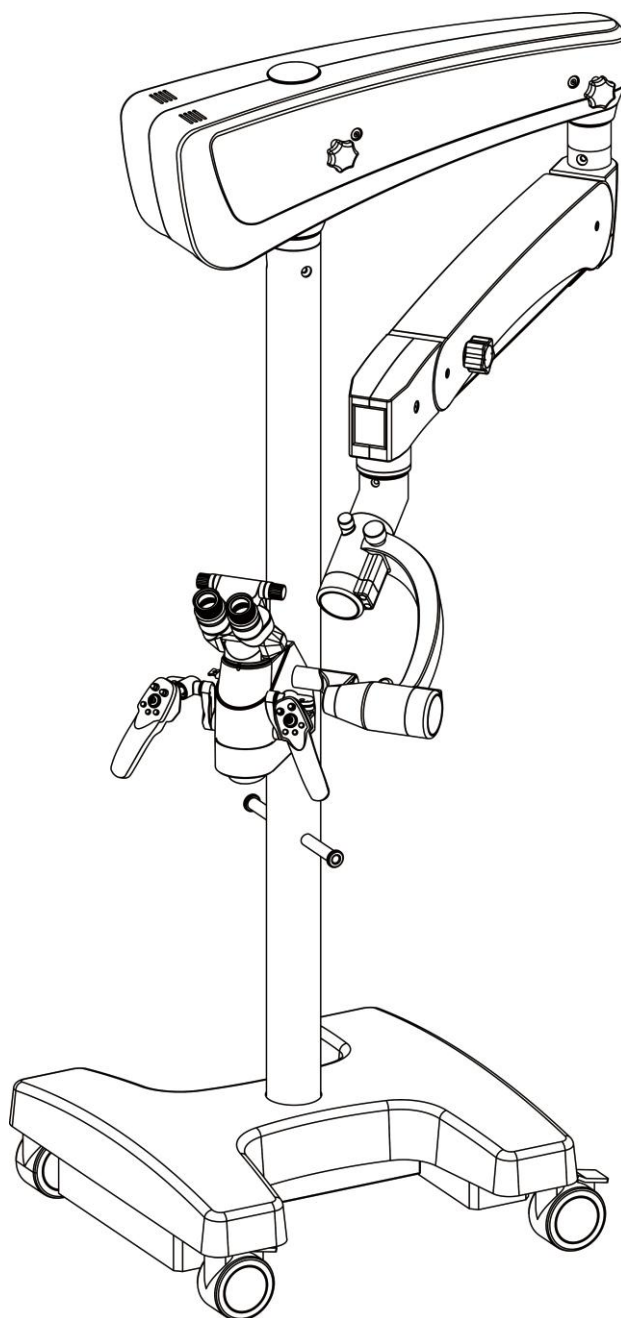




OMS3200/OMS3200 R2/OMS3200 PRO **USER MANUAL**



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Safety Information

Intended use

The surgical microscope is applicable to the microsurgery and fine examination of the clinical subjects.

Name of the devices in this manual

OMS3200 Floor stand, OMS3200 Ceiling Mount, OMS3200 Wall Mount, OMS3200 Fixed Ground.

OMS3200 R2 Floor stand, OMS3200 R2 Ceiling Mount, OMS3200 R2 Wall Mount, OMS3200 R2 Fixed Ground.

OMS3200 Pro Floor stand, OMS3200 Pro Ceiling Mount, OMS3200 Pro Wall Mount, OMS3200 Pro Fixed Ground.

Precautions

Do not use this device in an environment prone to fire or an environment with dust, airborne debris or with high temperatures. Use it in a clean and dry indoor setting only. Check that all the wires are correctly and firmly connected before using. Ensure that the instrument is well grounded.

Please pay attention to all the rated electrical values of any connecting terminal.

Only use fuse according to the specifications and rated values stipulated by our product. Use the power cable supplied with this instrument only.

Do not touch the surface of the lens and prism by bare hand or with solid objects that may damage the surface.

Turn off the main power first before replacing the illumination bulb and fuse.

To prevent the instrument from falling or tipping over, the instrument should be placed on a floor where the inclination angle is less than 10°.

Turn off the power and cover the instrument with dust-proof hood when it is not in use. In case there is any trouble, please first refer to the trouble-shooting guide. If it still cannot be resolved, please contact the authorized distributor or our After-sales Service Department.

Symbols and labels

	Warning!		Magnification adjustment
	Terminal of the protective grounding		Focus adjustment
	Balance arm regulation		Lighting switch
	< 14Kg Weight limit		Light Intensity control
	Photo / Video		Connector plug switch

	Follow instructions for use		Caution
	Manufacturer		Keep dry
	Fragile, handle with care		Serial number
	Medical device		Date of manufacture
	Authorized Representative in the European Community		Temperature limit
	Atmospheric pressure limitation		Humidity limitation
	Pushing prohibited		

Liability and warranty

For details of warranty and liability, please refer to the provisions of the warranty clause. Modifications to this device are not allowed. The manufacturer is not responsible for damage caused by unauthorized tampering with the system. In addition, it will lose any right to claim within the scope of the warranty.

Requirement for operation

Very first use

- ▶ The installation of this equipment is completed by Zumax service engineer or authorized representative of local dealer.
- ▶ Please check whether all cables and connecting parts have been installed in place before use.
- ▶ The screws which connect parts have been firmly tightened.
- ▶ The main plug can only be connected to a socket with a fault-free protective grounding conductor.
- ▶ When connecting the device to any network, make sure that there is no dangerous voltage on the network.

More requirements about the ceiling mount:

- ▶ The ceiling bracket has been correctly installed by the construction personnel in charge.
- ▶ The ceiling bracket meets the specifications contained in our "Planning Manual".

Before use

- ▶ When adding accessories and/or components, make sure that the allowable total weight of the device does not exceed the maximum load.
- ▶ Make sure to compensate for any additional weight before each use; This will allow the microscope to be balanced in all positions of the operating range.
- ▶ Please confirm whether the up and down movement of the second arm works well, so as to avoid the weightlessness of the microscope drop on the patient.
- ▶ Check the screws which connect parts have been firmly tightened.
- ▶ Four casters are with locker, please make sure at least two are locked.

During use

- ▶ Please make sure that the light source is not aimed at the patient's eyes.
- ▶ Pay attention to the position and the height of the arms, do not hit the assistant or patient.
- ▶ Please do not cover the heat elimination grooves of power source.

After use

- ▶ After each use, please turn off the main power switch of the device.
- ▶ Pay attention to the position and the height of the arms, do not hit the assistant or patient.
- ▶ Move microscope to its standby position and lock the fixation knob of each moving joint.
- ▶ Please use the dust proof cover provided by Zumax to cover the lens part of the microscope.

