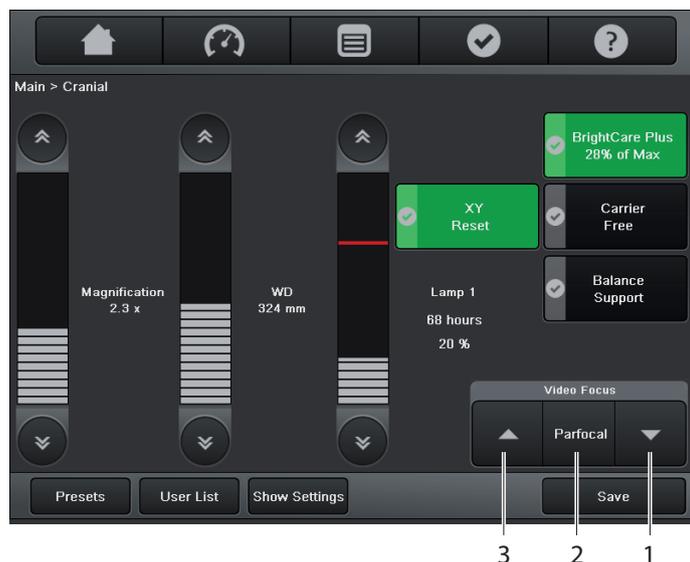
- ▶ Turn rotary button (3) and set the working distance as required.

Locking/releasing the working distance

- ! It is necessary to lock the working distance when working at a fixed distance or when using a laser.**
- ▶ Press key (1).
 The yellow LED (2) turns on and the working distance is locked.
 - ▶ Press key (1) again.
 The yellow LED (2) turns off and the working distance is released.

8.3.7 Adjusting the video fine focus (optional)

The Leica FL800 ULT and ULT530 offer fine focusing and parfocality reset of the video focus.



- ▶ The video focus can be adapted to your needs by pressing the focus button up (3) or/and down (1). This command can be given to the GUI and from the handle, if defined.

! Focus adjustment operates in both directions with an endless circular movement.

The video fine focus can be re-adjusted to parfocality position by pressing the parfocality button (2). The video focal plane will then be aligned for all observers with zero diopters respectively with correct individual diopter settings. This command can be as well given on the GUI and from the handle, if defined.

8.4 Transportation

! WARNING

Danger of injury due to:

- **uncontrolled lateral movement of the parallelogram**
- **tilting of the stand**
- **feet in lightweight shoes could become trapped beneath the casing of the base**
- ▶ For transportation, always move the PROVIDO into the transport position.
- ▶ Never move the stand while the unit is extended.
- ▶ Never roll over cables lying on the floor.
- ▶ Always push the PROVIDO at the handrail and never pull it.
- ▶ Make sure that the movement range is free.



CAUTION

Surgical microscope can move without warning!

- ▶ Always lock the footbrake when you are not moving the system.



CAUTION

Damage to the PROVIDO due to uncontrolled tilting!

- ▶ Hold the handle when releasing the brake.



CAUTION

Damage to the PROVIDO during transportation!

- ▶ Never move the stand in the extended condition.
- ▶ Never roll over cables lying on the floor.
- ▶ Do not transport or store the system in areas with an elevation angle bigger than 10°.



CAUTION

Damage to the housing of the stand or to the touch panel of the control unit!

- If the optics carrier is moved into the transport position or from the transport position to the operating position:
- ▶ Ensure that the transport lock must be locked.

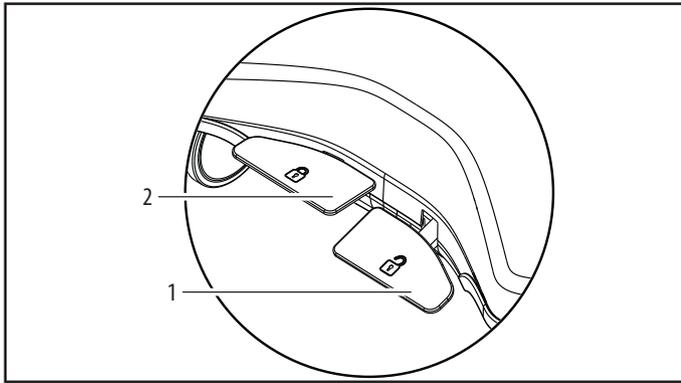


CAUTION

Damage to other medical equipment or injury to personnel.

- ▶ Take care of monitor movement when rotating the tower. The monitor will move together with the tower and can collide with other medical equipment or personnel.

- ▶ Ensure that the PROVIDO is in the transport position (see section 7.1).



- ▶ Press the footbrake pedal on the right (1) to unlock the castor wheels lock.
- ▶ Move the microscope using the handle.
- ▶ Press the footbrake pedal on the left (2) to lock the castor wheels lock.

8.5 Shutting down the surgical microscope

- ▶ If present, turn off the recording system according to the manufacturer's instructions.
- ▶ Switch off the light at the light switch.
- ▶ Bring the surgical microscope into the transport position.
- ▶ Switch off the surgical microscope at the power switch.

9 Control unit with touch panel

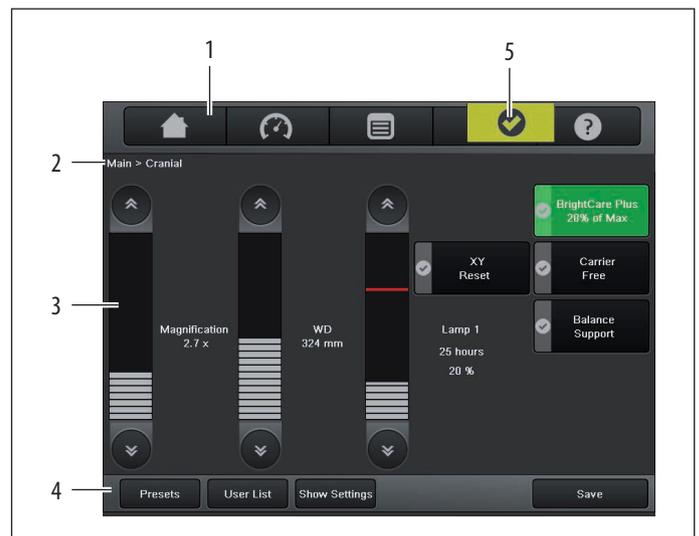


CAUTION

Damage to the touch panel.

- ▶ Operate the touch panel using your fingers only. Never use hard, sharp or pointed objects made out of wood, metal or plastic.
- ▶ Never clean the touch panel using cleaners that contain abrasive substances. These substances can scratch the surface and cause it to become dull.

9.1 Menu structure



- 1 Quick access to the screens "Main" , "Speed" , "Menu"  and "Help" 
- 2 Status line
- 3 Display range
- 4 Dynamic button bar
- 5 Warning messages 



In operational mode, the status line displays the current user and specifies the current location in the menu at all times.

9.2 Selecting users

In the "Main"  and "Speed"  menu screens, the three buttons "Presets", "User List" and "Show Parameters" appear in the dynamic button bar at all times.



9.2.1 Presets

You can find a list of default users preset by Leica for the most common types of operation under "Presets".



- ▶ Click one of the default users, then click "Select".
The PROVIDO is ready to operate straight away.



- You can adapt and save the settings of these default users as required (see page 41).
- You can click the "Show Settings" button at any time to see an overview of the user settings of the current user.

9.2.2 User list

The "User List" opens a two-page user list from which you can select one of up to thirty users that can be saved.

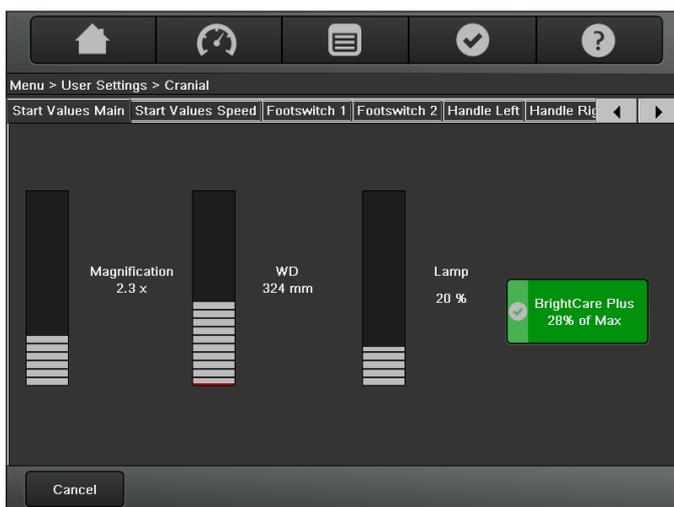


- ▶ Click the "1-15" or "16-30" button to switch between screens.
- ▶ Select a user.
The "Select" button is shown.
- ▶ Click "Select".
The user settings are loaded.

- ! • When the user list is open, it can be edited at any time.
- Before each operation, make sure that your desired user is selected and familiarize yourself with the assignment of the handles and the optional footswitch (if used).

9.2.3 Show Settings

- ▶ Press the "Show Settings" button in the dynamic button bar to see an overview of the user settings of the current user.



9.3 Menu – User Settings

You can configure user settings in this menu.

- ▶ Click the "Menu" button and select "USER SETTINGS".



The following screen is displayed:



- "Load" Loads the settings of an existing user from the user list for modifying.
- "New User" Opens a new user with "blank" settings.
- "New (Preset)" Opens the "Preset" screen for selecting a default user in order to create a new user with the settings of the desired preset and to load or modify the user's settings.
- "Edit User List" Allows to rename, to move or to delete users.

- You can also add a user from the operational menu.
- If you want to keep the current settings, you can save them by clicking the "Save" button (which appears as soon as the basic settings of the current users have been changed), either for the current user ("Save") or under a new username ("Save as New").

Editing the user list

Various functions are available in the user list depending on the situation.



- ▶ Select the user.
The available functions are displayed in the dynamic button line:

"Move"	Moves the selected user to another available location of your choosing.
"Delete"	Deletes the selected user.
"Rename"	Renames an existing user. The user's settings are not changed.
"Confirm"	Confirms the previous action.
"Change password"	Changes the password.



CAUTION

Danger to the patient due to changes in the user settings.

- ▶ Never change the configuration settings or edit the user list during an operation.
- ▶ Check fitting and good connection of all parts and cables during the preparation of the system prior to the surgery. Not well fitted parts and bad connections can lead to hazardous situations and system failures.

9.3.1 User Setting Protection

To avoid unauthorized or accidental changes of user settings, each user setting can be protected by a password/PIN. This keeps the working parameters identical each time you load a protected user setting. Changes can be done during the application, but will not be stored unless "Save as Current" or "Saved as new" with entering the correct password/PIN.

Saving and protecting the user settings is done in two ways:

As a current user setting

You will receive a prompt for the password/PIN.

- ▶ If a password/PIN was defined save the changes of the user settings with entering the correct password/PIN.

If it is incorrect the system will go back to "Start values main".

- ▶ Choose "Save as current" and enter the password/PIN again. If no password/PIN was defined, you can define a password/PIN (4-10 characters).

- ▶ Press "OK" for re-entering and confirmation.

If the re-entered password/PIN does not match the enter/re-enter process has to be repeated.

If no password/PIN should be defined, you can exit the procedure by pressing "Skip" or before re-entering with "Cancel".

As a new user setting

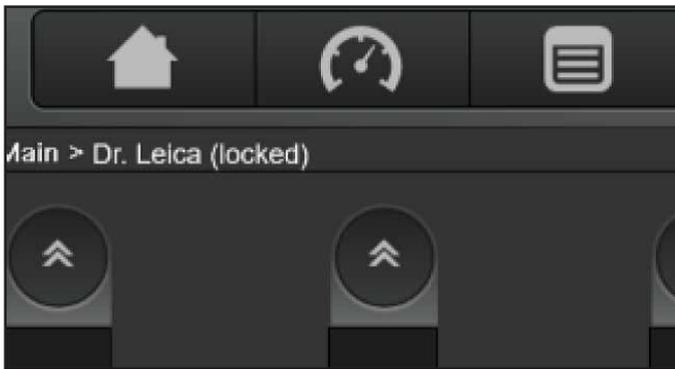
You will receive a screen message and a prompt for the password/PIN after entering the name of the user setting. If the settings should be protected:

- ▶ Enter a password/PIN (4-10 characters) and press "OK" for re-entering and confirmation.

If no password/PIN should be defined you can exit the procedure by pressing "Skip" or before re-entering with "Cancel".

If the re-entered password/PIN does not match the enter/re-enter process has to be repeated.