Security measures of balancing system

Electromagnetic release ON/OFF switch [1]

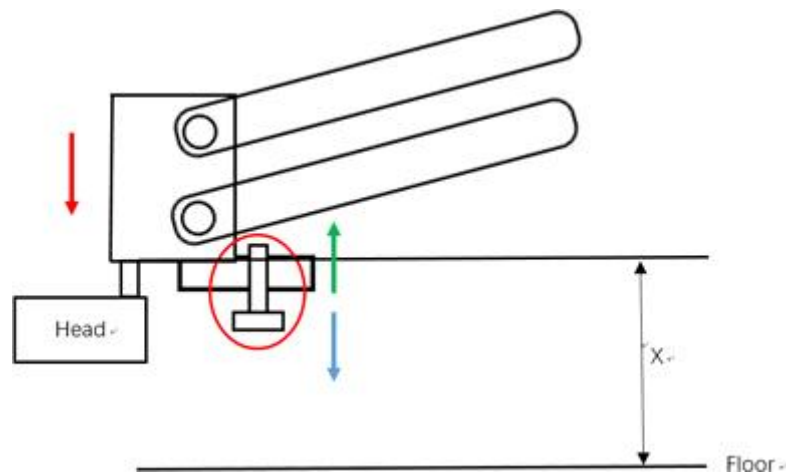
To release the 3 magnetic brakes before setting the balancing system of the balancing arm. On the OMS3200 and OMS3200 R2 models, this switch is located at the front of the second arm [1]. On the OMS3200 Pro models, this switch is located at the end of the first arm [3]



The turn-on time of this switch cannot exceed 2 minutes. If the alarm sounds, please press the switch to turn it off and wait 3 minutes before turning it on again.

Lower limit screw [2]

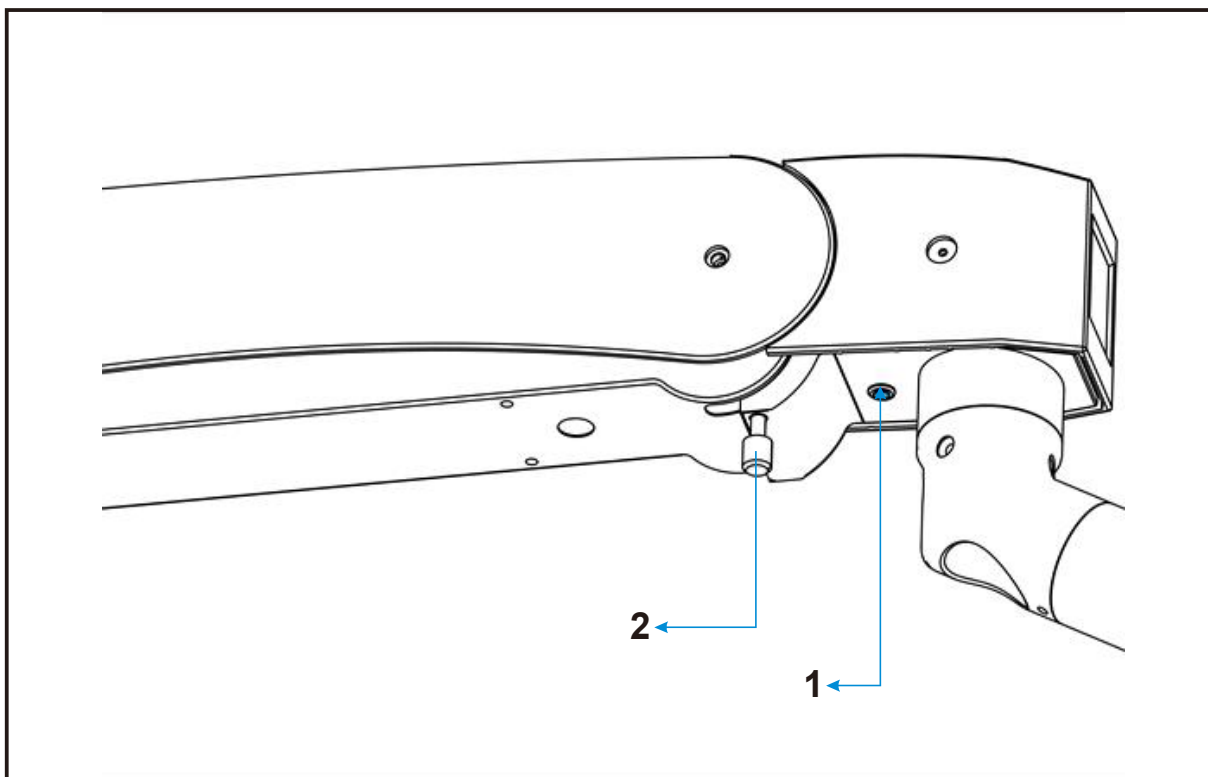
The minimum limit of the second arm can be set according to the needs of operator.



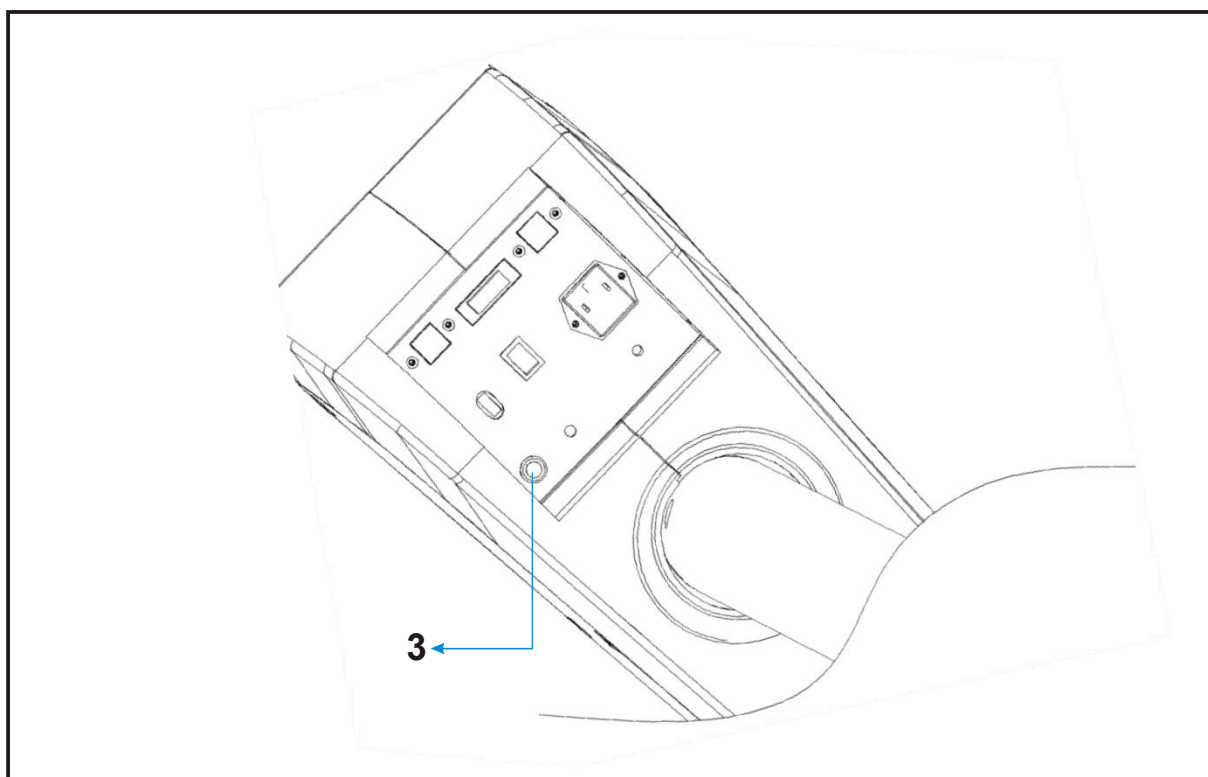
The red circle in the picture is a limit screw. When the gas spring of the second arm fails or the balance adjustment is not performed, the microscope will drop when it is started (red arrow direction), which acts as a limit (to prevent damage to the patient).

► When the screw rotates clockwise (in the direction of the green arrow), the maximum distance X from the lower limit to the ground increases.