The protection of a user setting by a password/PIN is indicated by "(locked)" right after the user setting name on the GUI main page or by a lock icon in front of the user setting name in the Select User page.



Changing password



- ▶ Select a user and click the "Change Password" button.
- ▶ Follow the instructions on the screen.

9.3.2 Setting the "Main" start values

For the selected user you can set the start values for the illuminator, working distance and magnification on this screen.



- ▶ Clicking the  or  button changes the values in increments of one. Holding down the button with your finger changes the value in increments of five.
- ▶ You can also set the desired value by directly clicking the bars.

Brightcare Plus

- ▶ Set the status of the BrightCare Plus safety function for the selected user.

9.3.3 Setting the "Speed" start values

For the selected user you can set the start values for the travel speed of the magnification, working distance and XY motors on this screen.



- ▶ Clicking the or button changes the values in increments of one. Holding down the button with your finger changes the value in increments of five.
- ▶ You can also set the desired value by directly clicking the bars.

Intelligent Focus Speed

- ▶ If "Intelligent Focus Speed" is activated, the focus speed automatically adapts to the current magnification.

High magnification	low speed
Low magnification	high speed

Intelligent XY Speed Linked to Zoom

- ▶ If "Intelligent XY Speed Linked to Zoom" is activated, the xy speed depends on the current magnification.

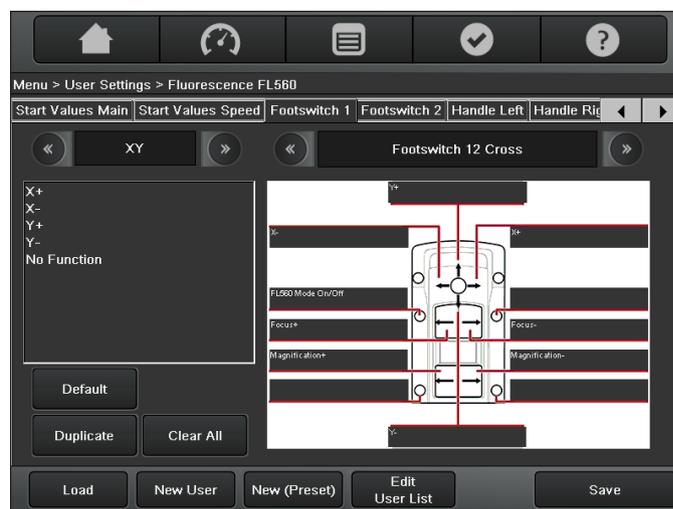
High magnification	low speed
Low magnification	high speed

WD Reset

- ▶ Set the default settings for WD-Reset. If "WD Reset" is activated, the working distance motor automatically moves to the working distance saved for each user in the user settings when "All Brakes" are released. This function is deactivated in the factory default configuration.
- ▶ Clicking the "WD Reset" button activates/deactivates the "WD Reset" function and the color of the button changes to green (activated) / gray (deactivated).

9.3.4 Footswitch assignment (Footswitch 1 and Footswitch 2)

Here, you can configure individual settings for each user for your optional footswitch.



- ! The "Footswitch 1" tab allows for configuration of the internally pre-installed footswitch. The "Footswitch 2" tab allows for configuration of the footswitch paired with the externally connected receiver - see section 6.3 "Terminals".

- ▶ First select a Footswitch.
- ▶ In the right selection field, select the footswitch you are using.
- ▶ You can scroll forwards or backwards in the list by clicking the arrowheads.
- ▶ Click the "Default" button. The default settings are assigned to the selected footswitch.
- ▶ You can then modify these settings as you like. Clicking the "Clear All" button clears the assignments for all keys.

Configuring individual keys

- ▶ In the right selection field, select the footswitch you are using.
- ▶ You can scroll forwards or backwards in the list by clicking the arrowheads.
- ▶ In the left selection field, select the function group with the desired functions.
- ▶ You can scroll forwards or backwards in the list by clicking the arrowheads.
- ▶ Select the desired function.
- ▶ Click the caption of the desired key to assign the selected function to it.

Overview of function groups

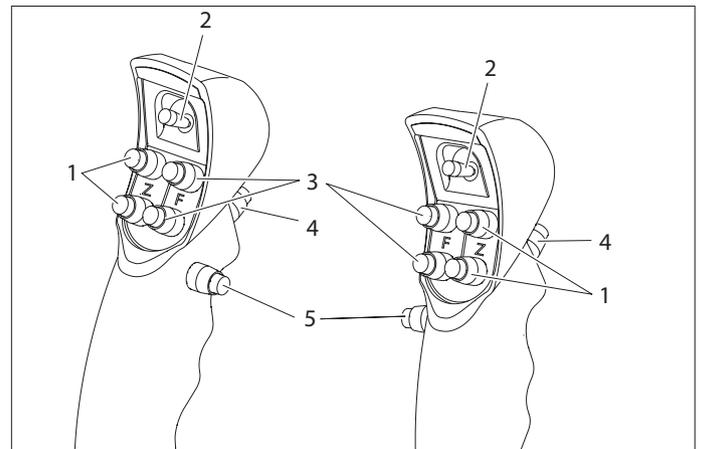
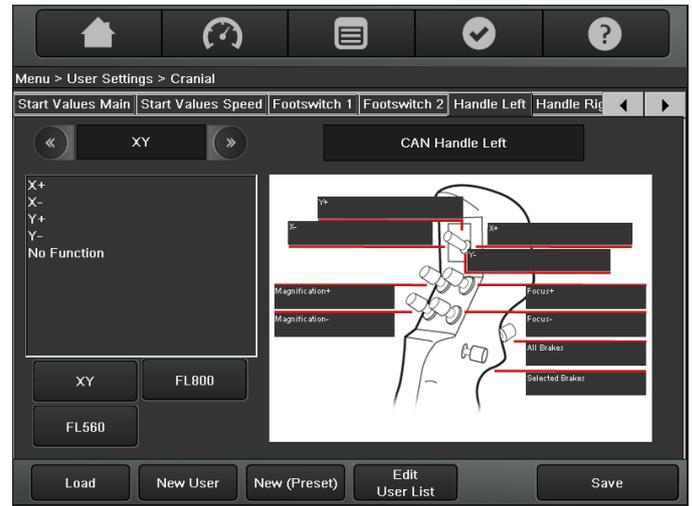
The possible configuration is divided into the following function groups:

- Drive
- Extra
- Light
- XY (optional)
- Fluorescence (optional)

- ▶ You can change the status of a function with the "Toggle" function (e.g. on/off). The "Pulse" function continuously changes a status (such as increasing the brightness).
- ▶ To delete an assignment which you do not want, select the "No Function" element - which can be found in all function groups - and assign it to the key in question.
- ▶ If you are creating only one footswitch configuration for one user, we recommend duplicating it to the second footswitch input by pressing the "Duplicate" button. This ensures that your footswitch functions the way you want it to, regardless of which input it is plugged into.

9.3.5 Handle assignment (Handle Left / Handle Right)

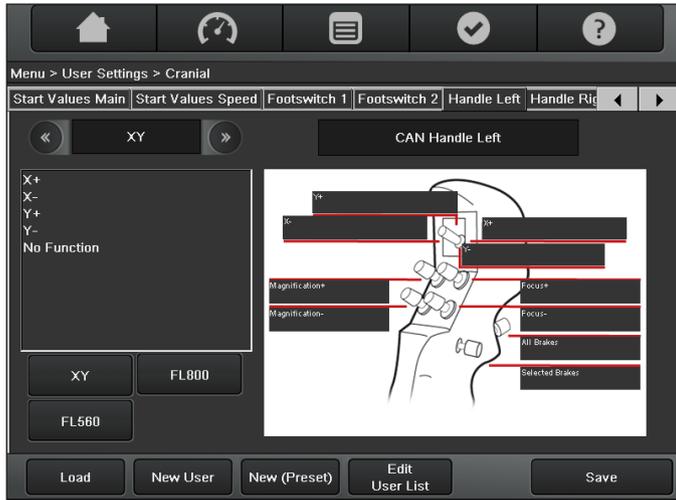
On the two handle assignment screens, you can assign up to nine functions of your choice to the left and right handles.



! The "All Brakes" function is always assigned to the rear switch (4) for both handles, and can neither be overwritten nor deleted.

- ▶ In the left selection field, select the function group with the desired functions.
- ▶ You can scroll forwards or backwards in the list by clicking the arrowheads.
- ▶ Select the desired function.
- ▶ Click a free caption of the desired key to assign the selected function to it.
- ▶ The inner switch (2) to which "Selected Brakes" is pre-assigned can be freely assigned, as required.
- ▶ You can also assign one of the three defaults "X/Y", "FL800" or "FL560" completely to each handle.

Default handle assignments XY



Default timeout is 5 seconds.

0 seconds means that the function is switched off immediately.

9.3.7 Leica FL560 for M530 / Leica FL800 ULT settings

The FL560 / FL800 settings are described in the corresponding user manual.



- For the FL560, only lamp 1 shall be used.
- For optimum performance, we recommend a life time of 150 hours.

9.3.8 AutoFocus Settings

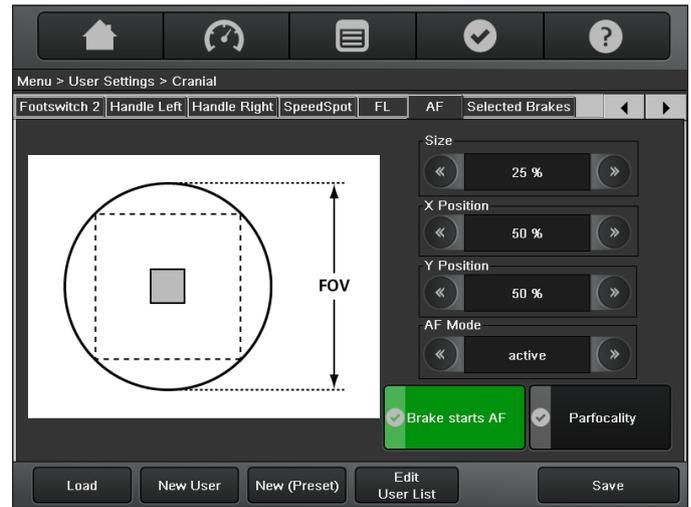


- AutoFocus is an optional function and can be ordered additionally.
- AutoFocus does not work during FL800 mode.

9.3.6 Leica SpeedSpot settings



Leica SpeedSpot does not work during FL800 mode.



The small grey field in the middle represents the AutoFocus window.

Size

- ▶ Adjust the size of the AutoFocus window
- Possible settings: 10 % to 100 %
- Default setting: 25 %

X Position / Y Position (optional)

- ▶ Adjust the X and Y position of the AutoFocus window
- Possible settings: 5 % to 100 %
- Default setting: 50 % each, so the AutoFocus window is exactly in the middle

AF Mode (optional)

- ▶ Select from the following:
- Active, Not active

SpeedSpot Function

- ▶ Select from the following:
- Active, Not active

SpeedSpot Trigger

Leica SpeedSpot can automatically be switched on and off depending on the following conditions:

- Focus Movement of working distance motor
- Brakes Brakes released
- XY (optional) Movement of XY motors

SpeedSpot Delay

For switching off Leica SpeedSpot, a timeout can be configured from 0 to 10 seconds.

Brake starts AF

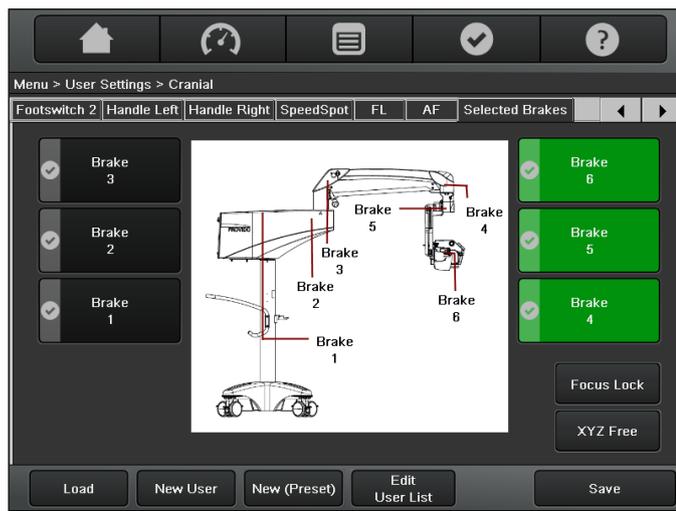
When activated, releasing the brakes starts the AutoFocus function.

Parfocality

- When activated, the objective is automatically brought into working distance at maximum magnification.
- When deactivated, the objective is automatically brought into working distance at the current magnification settings.