► When the screw is turned counterclockwise (in the direction of the blue arrow), the maximum distance X from the lower limit to the ground decreases.



OMS3200/OMS3200 R2



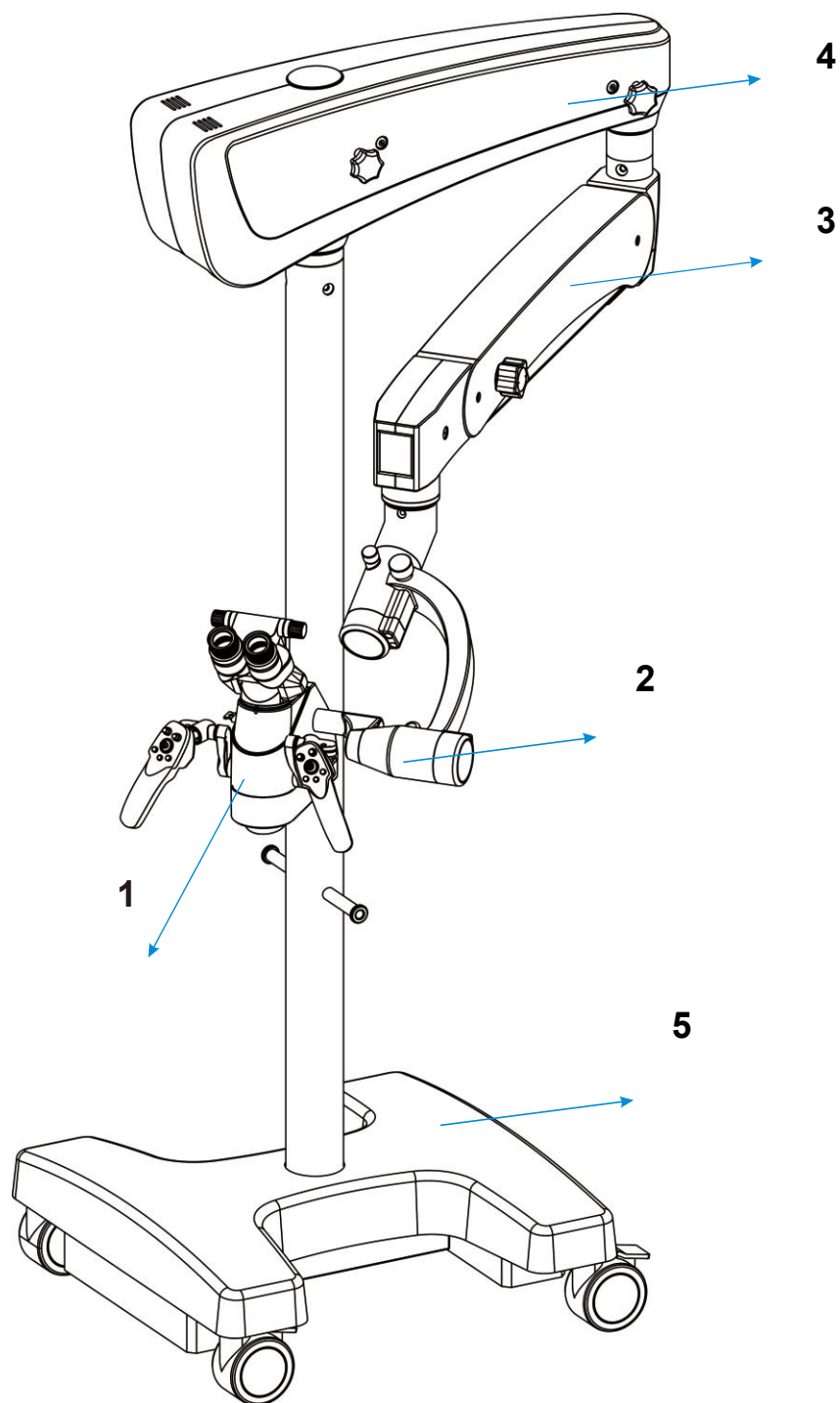
OMS3200 Pro

System Structure

Floor stand

OMS3200, OMS3200 R2 and OMS3200 Pro surgical microscope with the microscope main body, the first arm, the second arm, the magnetic brake arm and the base with casters. The microscope can be easily moved in the operating room.

1. Microscope main body
2. Magnetic balancing arm
3. Second arm
4. First arm
5. Base with casters

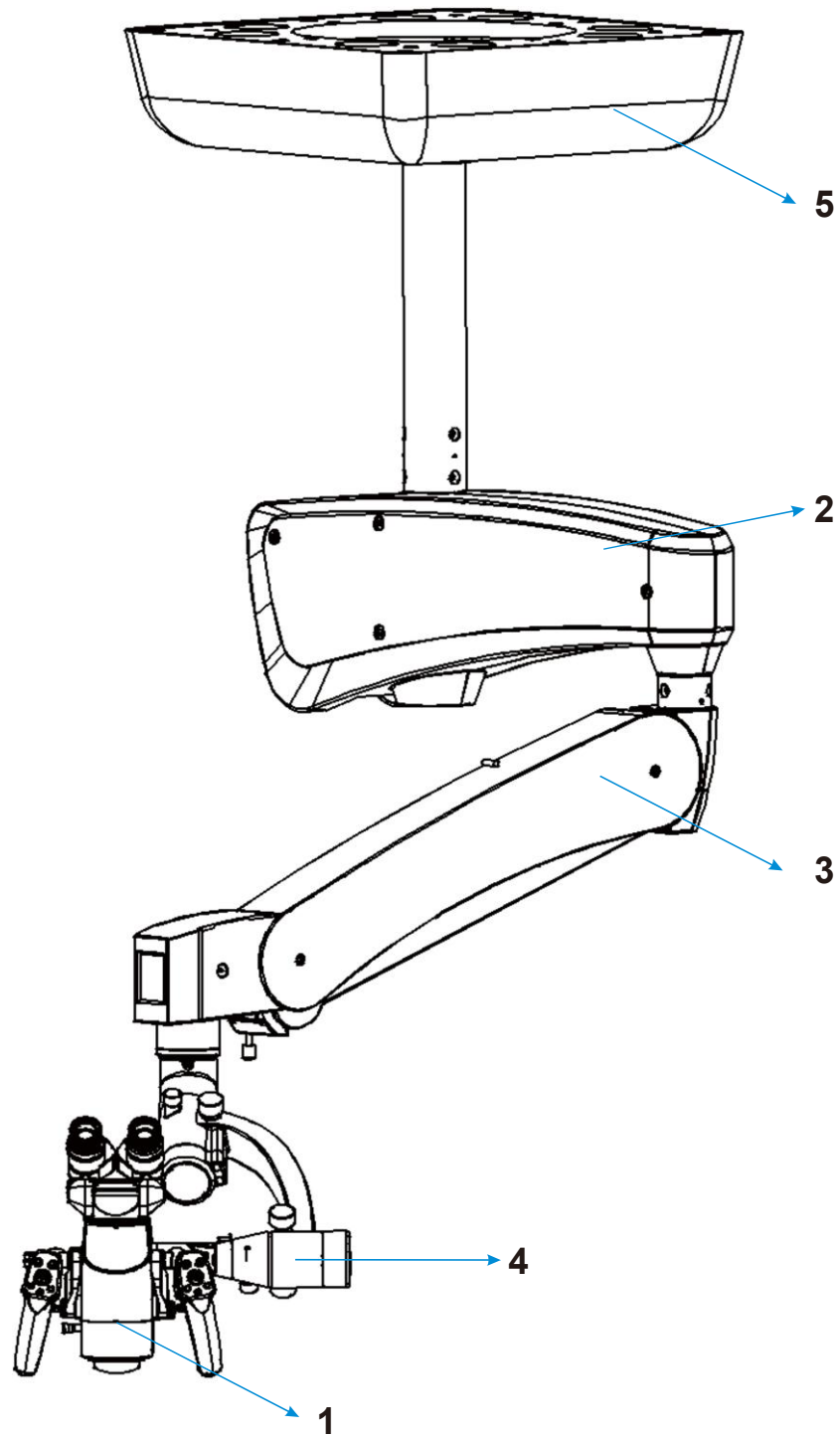


Ceiling mount

OMS3200, OMS3200 R2 and OMS3200 Pro surgical microscope with the microscope main body, the first arm, the second arm, the magnetic brake arm and the ceiling mount components. This installation method will make the room look clean and tidy without being restricted by space.