! AutoFocus functions can be operated via footswitch/handle. AutoFocus settings are part of the function group "Extra", see page 44.

9.3.9 Selected Brakes



- ▶ Use the "Toggle" buttons to activate/deactivate the selected brake.
- or –
- ▶ Activate the desired brake combination "Focus Lock" or "XYZ Free" on the touch panel monitor by clicking the relevant button.

The button for the preselected brake combination lights up green.



CAUTION

Risk of damage.

- ▶ Only move the surgical microscope when all brakes are released.

9.3.10 Saving user settings

- ▶ Click the "Save" button.
- ▶ Select an available location in the user list at which you want to store your user.



If you like, you can edit the user list first.



- ▶ Enter the desired username using the keyboard.



- ▶ Click the "Save" button to save the user at the desired location under the name you have entered.

9.4 Menu – Maintenance menu

- ▶ Press the Menu button and select "Maintenance".

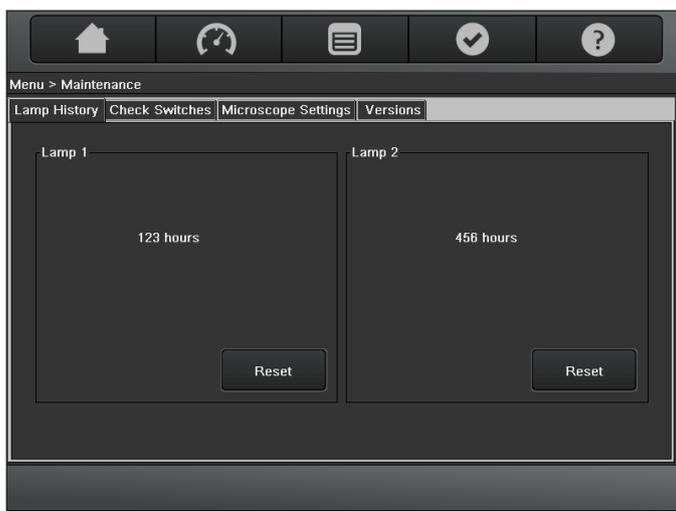


The Maintenance menu offers the following screens:

- Lamp History
- Check Switches
- Microscope Settings
- Versions

9.4.1 Maintenance –> Lamp History

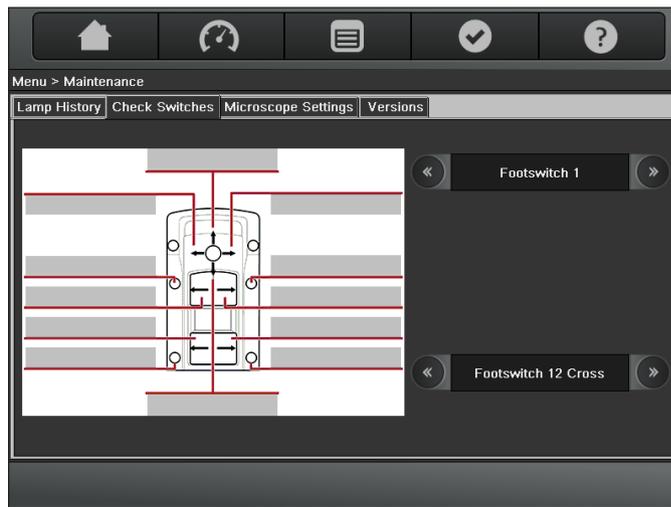
On this screen, you can view and reset the operating hours of lamp 1 and lamp 2.



- ! Whenever you replace a bulb, reset the bulb's hour meter to 0 by double-clicking the "Reset" button. A dialog window informs you when the xenon lamp is losing luminosity and is no longer sufficient.

9.4.2 Maintenance –> Check Switches

On this screen, you can test your handles and the optional footswitch.



Top right selection field

In this field you can select the connection you are using or the desired handle.

- ▶ Scroll forwards or backwards in the list by clicking the arrowheads to select the connection.

Bottom right selection field

In this field you can select the footswitch you want to check.

- ▶ Scroll forwards or backwards in the list by clicking the arrowheads to select the footswitch.
- ▶ Press all of the keys, one after the other, of the footswitch or handle you want to test.

If the key you have pressed is functioning properly, a green dot appears on it on the display. The comment "Tested" appears in the caption field of the key.

9.4.3 Maintenance -> Microscope Settings

On this screen you can configure the accessories you are using. This ensures that the correct magnification is shown on the "Main" menu screen .



Select Surgeon Tube

In this field you can enter the binocular tube currently being used by the surgeon.

- ▶ Scroll forwards or backwards in the list by clicking the arrowheads.

Select Eyepiece

In this field you can select the magnification of the eyepieces being used by the surgeon.

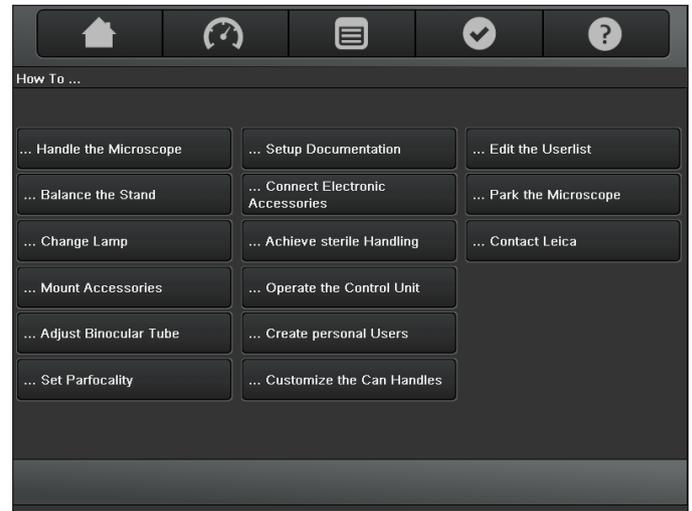
- ▶ Scroll forwards or backwards in the list by clicking the arrowheads.

 If you do not make a selection, the magnification is calculated for the standard equipment: binocular tube 30°–150° and eyepiece with 10× magnification.

9.5 Menu – "How to..."



This screen displays, in short form, user instructions for operating your surgical microscope.



- ▶ Press the button for the topic desired. Detailed information "How to ..." is displayed.

 The "Help"  button in the static menu bar provides access to the "How To..." screens at all times.

9.6 Menu – "Service"

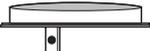
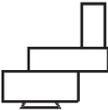
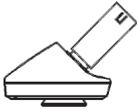
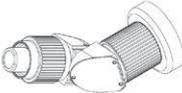
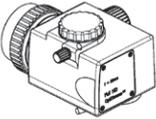
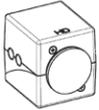


This area is password-protected.

 Before starting the service menu, end the recording procedure on the documentation system. Otherwise data could be lost.

10 Accessories and options

A comprehensive range of accessories enables the PROVIDO to be matched to the requirements of the task in hand. Your Leica representative will be pleased to help you select the appropriate accessories.

Picture	Devices and accessories
	Protective glass
	Binocular tube var. 0° - 180°, T, Type II
	Binocular tube var. 30° - 150°, T, Type II L
	Inclined binocular tube, T, Type II
	Straight binocular tube, T, Type II
	Inclined binocular tube 45°, Type II
	Eyepiece 10×
	Eyepiece 12.5×
	Eyepiece 8.3×
	Magnification multiplier
	Stereo attachment second observer
	Video Adapter (RVA, MVA)
	Leica HD C100, for IVA530

Footswitches

- Leica Wireless Footswitch, 14 functions, type B
- Leica Wireless Footswitch, 12 functions, type B

Recording Systems

- Evolution 4K500

Camera Systems

- Leica Camera System HD C100

Monitors

- FSN 24" Monitor
- FSN 27" Monitor

Other Accessories

- Leica AutoFocus
- Leica FL800 ULT
- Leica FL560
- XY coupling
- Lumenis AcuSpot 712L Laser Manipulator and Digital AcuBlade (optional)

! The maneuverability will be reduced when using the laser accessories.

Drapes

Supplier	Article No.	Main Front	Back assistant	Assistant left	Assistant right
Mikrotek	8033650EU				
	8033651EU	✓	✓	✓	✓
	8033652EU				
	8033654EU				
Phar-maSept	9228H	✓	–	✓	✓
	9420H				
Fuji System	0823155	✓	–	✓	✓
	0823154	✓	✓	–	✓
Spiggle & Theis	2500130H	✓	–	✓	✓
Advance Medical	09-GL800	✓	–	✓	✓

! The use of the Leica Protective glass 10446058 is recommended (to prevent reflections and holograms).

! For further information refer to the corresponding user manual.

11 Care and maintenance

11.1 Maintenance instructions

- Put a dust cover over the instrument while the breaks are in work.
- Keep accessories in a dust-free place when not in use.
- Remove dust with a pneumatic rubber pump and a soft brush.
- Clean the objectives and eyepieces with special optics cleaning cloths and pure alcohol.
- Protect the surgical microscope from damp, vapors, acids, alkalis, and corrosive substances.
Do not keep chemicals near the instrument.
- Protect the surgical microscope from improper handling.
Install other device sockets or unscrew optical systems and mechanical parts only when explicitly instructed to do so in this user manual.
- Protect the surgical microscope from oil and grease.
Never oil or grease the guide surfaces or mechanical parts.
- Remove coarse debris with a moistened disposable cloth.
- To disinfect the surgical microscope, use compounds from the surface disinfectant group based on the following active ingredients:
 - aldehydes,
 - alcohols,
 - quaternary ammonium compounds.

 Due to potential damage to the materials, never use products based on

- halogen-splitting compounds,
 - strong organic acids,
 - oxygen-splitting compounds.
- ▶ Follow the disinfectant manufacturer's instructions.

 It is recommended to conclude a service contract with Leica Service.

11.2 Cleaning the touch panel

- ▶ Before cleaning the touch panel, switch off your PROVIDO and disconnect it from the power supply.
- ▶ Use a soft, lint-free cloth to clean the touch panel.
- ▶ Do not apply cleaning agent directly to the touch panel; rather, apply it to the cleaning cloth.
- ▶ Use a commercially available glass/eyeglass cleaner or plastic cleaner to clean the touch panel.
- ▶ Do not apply pressure to the touch panel while cleaning it.

 It is recommended to conclude a service contract with Leica Service.

CAUTION

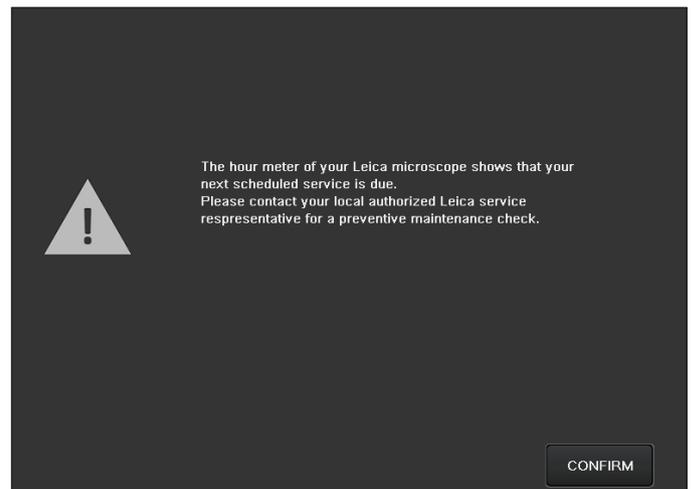
Damage to the touch panel.

- ▶ Operate the touch panel using your fingers only.
Never use hard, sharp or pointed objects made out of wood, metal or plastic.
- ▶ Never clean the touch panel using cleaners that contain abrasive substances. These substances can scratch the surface and cause it to become dull.

11.3 Maintenance

The PROVIDO generally requires no maintenance. To ensure that it always operates safely and reliably, we recommend that you take the precaution of contacting the responsible service organization. You can arrange for periodic inspections or, if appropriate, conclude a maintenance contract with them.

-  • It is recommended to conclude a service contract with Leica Service.
- Use only original spare parts for servicing.
- After 18 months you will be reminded that the inspection is due when you switch on the microscope.