1. Microscope main body
2. First arm
3. Second arm
4. Magnetic balancing arm
5. Ceiling mount components

Different types of ceiling components have different appearance, size and weight.

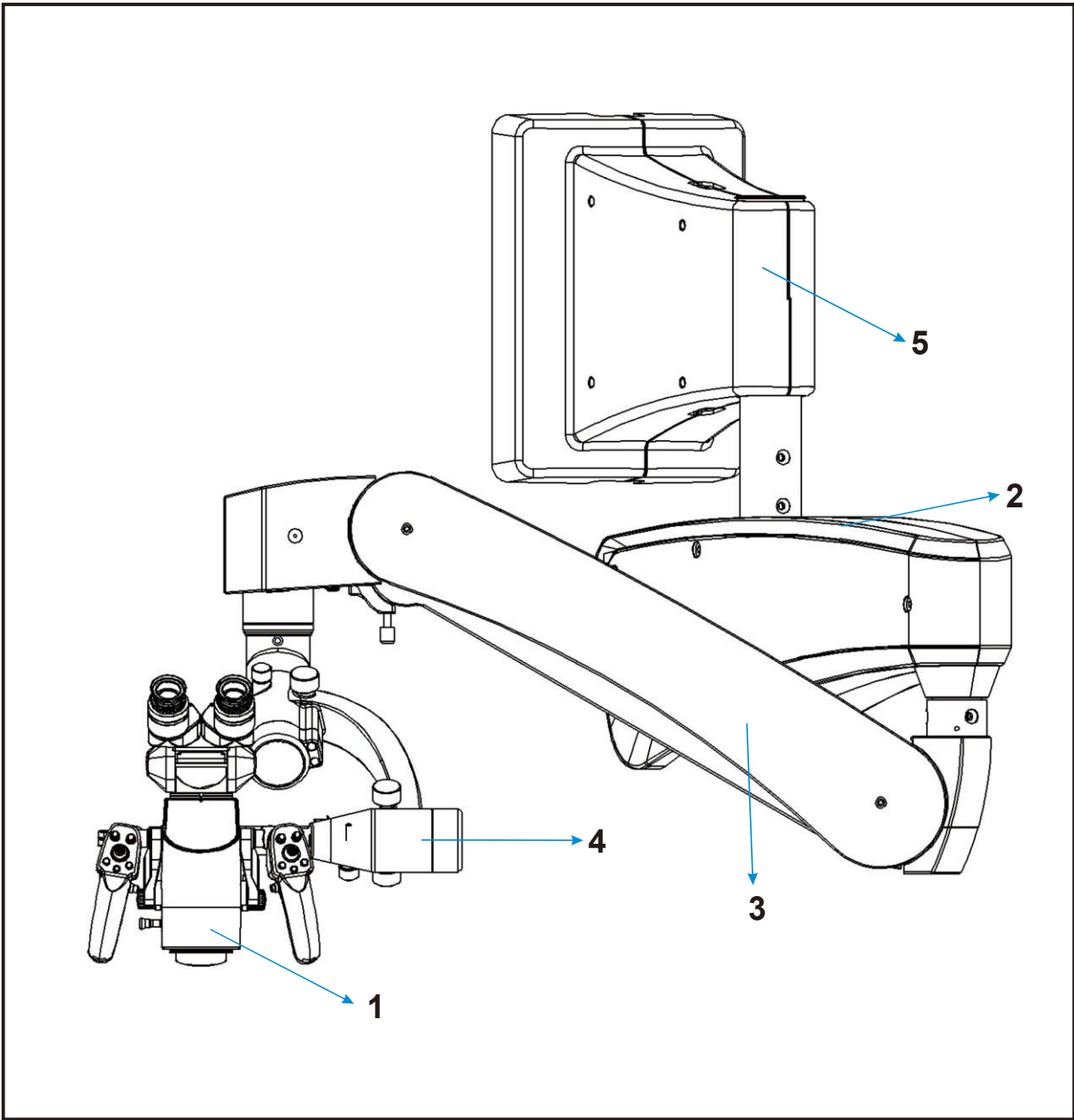


Wall mount

OMS3200, OMS3200 R2 and OMS3200 Pro surgical microscope with the microscope main body, the first arm, the second arm, the magnetic brake arm and the wall mount components. This installation method will make the room look clean and tidy without being restricted by space.

1. Microscope main body
2. First arm
3. Second arm
4. Magnetic balancing arm
5. Wall mount components

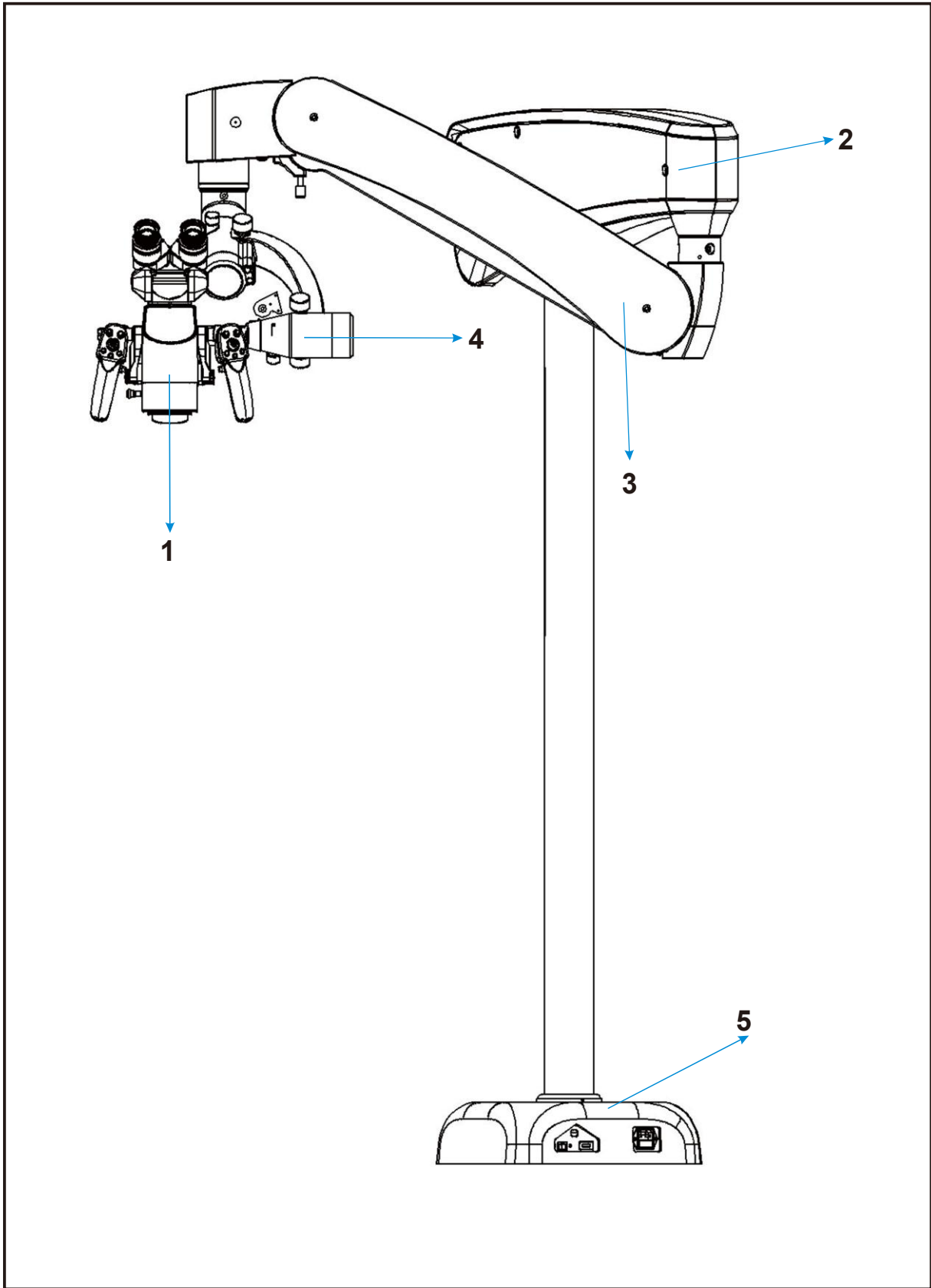
Different types of wall components have different appearance, size and weight.



Fixed ground

OMS3200, OMS3200 R2 and OMS3200 Pro surgical microscope with the microscope main body, the first arm, the second arm, the magnetic brake arm and the fixed ground components. This installation method is very suitable for clinics with a relatively small room area.

1. Microscope main body
2. First arm
3. Second arm
4. Magnetic balancing arm
5. Fixed ground components



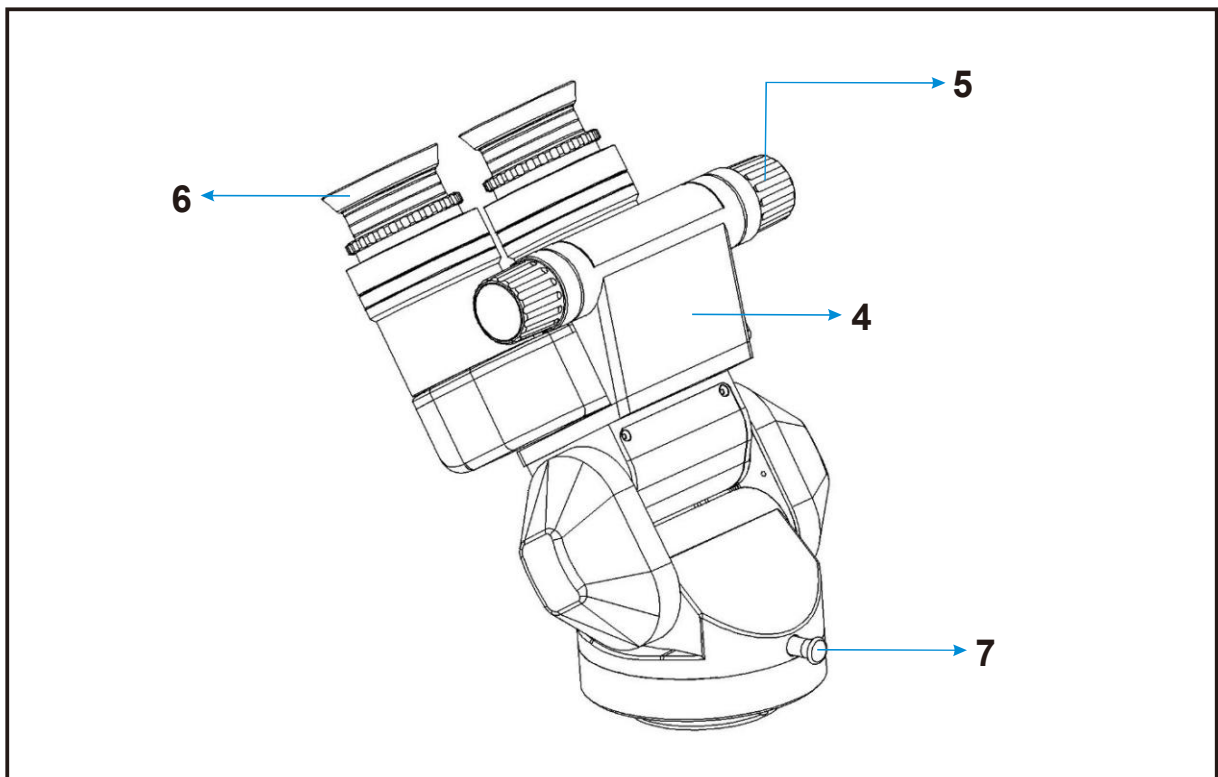
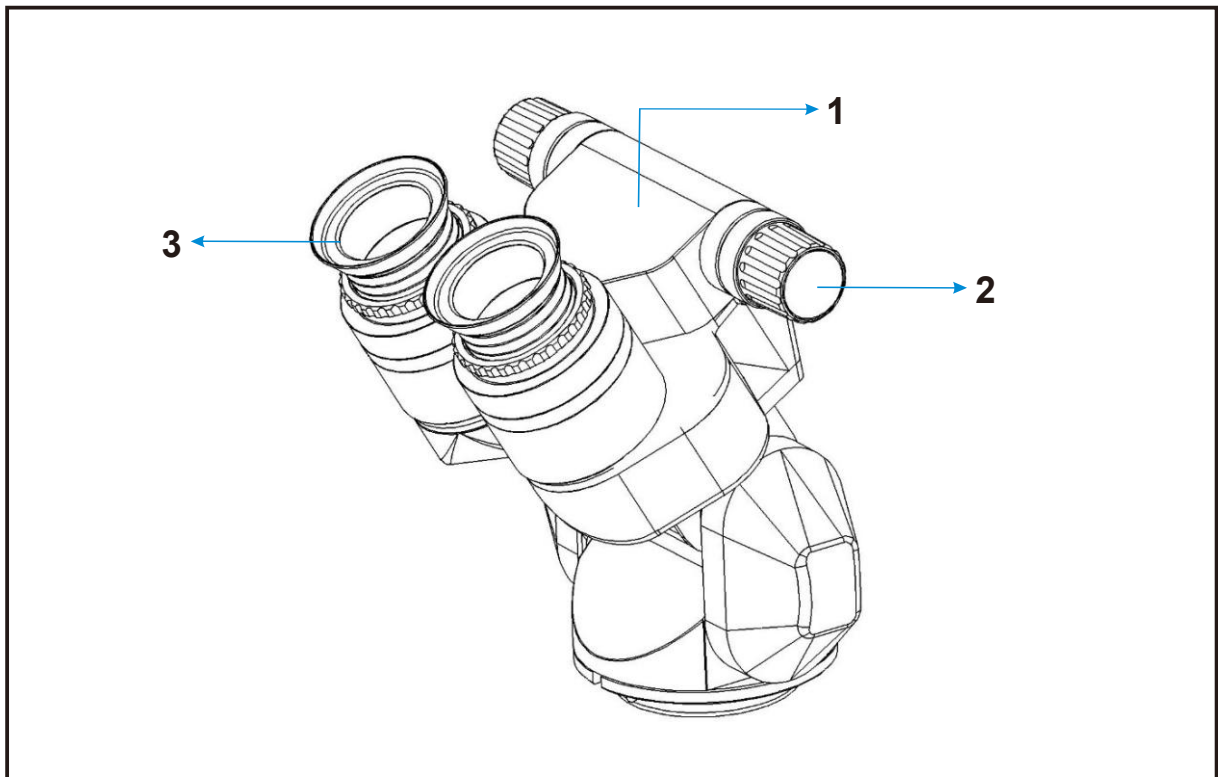
Binocular tube with eyepieces