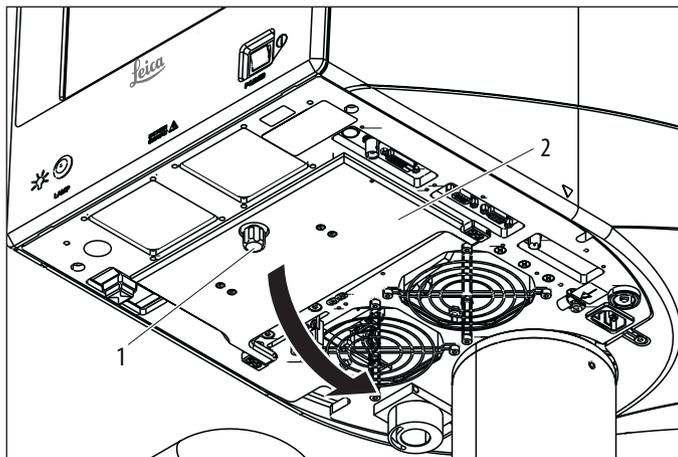
- ▶ Press the "CONFIRM" button.
The dialog window is closed.

11.4 Changing bulbs

- !** The LED can only be exchanged by a Leica Service person.
 - ▶ Before replacing the lamp, disconnect the surgical microscope from the power supply.

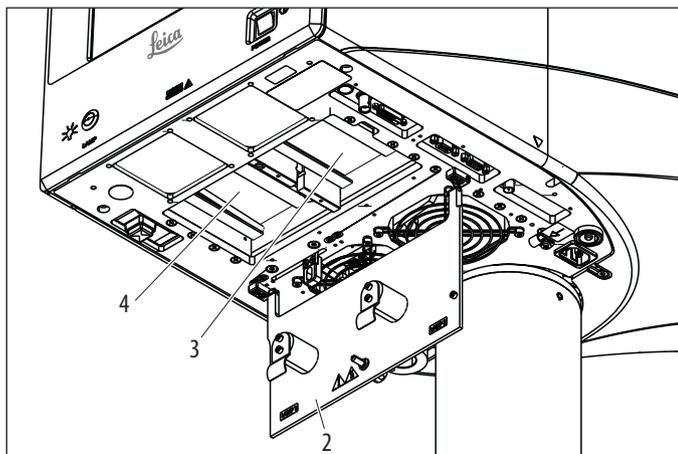
11.4.1 System without documentation system

- ▶ Open access door (2) for lamp insert by unscrewing knob (1).



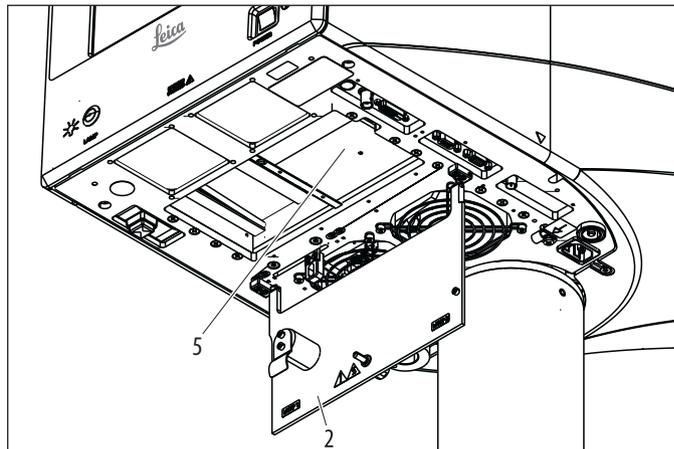
- !** **CAUTION**
Danger of skin burns. The lamp insert gets very hot.
 - ▶ Check that the cover has cooled before you replace the lamp.
 - ▶ Do not touch the hot lamp insert.

- ▶ Remove the defective lamp insert (3 or 4) and install a new lamp insert (available from Leica Microsystems).



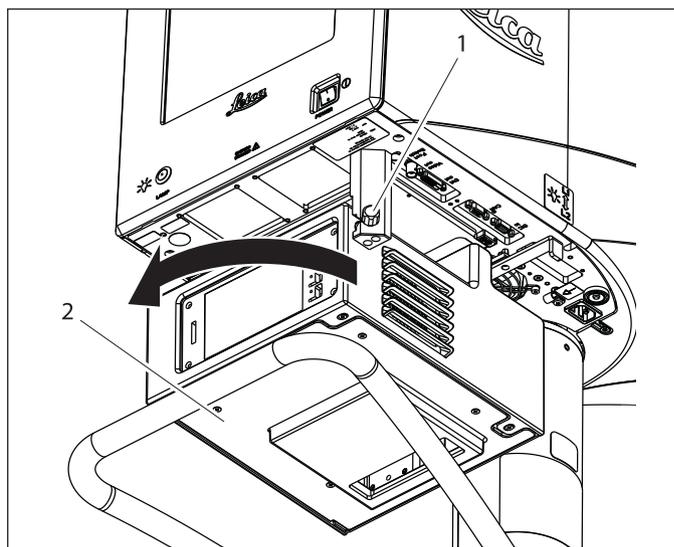
- ▶ Close the access door.
- ▶ Switch on the surgical device.
 A lamp test for both lamps is carried out.
- ▶ Set the respective lamp timer to zero ("Maintenance → Lamp History" on page 48).

PROVIDO with LED as lamp 2



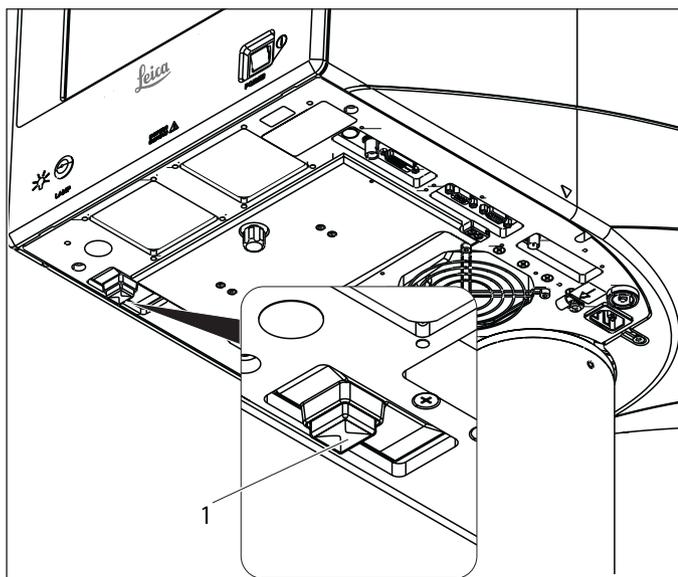
- ▶ Have the defective LED (5) exchanged by a Leica Service person.

11.4.2 System with documentation system (optional)



- ▶ Loosen the screw (1).
- ▶ Push the documentation holder (2) 90° to the left side.
- ▶ Refer to section 11.4.1 to change the bulbs.
- ▶ Push the documentation holder back to the original position and tighten the screw (1).

11.5 Circuit Breaker Switch



Circuit breaker switch by default is always pressed.

- ▶ Press the circuit breaker switch (1) if the system had a power trip.

11.6 Notes on reprocessing of resterilizable products

11.6.1 General

Products

Reusable products supplied by Leica Microsystems (Schweiz) AG such as rotary knobs, objective protective glasses and capping pieces.

Limitation of reprocessing:

For the medical devices used on patients suffering from Creutzfeldt Jacob Disease (CJD) or suspected of having CJD or variant CJD, the local statutory requirements have to be met. Normally resterilizable products used on this group of patients are to be eliminated without risk by incineration.

Occupational safety and health protection

Particular attention must be paid to the occupational safety and health protection of the persons responsible for preparing contaminated products. Current regulations of hospital hygiene and prevention of infection must be observed in the preparation, cleaning and disinfection of the products.

Limitation of reprocessing

Frequent reprocessing has little effects on these products. The end of the product life cycle is usually determined by wear and tear and damage through use.

11.6.2 Instructions

Workplace

- ▶ Remove surface contamination with a disposable cloth/paper cloth.

Storage and transport

- No special requirements.
- It is recommended to perform the reprocessing of a product immediately following its use.

Preparation for cleaning

- ▶ Remove the product from the PROVIDO.

Cleaning: manually

- Equipment: running water, detergent, alcohols, microfiber cloth

Procedure:

- ▶ Rinse surface contamination off of the product (temp. < 40 °C). Use some rinsing agent depending upon degree of contamination.
- ▶ Alcohol may also be used to clean the optics if heavy contamination such as fingerprints, grease streaks etc. is present.
- ▶ Dry off products, except for optical components, with a disposable cloth/paper cloth. Dry off optical surfaces with a micro-fiber cloth.

Cleaning: automatically

- Equipment: cleaning/disinfecting device

It is not recommended to clean products with optical components in a cleaning/disinfecting device. In addition, optical components must not be cleaned in ultrasonic baths in order to prevent damage.

Disinfection

The alcohol disinfection solution "Mikrozid, Liquid" may be used in accordance with the instructions on the label. Please note that after disinfection, the optical surfaces must be rinsed thoroughly with fresh drinking water, followed by fresh demineralized water. The products must be dried thoroughly before the subsequent sterilization.

Maintenance

No special requirements.

Control and functional test

Check the snap-on behavior of rotary knobs and handles.

Packaging

Individual: A standard PE bag may be used. The bag must be large enough for the product so that the closure is not under tension.

Sterilization

See Sterilization table on page 54.

Storage

No special requirements.

Additional information

None

Contact information of manufacturer

Address of local agent

Leica Microsystems (Schweiz) AG verified that the aforementioned instructions for the preparation of a product are suitable for its reuse. The processing person is responsible for reprocessing with the equipment, materials and personnel and for achieving the desired results in the reprocessing installation. In general, this requires validations and routine monitoring of the process. Every deviation from the supplied instructions should also be examined carefully by the processing person to determine effectiveness and possible detrimental consequences.

11.6.3 Sterilization table

The following table gives an overview of the available sterilizable components to the surgical microscopes of Leica Microsystems (Schweiz) AG, Medical Division.

Article No.	Designation	Permissible sterilization methods			Products						
		Steam autoclave 134 °C, t > 10 min.	Ethylene oxide max. 60 °C	STERRAD® 1)	M320	M220	M620	M844 M822 M820	M525	M530	M720
10180591	Clip-on handle	✓	–	✓	–	–	✓	✓	–	–	–
10428328	Rotary knob, binocular tubes T	✓	–	–	–	✓	–	✓	✓	✓	✓
10384656	Rotary knob, transparent	✓	–	✓	–	✓	✓	–	–	–	–
10443792	Lever extension	✓	–	–	–	–	✓	✓	–	–	–
10446058	Protective glass, multifocal lense	✓	✓	✓	–	–	–	–	✓	✓	–
10448439	Protective glass	✓	✓	–	–	–	–	✓	–	–	✓
10448440	Cover, sterilizable	✓	–	–	✓	–	–	–	–	–	–
10448431	Protective objective glass	✓	✓	✓	✓	–	–	–	–	–	–
10448296	Protective objective glass, spare part (package of 10)	✓	✓	–	–	–	–	✓	–	–	✓
10448280	Protective objective glass, complete, sterilizable	✓	✓	–	–	–	–	✓	–	–	✓
10448581	Cover, sterilizable for RUV800	✓	–	–	–	–	–	✓	–	–	–
10731702	Cover, sterilizable	✓	–	✓	✓	–	–	✓	–	–	–
10429792	Sleeve for slit illuminator	✓	–	✓	–	–	–	–	–	–	–

1) This medical device falls within the validated sterility claims of the STERRAD®100S / STERRAD® 100NX™ / STERRAD®50 / STERRAD®200

Systems. Please follow the instructions for use of your STERRAD® System Umser's Guide prior to sterilizing devices in STERRAD® Systems.

12 Disposal

The respective applicable national laws must be observed for disposal of the products, with the involvement of corresponding disposal companies. The unit packaging is to be recycled.

13 What to do if ...?

! If your instrument has a malfunction that is not described here, please contact your Leica representative.

13.1 Malfunctions

Malfunction	Cause	Remedy
The microscope tilts when you press the "All Brakes " button.	The arm system is not correctly balanced.	▶ Balance microscope carrier (see page 13).
The microscope cannot be moved or moved only with a great deal of effort.	A cable is caught.	▶ Reroute affected cable.
	PROVIDO locked.	▶ Release the locking mechanism (see page 23).
Functions cannot be activated using the footswitch or the controls on the handles.	A cable connection has come loose.	▶ Check the footswitch connection.
	Incorrect assignment entered at control unit.	▶ Change the assignment using the control unit.
No light in the microscope.	The fiber-optic light guide has been disconnected.	▶ Check the connection of the fiber-optic light guide.
	Main illuminator and/or auxiliary illumination defective.	▶ Switch to the other illuminator (see page 34).
Light intensity below expectation.	Fiber optics cable not in place properly.	▶ Check connection of fiber optics cable.
	Lamp life time over.	▶ Check lamp life time and change bulbs, if required.
Back assistant / side assistants have no light.	Selection of the assistants not correct.	▶ Check selection of the assistants (see page 27).
Left / right side assistant has no light.	Selection of the assistant not correct.	▶ Check selection of the assistant (see page 27).
The image remains unfocussed.	Eyepieces are not mounted correctly.	▶ Screw the eyepieces all the way on.
	Diopters not set correctly.	▶ Perform dioptric correction exactly according to the instructions (see page 27).
	AutoFocus not working properly.	▶ Check AutoFocus settings (see page 46).
The microscope or arm system moves up/ down or rotates on its own accord.	Arm system is not correctly balanced.	▶ Balance out PROVIDO (see page 13).
	Cables are not correctly laid or have slipped out of position and exert force on the system (possibly additional video cable).	▶ Route cables according to installation guide and implement strain relief.
	PROVIDO was balanced in a locked state.	▶ Release the locking mechanism (see page 23) and balance the PROVIDO (see page 13).
The microscope and microscope carrier can be moved only with difficulty or not at all.	Balancing has not been completed.	▶ Make sure that position B has been assumed (see page 13).
Magnification cannot be adjusted electrically.	Failure of magnification motor.	▶ Press the magnification rotary knob. ▶ Set magnification by turning (see page 36).
No XY movements possible at one of the two handles.	No XY movements configured for the handles in the control unit.	▶ Set the joystick to XY movement (see page 45).

Malfunction	Cause	Remedy
The microscope has not been balanced exactly in the B-axis.	Installed accessory was not turned back to the working position when balancing the B axis.	<ul style="list-style-type: none"> ▶ Rebalance the B-axis. ▶ Make sure that the accessory is turned back to the working position when balancing the B-axis (see page 13).
Arm system cannot be moved.	Arm system locked in position.	▶ Release the locking mechanism (see page 23).
The stand of the PROVIDO moves.	Footbrakes not applied.	▶ Fix footbrakes in place (see page 23).
The range of movement of the PROVIDO is limited (swing, tilt, rotate, XY movement).	Cable laid too tightly.	▶ Re-lay the cable (see assembly instructions PROVIDO).
	Drape too tight.	▶ Slightly loosen drape.
	Video camera was not correctly mounted and touches the arm system.	▶ Properly install the video camera.
PROVIDO is not correctly balanced.	Position of accessory was changed after balancing.	▶ Balance out PROVIDO (see page 13).
PROVIDO cannot be balanced.	PROVIDO was balanced in the transport position.	▶ Take the PROVIDO out of transport position and rebalance it.
Iris does not follow magnification.	Autoliris in override mode.	▶ Press the Autoliris reset button.
Working distance does not move.	Working distance emergency drive blocked by drape.	▶ Release working distance emergency drive.
Working distance on microscope cannot be adjusted.	Leica FocusLock activated.	<ul style="list-style-type: none"> ▶ Check Leica FocusLock settings. Exception: You are working with a laser micromanipulator on which this function has been programmed for safety reasons.
The image appears shaded through the microscope at the edges and the illumination field is outside the field of vision.	Accessories not installed exactly.	▶ Install the accessories exactly in the holders (see page 25).

13.2 Malfunctions documentation accessories

Malfunction	Cause	Remedy
Video pictures unfocussed.	Microscope or Video Adapter not precisely focussed.	<ul style="list-style-type: none"> ▶ Focus precisely, use graticule if necessary. ▶ Perform diopter correction exactly according to the instructions.

13.3 Error messages on the control unit

When the control unit detects an error, the yellow "Check" button lights up.

- ▶ Press the "Check" button.
The list with error messages is displayed.
- ▶ To acknowledge a message, select the message and press the "Confirm" button.
When there is no error message pending, the yellow "Check" button disappears.

Message	Cause	Remedy
Luxmeter, no calibration data available	Luxmeter may not be calibrated.	▶ Contact your Leica Representative.
Lamp1 overtemperature	The ventilation hole may be clogged/blocked.	▶ Remove any blockage from the ventilation hole.
Lamp2 overtemperature	The ventilation hole may be clogged/blocked.	▶ Remove any blockage from the ventilation hole.
Lamp1 fan defective	Lamp 1 fan is defective.	▶ Contact your Leica Representative.
Lamp2 fan defective	Lamp 2 fan is defective.	▶ Contact your Leica Representative.
Lamp door is open	The access door of the illumination unit is not closed. The push button for Illumination on/off flashes.	▶ Close the access door of the illumination unit and lock it using the door knob.
Lamp1 defective	Lamp 1 is defective.	▶ After the operation replace lamp 1.
Lamp2 defective	Lamp 2 is defective.	▶ After the operation replace lamp 2.
Exhaust fan defective	The exhaust fan is defective.	▶ Contact your Leica Representative.
Overtemperature in tower base	The ventilation hole may be clogged/blocked.	▶ Remove any blockage from the ventilation hole.
No lamp selected	The lamp selection switch is in an intermediate position.	▶ Move the knob to a valid position.
Optics carrier not found	<ul style="list-style-type: none"> • Cable Connection loose. • Cable damaged. • Controller defective. 	▶ Contact your Leica Representative.
CAN-handle left not found	<ul style="list-style-type: none"> • Cable Connection loose. • Cable damaged. • Controller defective. 	▶ Contact your Leica Representative.
CAN-handle right not found	<ul style="list-style-type: none"> • Cable Connection loose. • Cable damaged. • Controller defective. 	▶ Contact your Leica Representative.
Autofocus not found	<ul style="list-style-type: none"> • Cable Connection loose. • Cable damaged. • Controller defective. 	▶ Contact your Leica Representative.
Camera control unit not found	The camera may not have been switched on.	▶ Switch on the camera. Contact your Leica Representative if error persists.
Luxmeter defective error	Photodiode in the optics carrier may be defective or the light guide is not fully plugged in.	▶ Plug in the light guide properly or contact your Leica Representative if error persists.

14 Specifications

14.1 Electrical data

Power connection for PROVIDO	800 VA 50/60 Hz 100–240 V~ 50/60 Hz
Protection class	Class 1

14.2 Leica M530

14.2.1 Microscope features

Magnification	6:1 zoom, motorized
Objective / working distance	225–600 mm, motorized multifocal lens, continuously adjustable; manual adjustment option
Eyepieces	Wide-field eyepieces for persons wearing glasses 8.3×, 10× and 12.5× dioptic adjustment ±5 diopter settings; adjustable eyecup
Illumination	Illumination system specially developed for microsurgical applications; Continuously variable illumination field diameter with Gaussian light distribution. Continuously adjustable brightness at constant color temperature
Autolris	Built-in automatic zoom-synchronized illumination field diameter, with manual override and reset feature
Main illuminator	High-output xenon lamp 300 W, via fiber optics cable
Emergency lamp	75 W LED or 300 W xenon arc-lamp with redundant electrical high voltage part
BrightCare Plus	Safety function through working distance-dependent limitation of the brightness, controlled by a built-in luxmeter
SpeedSpot	Laser focussing aid for fast and exact positioning of the microscope Laser Class 2 Wave length 635 nm Optical power <1 mW
Fine focus	Available for back side assistant
Magnification multiplier	1.4×
IR sensor	For remote control of the Leica HD C100

14.2.2 Optical data

Zoom magnification binocular tubes with focal length f162.66	Working distance				
	225 mm		600 mm		
	M _{tot}	FoV [mm]	M _{tot}	FoV [mm]	
Eyepiece 8.3×	min.	1.60	114.5	0.80	230.4
	max.	9.6	19.1	4.8	38.4
Eyepiece 10×	min.	1.92	109.3	0.96	219.9
	max.	11.5	18.2	5.7	36.7
Eyepiece 12.5×	min.	2.40	88.5	1.19	178.0
	max.	14.4	14.7	7.2	29.7

Zoom magnification binocular tubes with focal length f170.0	Working distance				
	225 mm		600 mm		
	M _{tot}	FoV [mm]	M _{tot}	FoV [mm]	
Eyepiece 8.3×	min.	1.68	109.4	0.83	220.2
	max.	10.1	18.2	5.0	36.7
Eyepiece 10×	min.	2.01	104.4	1.0	210.2
	max.	12.1	17.4	6.0	35.0
Eyepiece 12.5×	min.	2.51	84.5	1.25	170.1
	max.	15.1	14.1	7.5	28.35

M_{tot} Total magnification
FoV Field of View

The values above contain a tolerance of ±5 %

Binocular tube	Focal length	Art. No
Type A	f162.66	10448088
Type B	f170.0	10446797

14.2.3 Selectable options

Leica M530 with Top Plate

Top plate	Full stereo view for main surgeon and back assistant Semi stereo view for single side assistant either left or right Optional: C-mount interface for camera
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Leica M530 with IVA530

IVA530	Full stereo view for main surgeon Semi stereo view for single side assistant either left or right C-mount interface for camera
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Leica M530 with ULT530

ULT530	Full stereo view for main surgeon and back assistant Semi stereo view for single side assistant either left or right Optional: HD Camera integrated (Leica HD C100)
Leica FL800 ULT	ULT with the Leica FL800 function
Leica FL560 for M530	Leica FL560 observation filter module

14.2.4 Leica M530 optics carrier

Rotation of optics	± 270°
Lateral tilt	45° to left / 45° to right
Inclination tilt	-30° / +95°
Balancing	A, B and C axes, each can be corrected manually
Brakes	1 brake for A/B axis 1 brake for C axis
Indicator	LED for Fluorescence mode status LED for Fluorescence video record status
IR sensor	for remote control of the external Leica HD C100 camera

Leica M530 with IVA530

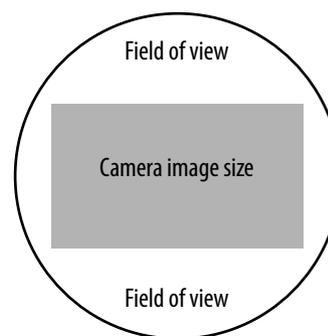
Integrated video adapter	for attachment of an external C-mount video camera, preferably with sensor size 1/3"
FusionOptics	for increased depth of field for main surgeon
Integrated 360° rotatable adapter	for main surgeon binocular
Side assistant	Selectable, left or right
Light distribution	67 % for surgeon 23 % for side assistant 10 % for C-mount port

Leica M530 with ULT530

Integrated camera for visible light	Leica HD C100 built in 1/3" CCD (optional)
FusionOptics	for increased depth of field for main surgeon and back assistant
Manual fine focus	for back assistant, ±5 Dpt
Integrated 360° rotatable adapter	for main surgeon and back assistant binocular
Light distribution	50 % for main surgeon assistants switchable: either 15% for side assistant or 30% for back assistant

Camera image size with respect to the field of view

- Camera for visible light



! The figure shows the camera image size with respect to the field of view for the visual video camera. Please be aware that the field of view is not fully covered by the documentation system.

! For further information refer to the corresponding user manuals.

14.3 PROVIDO floor stand

Type	Floor stand with 6 electromagnetic brakes
Base	760 × 760 mm with 4 castor wheels being able to rotate 360 degrees. The brake function of the castor wheels is locked/unlocked by the foot pedals.
Balancing	Manual balancing at microscope carrier and at swing arm
Floor stand control unit	The latest electronics control for the continuous governing of all motor functions and the light intensity. Built-in BrightCare Plus safety function for limiting brightness depending on working distance. Menu selection based on unique software for user-specific configuration, with built-in electronic auto-diagnosis and user support.
Control unit stand	Software independent hard key for illumination. Indicator for Main/backup illumination and Fluorescence modes. Open architecture for future software developments.
Light source	Single Xenon arc-lamp as main illumination with LED lamp as back up. Dual Xenon arc-lamp illumination system (optional).
Control elements	Pistol handle with 10 functions for magnification, working distance, "All Brakes" button releases 6 brakes, side knob releases selected brake combinations, motorized side tilt (XY). All buttons other than "All Brakes" are freely assignable. Footswitch.
Integrated documentation	Prepared for integration of video camera system and digital recording system. Open architecture
Connectors	Numerous built-in connectors for Video and control data transfer. Internal power supply 12 VDC, 24 VDC and AC terminals
Carrier for monitor	610 mm long and flexible arm with 180° rotation and inclination to carry optional video monitor
Materials	All solid metal construction
Surface coating system	Coated with antimicrobial paint
Minimum height	In park position: 1955 mm
Range Cantilever	Max. 1487 mm
Load	Max. 8.5 kg from microscope dovetail ring interface
Weight	Approx. 370 kg without load

14.4 Ambient conditions

In use	+10 °C to +40 °C +50 °F to +104 °F 30 % to 95 % rel. humidity 800 mbar to 1060 mbar atmospheric pressure
Storage	-30 °C to +70 °C -86 °F to +158 °F 10 % to 100 % rel. humidity 500 mbar to 1060 mbar atmospheric pressure
Transport	-30 °C to +70 °C -86 °F to +158 °F 10 % to 100 % rel. humidity 500 mbar to 1060 mbar atmospheric pressure

14.5 Electromagnetic compatibility (EMC)

Environment for which the instrument is suitable

Hospitals except for near active HF Surgical Equipment and the RF shielded room of an ME System for magnetic resonance imaging, where the intensity of EM Disturbances is high.