0° -180° inclinable binocular tube

1. 0° -180° inclinable tube, $f=170\text{mm}$
2. PD adjusting knob
Adjustable range of pupil distance is between 55mm to 75mm.
3. Eyepieces
Magnification of eyepieces is 12.5x/17.7B, adjustable diopter is $\pm 7\text{D}$.

MagPlus 1.5™ 0° -180° inclinable binocular tube(optional)

4. MagPlus 1.5™ 0° -180° inclinable tube, $f=170\text{mm}/f=250\text{mm}$
5. PD adjusting knob
Adjustable range of pupil distance is between 55mm to 75mm.
6. Eyepieces
Magnification of eyepieces is 12.5x/17.7B, adjustable diopter is $\pm 7\text{D}$.
7. f170mm and f250mm switchable lever.



Microscope main body

1. Video interface

2. Light source power supply interface

3. Integrated laser filter (optional and available on OMS3200 R2 and OMS3200 Pro models only).

4. Fixation knobs

After adjusting the proper position of the handle, lock and fix the position of the handles.

5. Integrated filters switch knob

Rotate this knob to select large spot, small spot, micro spot, yellow filter, green filter and anti-reflect module (anti-reflect module is optional, only available on OMS3200 R2 and OMS3200 Pro models).

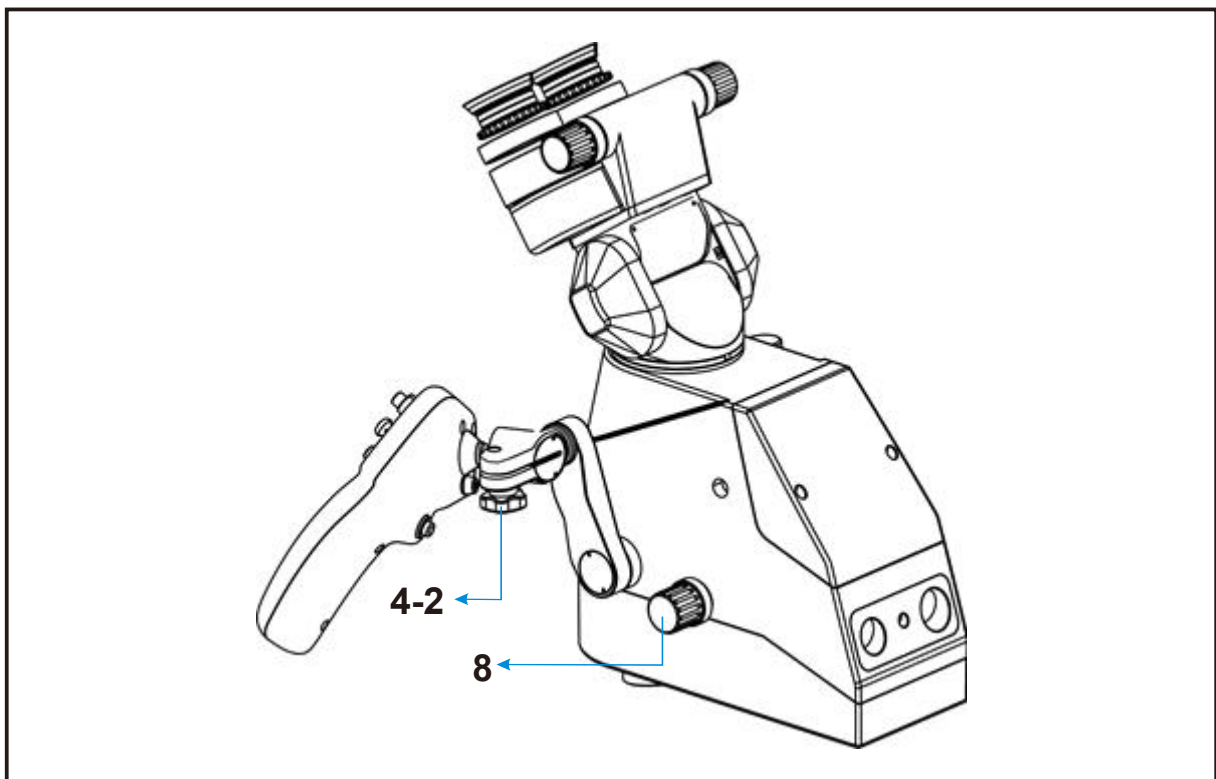
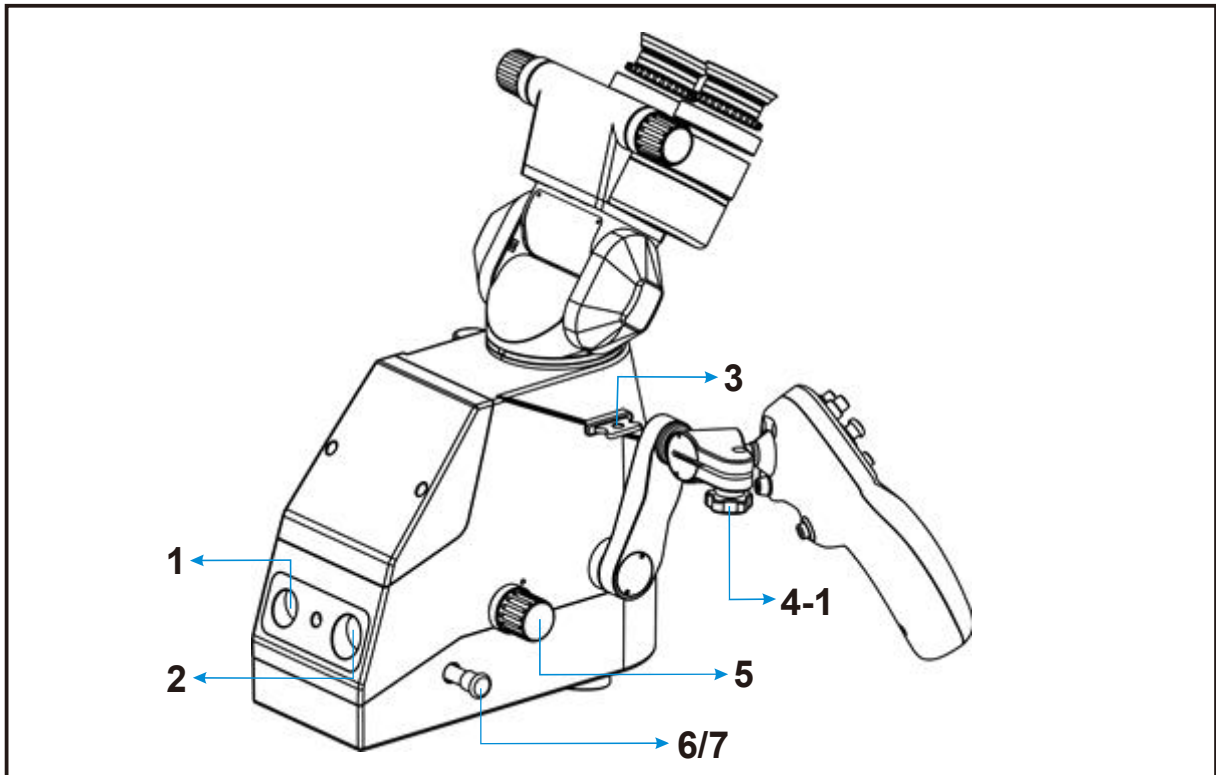
6. Twin switchable light source

7. Fluorescent switch changeable knob (optional)

Used to switch between normal LED light source and fluorescent light source.