Compliance IEC 60601-1-2

- | | |
|-----------|--|
| Emissions | <ul style="list-style-type: none"> • CISPR 11, Class A, Group 1 • Harmonic Distortion per IEC 61000-3-2 Class A • Voltage Fluctuation and Flicker per IEC 61000-3-3 Class A, Figures 3-7 |
| Immunity | <ul style="list-style-type: none"> • Electrostatic discharge IEC 61000-4-2: CD +/- 8 kV, AD +/- 15 kV • Radiated RF EM Fields IEC 61000-4-3: 80 – 2700 MHz: 10 V/m • Proximity Wireless fields IEC 61000-4-3: 380 – 5785 MHz: 9 V/m; 28 V/m • Electrical Fast Transients and bursts IEC 61000-4-4: ± 2 kV: Power supply lines • Surges IEC 61000-4-5: ± 1 kV Line-to-line
± 2 kV Line-to-ground • Conducted disturbances, induced by RF fields IEC 61000-4-6: 10 V rms • Rated Power-frequency Magnetic Field IEC 61000-4-8: 30 A/m • Voltage dips and interruptions IEC 61000-4-11: according to IEC 60601-1-2:2014 |

14.6 Standards fulfilled

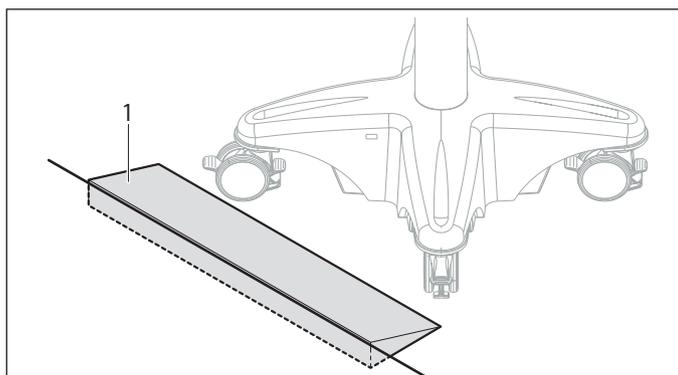
CE conformity

- Medical Devices Directive 93/42/EEC including amendments.
- Classification: Class I, in compliance with Annex IX, Rule 1 and Rule 12 of the Medical Devices Directive.
- Medical electrical equipment, Part 1: Generally defined for the security in IEC 60601-1; EN 60601-1; UL 60601-1; CAN/CSA-C22.2 NO. 60601-1:14 (2014).
- Electromagnetic compatibility IEC 60601-1-2; EN 60601-1-2; EN 61000-3-2; IEC 61000-3-2.
- Further applied harmonized standards: IEC 62366, IEC60825-1, EN60825-1, IEC 62471, EN62471.
- The Medical Division, within Leica Microsystems (Schweiz) AG, holds the management system certificates for the international standard ISO 13485 relating to quality management and quality assurance.

14.7 Limitations of use

The PROVIDO may be used only in closed rooms and must be placed on a solid floor.

The PROVIDO is not suitable for crossing thresholds higher than 20 mm. To move the surgical microscope over thresholds of 20 mm, the wedge (1) included in the packaging can be used.



- ▶ Place the wedge (1) in front of the threshold.
- ▶ Move the surgical microscope across the threshold in transport position, pushing it by the handgrip.



CAUTION

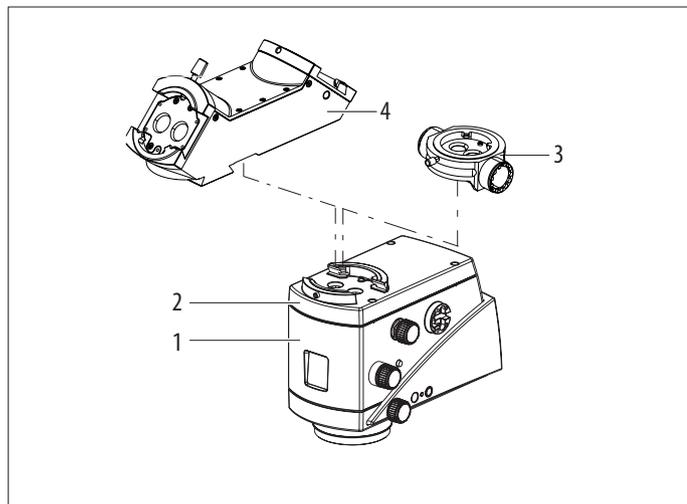
Damage to the PROVIDO during transportation.

- ▶ Never move the stand in the extended condition.
- ▶ Always change to transport position before move PROVIDO stand.
- ▶ Never roll over cables lying on the floor.
- ▶ Never transport or move the system at an inclination of more than 10°.
- ▶ Do not tilt the system to more than 10° as it might tip over.
- ▶ Only move the PROVIDO in transport position.

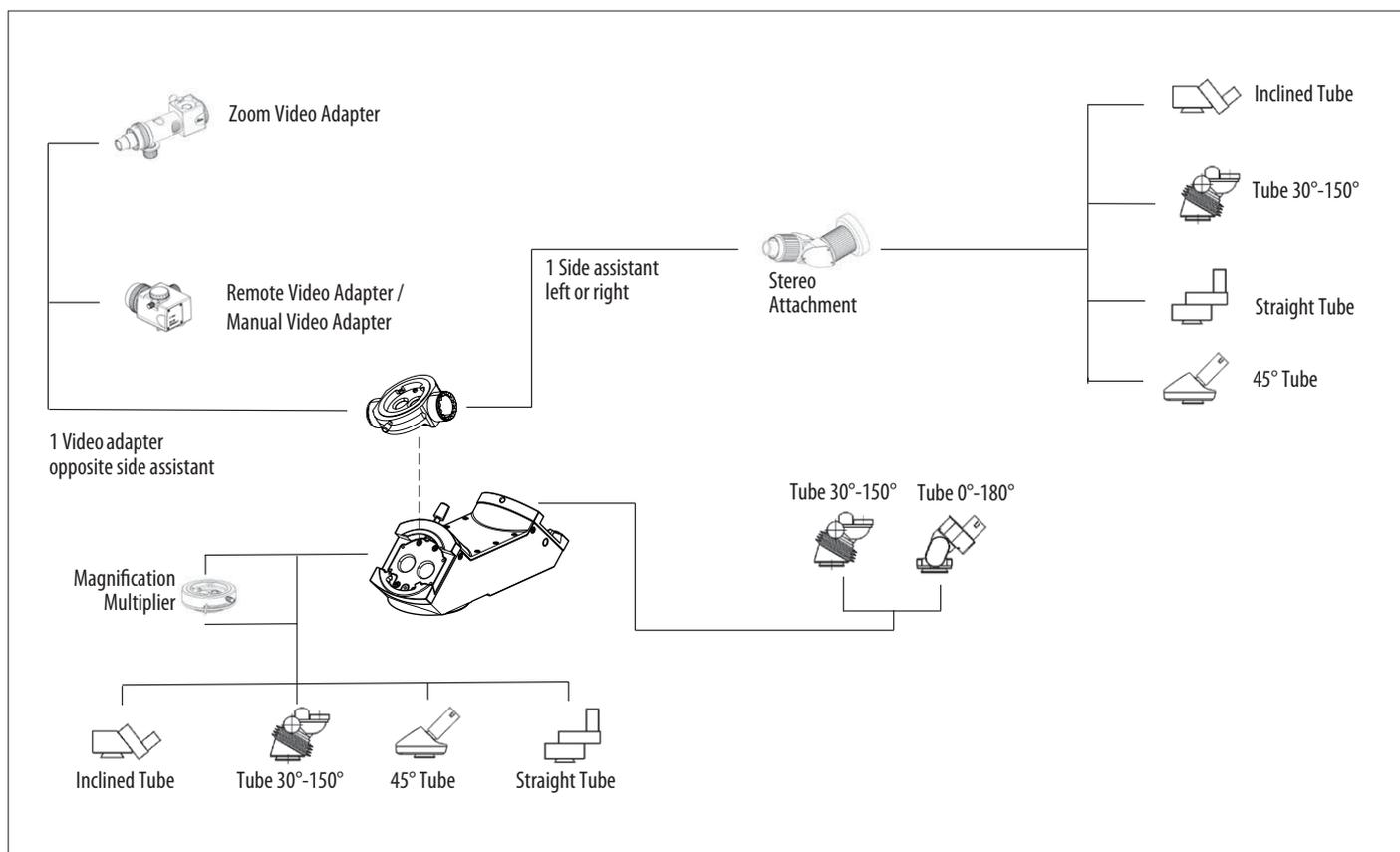
14.8 List of weights of balanceable configurations

14.8.1 Leica M530 with top plate and 180° Dual Stereo Attachment

The 180° Dual Stereo Attachment is mounted on the Leica M530 with the Beamsplitter.



- 1 Optics carrier
- 2 Top plate
- 3 Beamsplitter
- 4 180° Dual Stereo Attachment

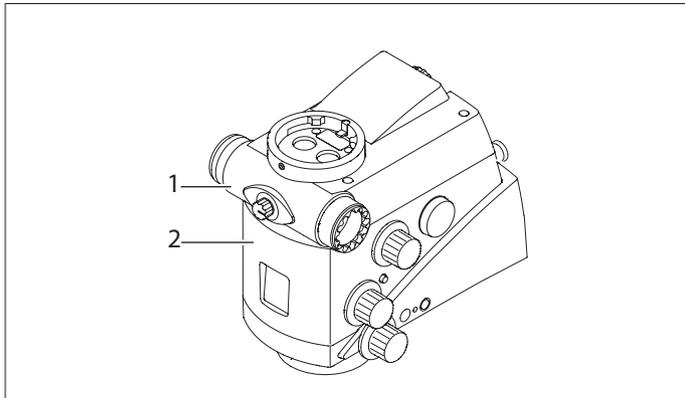


Equipment of PROVIDO Serial No. Max.
load on microscope optics carrier: 8.5 kg

Equipment of Leica M530 with Top plate and 180° Dual Stereo Attachment				Installation	
Art. No.	Description	Comment / Restrictions	Weight	#	Total
10448692	M Top plate		0.22 kg		.
10446565	S Beamsplitter 70/30 %		0.40 kg		.
10446567	M 180° Dual Stereo Attachment		0.98 kg		.
	M Binocular tube for main surgeon	Overall, 4 tubes must be installed. Maybe the orientation of the tubes must be adapted to balance the system.			.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
10448668	O Magnification multiplier		0.28 kg		.
	M Binocular tube for back assistant				.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448088	S Binocular tube var. 0°-180° T, Type II		1.42 kg		.
	M Side observation	Only 1 piece, left or right, must be opposite to Video adapter			.
10448597	S Stereo attachment		1.01 kg		.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
	M Binocular tube on Stereo attachment	If Stereo attachment is selected			.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448028	S Eyepiece 10x	2 eyepieces per binocular tube	0.10 kg		.
10448125	S Eyepiece 8.3x		0.10 kg		.
10443739	S Eyepiece 12.5x		0.10 kg		.
M = Must, O = Option, S = Selection				continued on next page	
				Load	.

Equipment of Leica M530 with Top plate and ULT530				Installation	
Art. No.	Description	Comment / Restrictions	Weight	#	Total
	M Video adapter	Only 1 piece, left or right			.
10448215	S ZVA		0,74 kg		
	S MVA/RVA		0,40 kg		
	0 Camera	Recommended: Leica HD C100	0,12 kg		.
	0 Laser micro manipulator				.
	0 Laser filter	0-2 pieces, (main, back, side)			.
10446058	0 Protective glass		0,02 kg		.
Load from previous page					.
M = Must, 0 = Option, S = Selection				Total Load	.

14.8.2 Leica M530 with IVA530

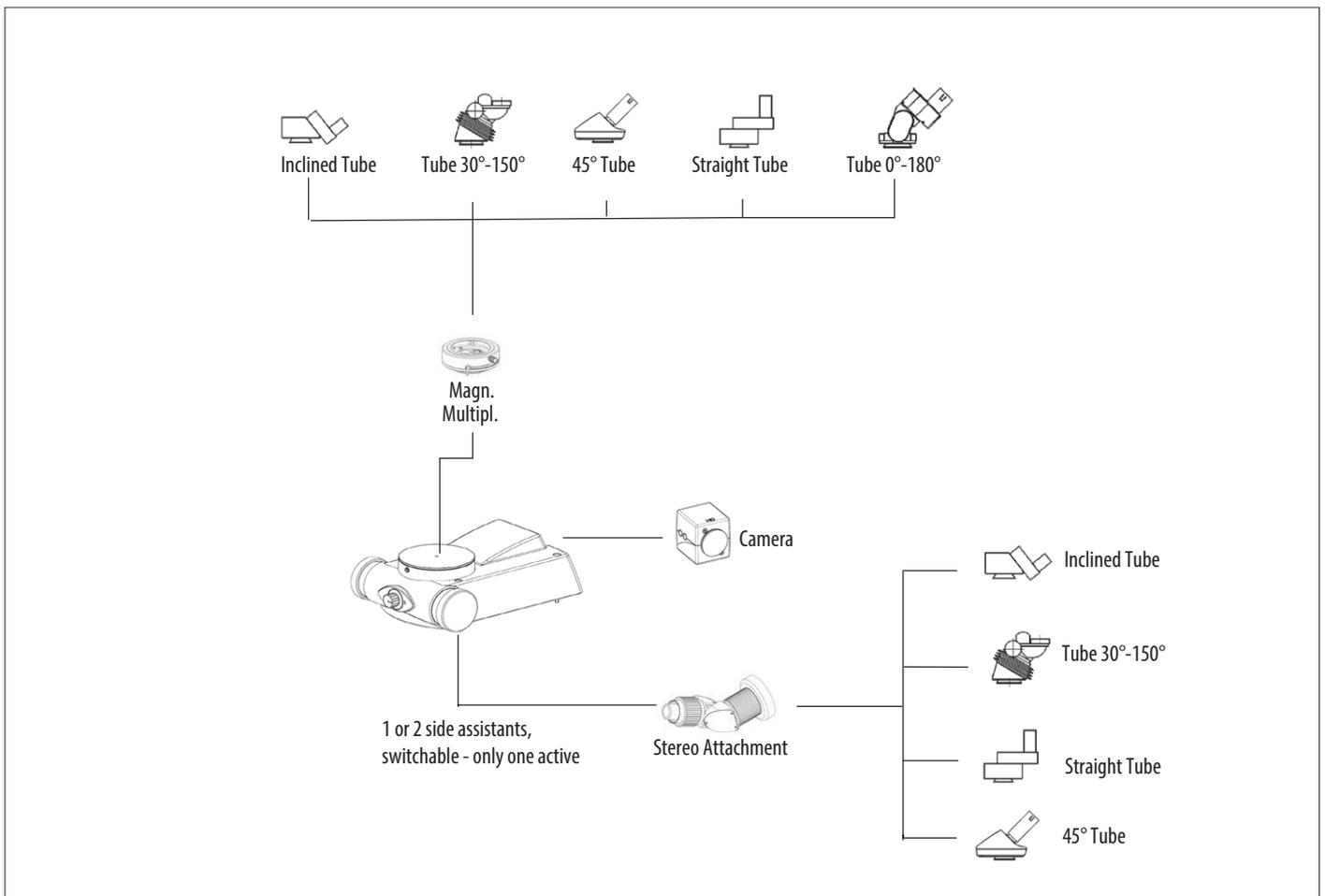


- 1 Leica with IVA530
- 2 Optics carrier

NOTE

Destruction of the IVA530 optics.

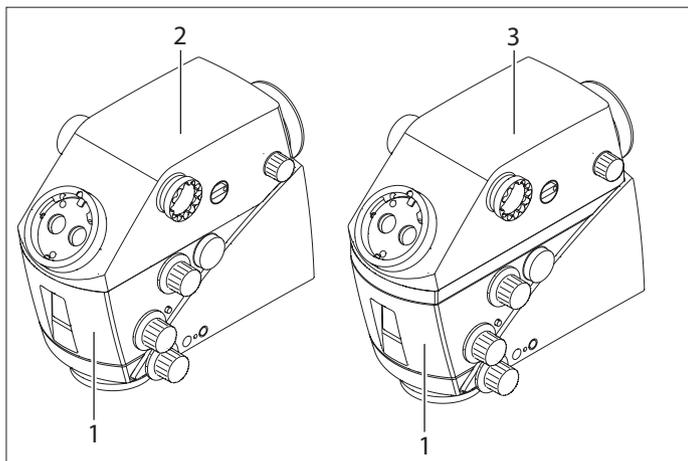
- ▶ Do not use the Zoom Video Adapter in combination with Leica M530 with IVA530.



Equipment of PROVIDO Serial No. Max. load on microscope optics carrier: 8.5 kg

Equipment of Leica M530 with IVA530				Installation	
Art. No.	Description	Comment / Restrictions	Weight	#	Total
10448691	M IVA530		0.82 kg		.
	M Binocular tube for main surgeon	Maybe the orientation of the tubes must be adapted to balance the system.			.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448088	S Binocular tube var. 0°-180° T, Type II		1.42 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
10448668	O Magnification multiplier		0.28 kg		.
	1xM Side observation	Only left or right side observation gets light at the same time (switch)			.
	1xO				.
10448597	S Stereo attachment		1.01 kg		.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
	M Binocular tube on Stereo attachment	If Stereo attachment is selected			.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448028	S Eyepiece 10x	2 eyepieces per binocular tube	0.10 kg		.
10448125	S Eyepiece 8.3x		0.10 kg		.
10443739	S Eyepiece 12.5x		0.10 kg		.
	O Camera	Max. 1 camera			.
	S C-mount camera	Recommended: Leica HD C100	0.12 kg		.
	O Laser micro manipulator				.
	O Laser filter	0-3 pieces, (main, side)			.
10446058	O Protective glass		0.22 kg		.
M = Must, O = Option, S = Selection				Total Load	.

14.8.3 Leica M530 with ULT530 or Leica FL800 ULT and Leica FL560

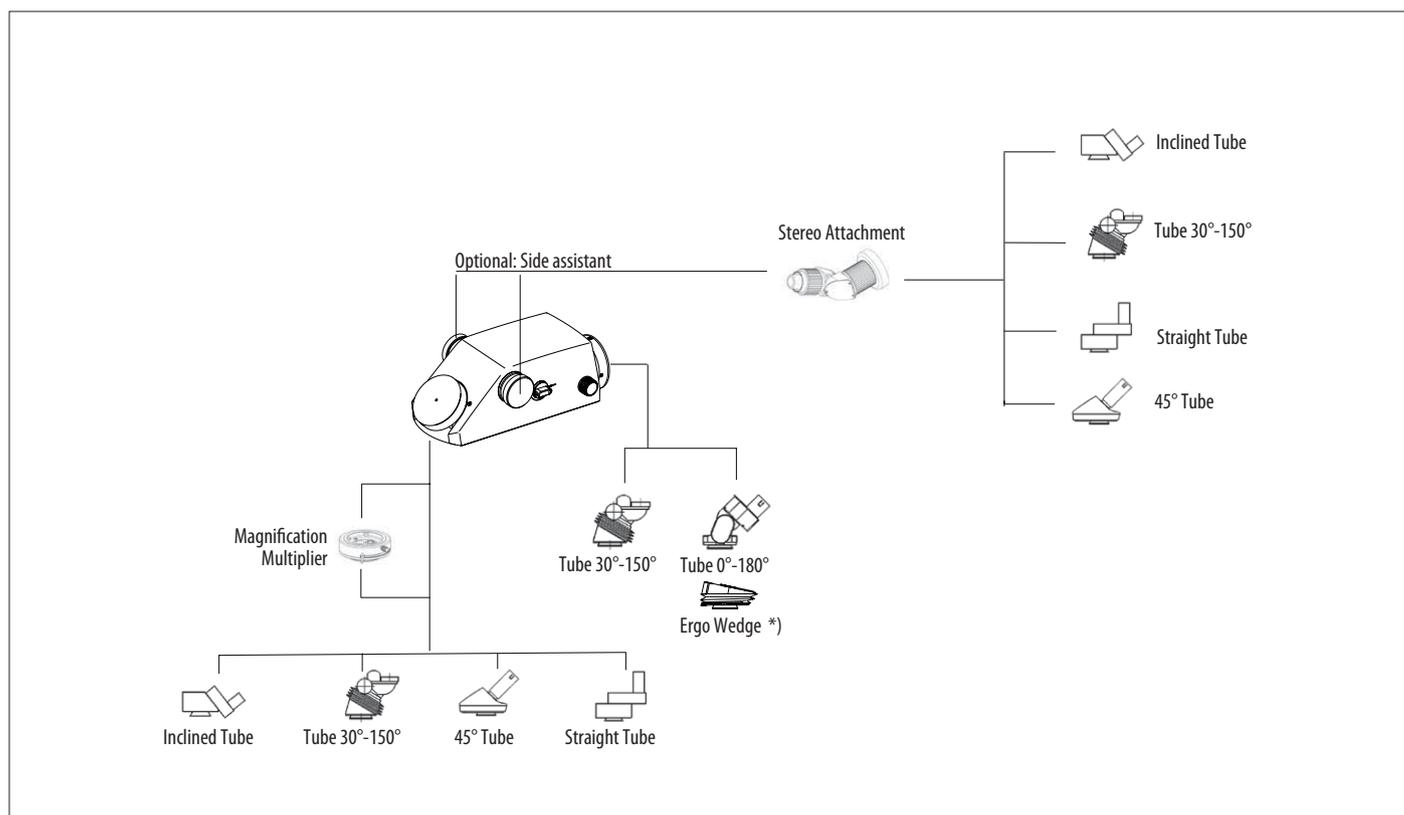


- 1 Optics carrier
- 2 ULT530 or Leica FL800 ULT
- 3 ULT530 combined with Leica FL560

NOTE

Destruction of the ULT530 optics.

- Do not use any video adapter in combination with the ULT530.



*) Ergo Wedge (10448429) can be installed below the Tube 0-180° but is not a must

Equipment of PROVIDO Serial No. Max. load on microscope optics carrier: 8.5 kg

Equipment of Leica M530 with ULT530 or with FL800 ULT				Installation	
Art. No.	Description	Comment / Restrictions	Weight	#	Total
	M Interface to ULT530				.
10449022	S ULT530		1.64 kg		.
10448795	S Leica FL560		0.47 kg		.
10449023	S Leica FL800 ULT		1.76 kg		.
	M Binocular tube for main surgeon	Maybe the orientation of the tubes must be adapted to balance the system.			
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448088	S Binocular tube var. 0°-180° T, Type II	Not recommended (vignetting)	1.42 kg		.
	M Binocular tube for back assistant				
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448088	S Binocular tube var. 0°-180° T, Type II		1.42 kg		.
10448429	O Ergo Wedge		0.4 kg		.
	O Side observation	0 or 1 side assistant			
10448597	S Stereo attachment		1.01 kg		.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
	M Binocular tube on Stereo attachment	If Stereo attachment is selected			
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10448668	O Magnification multiplier	Only 1 piece, only main surgeon and only with binocular tube 30°-150° (vignetting)	0.28 kg		.
10446797	S Binocular tube var. 30°-150° T, Type II L	Recommended	0.81 kg		.
10446587	S Straight binocular tube T, Type II		0.72 kg		.
10446618	S Inclined binocular tube 45°, Type II		0.56 kg		.
10446574	S Inclined binocular tube T, Type II		0.74 kg		.
10449016	O Leica HD C100				
	O Laser micro manipulator				
	O Laser filter	0-4 pieces, (main, back, sides)			
10448028	O Eyepiece 10x	2 eyepieces per binocular tube	0.10 kg		.
10448125	O Eyepiece 8.3x		0.10 kg		.
10443739	O Eyepiece 12.5x		0.10 kg		.
M = Must, O = Option, S = Selection				Load	
continued on next page					