8. Focus knob

Use this knob to manually adjust the focal length, focusing range is between 200mm-450mm.



9. Photo/video button

Short press the button once to take a picture, long press once to take a video, press again to exit the video recording.

10. LED light switch

This is a multi-function button. Short press once to control the light source on and off. Long press this button once, the value on the display will be displayed as 1.5 times the result, but this must be used with MagPlus1.5™ 0°-180° inclinable binocular tube and turn on the switch on the tube.

11. Joy stick

Push up is to increase the magnification

Push down is to reduce the magnification

Push left and right to adjust the fine focus

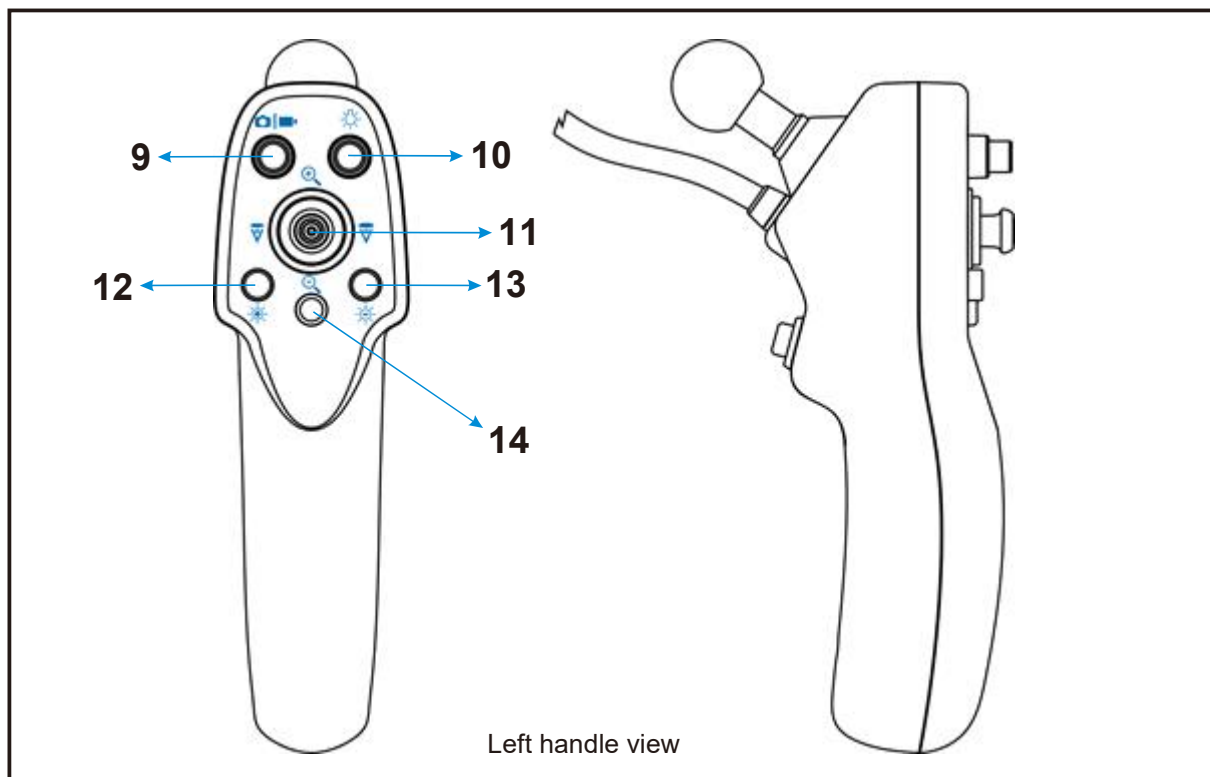
12.13. Light intensity adjusting knob

14. Focus speed switch

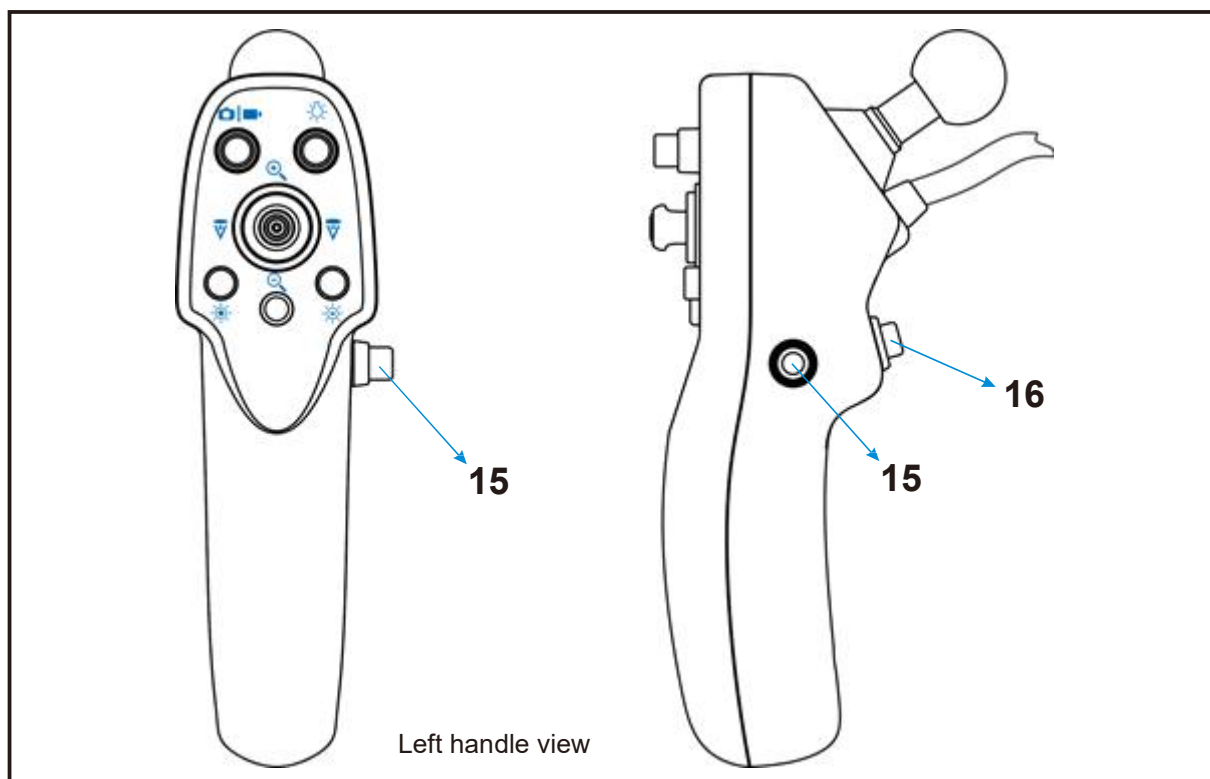
Long press this button, will turn on the motor high speed, an icon will appear on the LED display panel