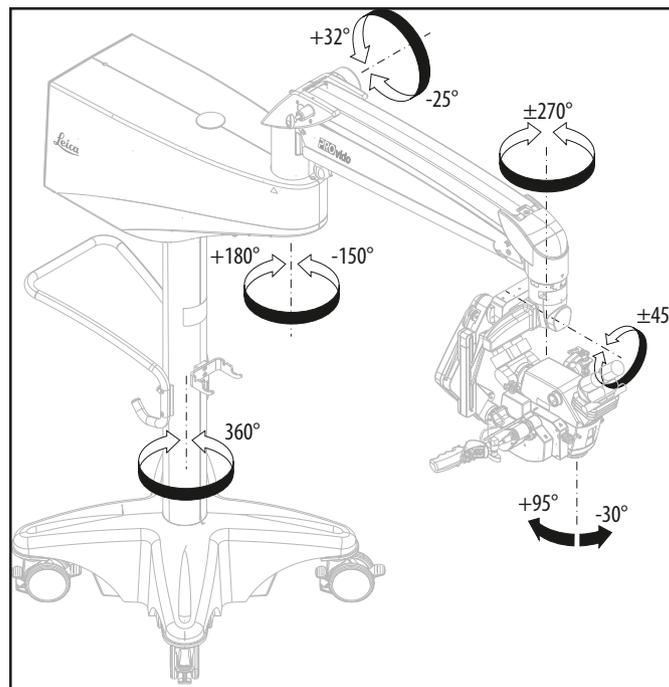
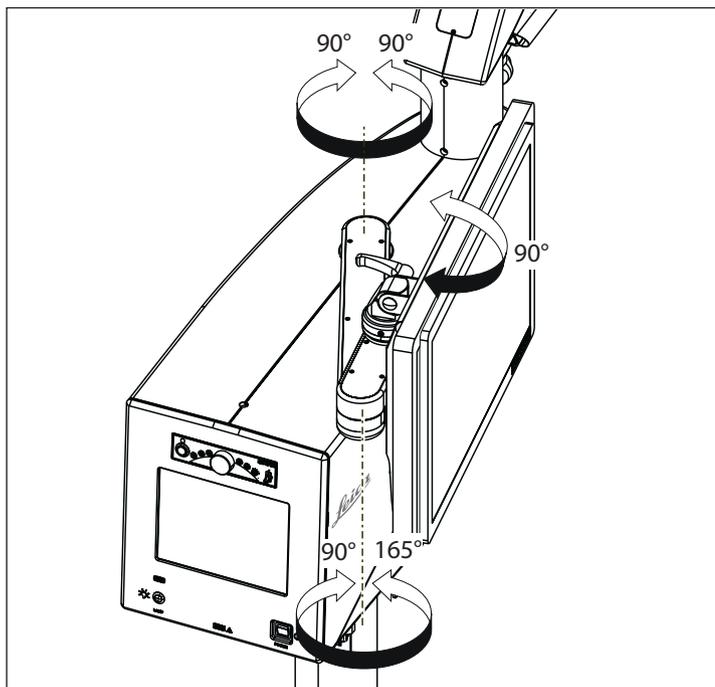
Equipment of Leica M530 with ULT530				Installation	
Art. No.	Description	Comment / Restrictions	Weight	#	Total
10446058	0 Protective glass		0.02 kg		.
	0 Laser micro manipulator				.
	0 Laser filter	0-4 pieces, (main, back, sides)			.
10448028	S Eyepiece 10x	2 eyepieces per binocular tube	0.10 kg		.
10448125	S Eyepiece 8.3x		0.10 kg		.
10443739	S Eyepiece 12.5x		0.10 kg		.
10446058	0 Protective glass		0.02 kg		.
Load from previous page					.
M = Must, O = Option, S = Selection				Total Load	.

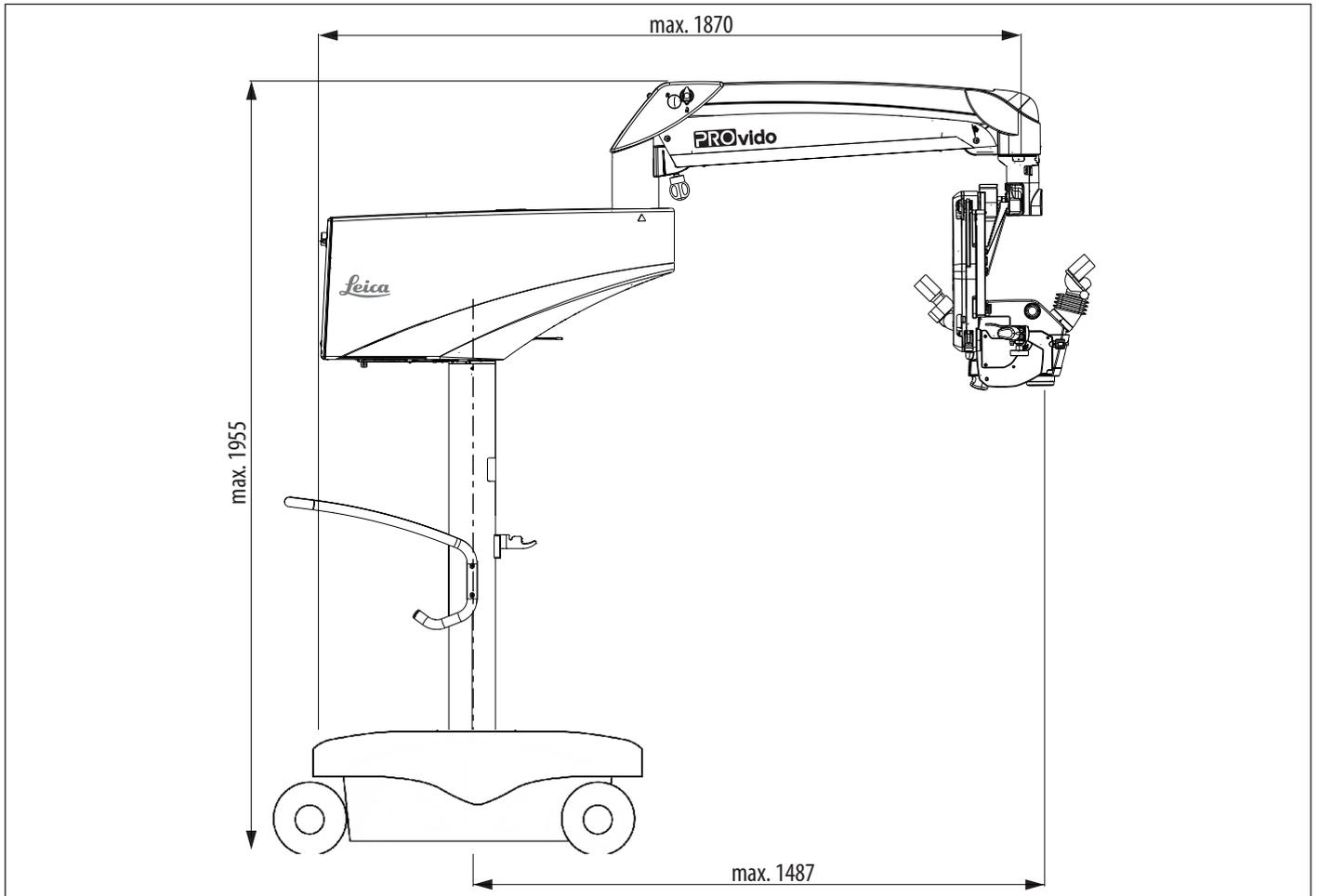
NOTE

Destruction of the ULT530 optics.

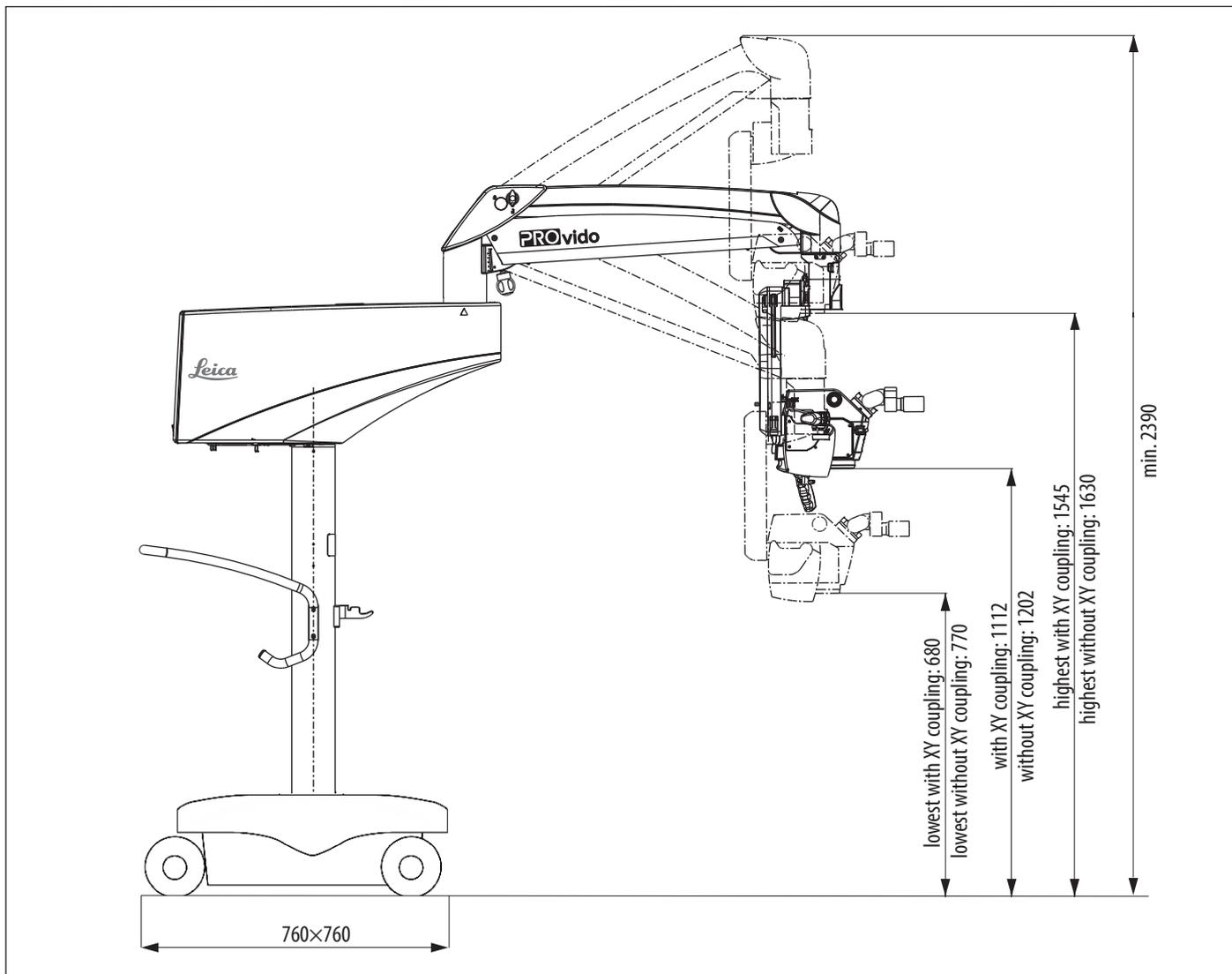
- ▶ Do not use the Zoom Video Adapter in combination with the Leica M530 with ULT530.

14.9 Dimensional drawings





Dimensions in mm



Dimensions in mm

15 Annex

15.1 Checklist before the operation

Patient

Surgeon

Date

Step	Procedure	Details	Checked / Signature
1	Cleaning the optical accessories	<ul style="list-style-type: none"> ▶ Check the tubes, eyepieces and the documentation accessories (if used) for cleanliness. ▶ Remove dust and dirt. 	
2	Installing the accessories	<ul style="list-style-type: none"> ▶ Lock the PROVIDO in place and install all accessories on the microscope so it is ready for use (see page 25). ▶ Position the handles as desired. ▶ Connect the footswitch, if used. ▶ Check the camera image on the monitor and realign if necessary. ▶ Check that all equipment is in its proper position (all covers fitted, doors closed). 	
3	Checking the tube settings	<ul style="list-style-type: none"> ▶ Check the tube and eyepiece setting for the selected user. 	
4	Function check	<ul style="list-style-type: none"> ▶ Check the fiber optics cable connection to the optics carrier. ▶ Connect the power cable. ▶ Switch on the microscope. ▶ Switch on the illuminator at the control unit. ▶ Leave the illumination on for at least 5 minutes. ▶ Check the lamp history and make sure that the remaining life time is sufficient for the planned surgery. ▶ Replace defective bulbs before the surgery. ▶ Test all functions on the handles and the footswitch. ▶ Check the user settings on the control unit for the selected user. 	
5	Balancing	<ul style="list-style-type: none"> ▶ Balance the PROVIDO (see page 13). ▶ Press the "All Brakes" button on the handle and check the balancing. 	
6	Sterility	<ul style="list-style-type: none"> ▶ Fit sterile components and sterile drape if used (see page 30). ▶ Repeat balancing. 	
7	Positioning at the OP table	<ul style="list-style-type: none"> ▶ Position the PROVIDO on the OP table as required in transport position and lock the foot brake after positioning is done (see page 28). 	