15. Electromagnetic lock switch for magnetic balance arm and first arm (only available on OMS3200 Pro models).

16. Electromagnetic lock switch for magnetic balance arm



OMS3200/OMS3200 R2



OMS3200 Pro

LCD display panel

1. WD: Working distance, range 200mm-450mm

2. ZM: Zoom magnification, range 0.4x-2.4x

3. MF: Magnification factor, range 1.8x-19.4x

4. MS: Magnification scale

For this function, you need to order a 12.5X eyepiece with target reticle separately, use the following formula to get the result:

Reticle space x Measurement scale=Objective real length

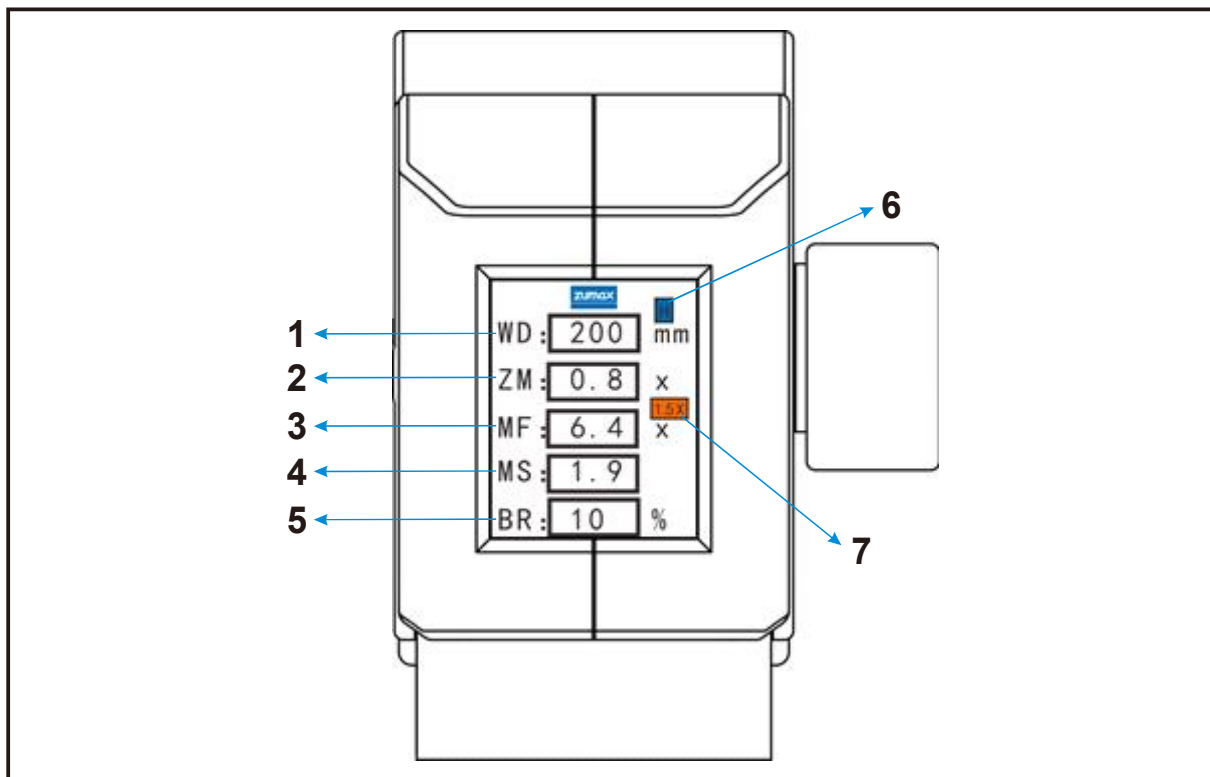
5. BR: Brightness

Brightness percentage display, range 1%, 2%,5%,10%...100%

6. Motor high speed display icon

7. MagPlus 1.5TM Calculation icon

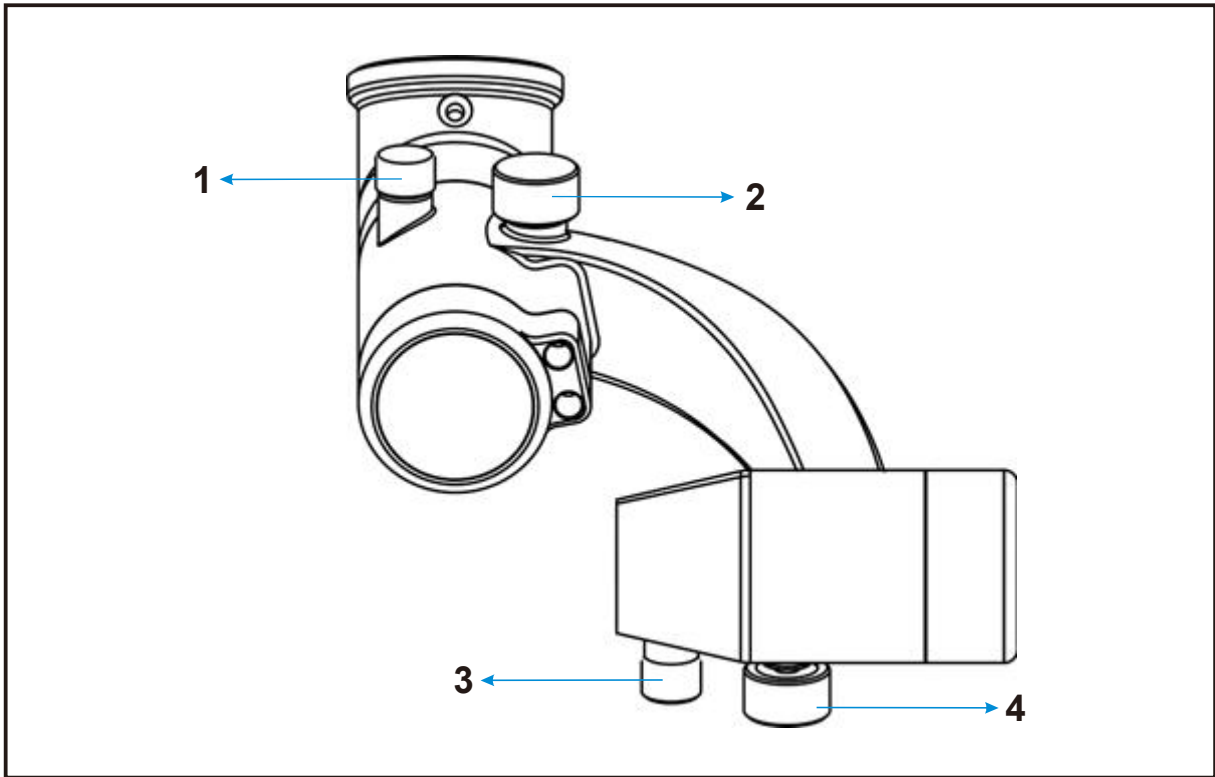
Long press LED light switch once, the value on the display will be displayed as 1.5 times the result, but this must be used with MagPlus1.5TM 0°-180° inclinable binocular tube and turn on the switch on the tube.



Magnetic balancing arm

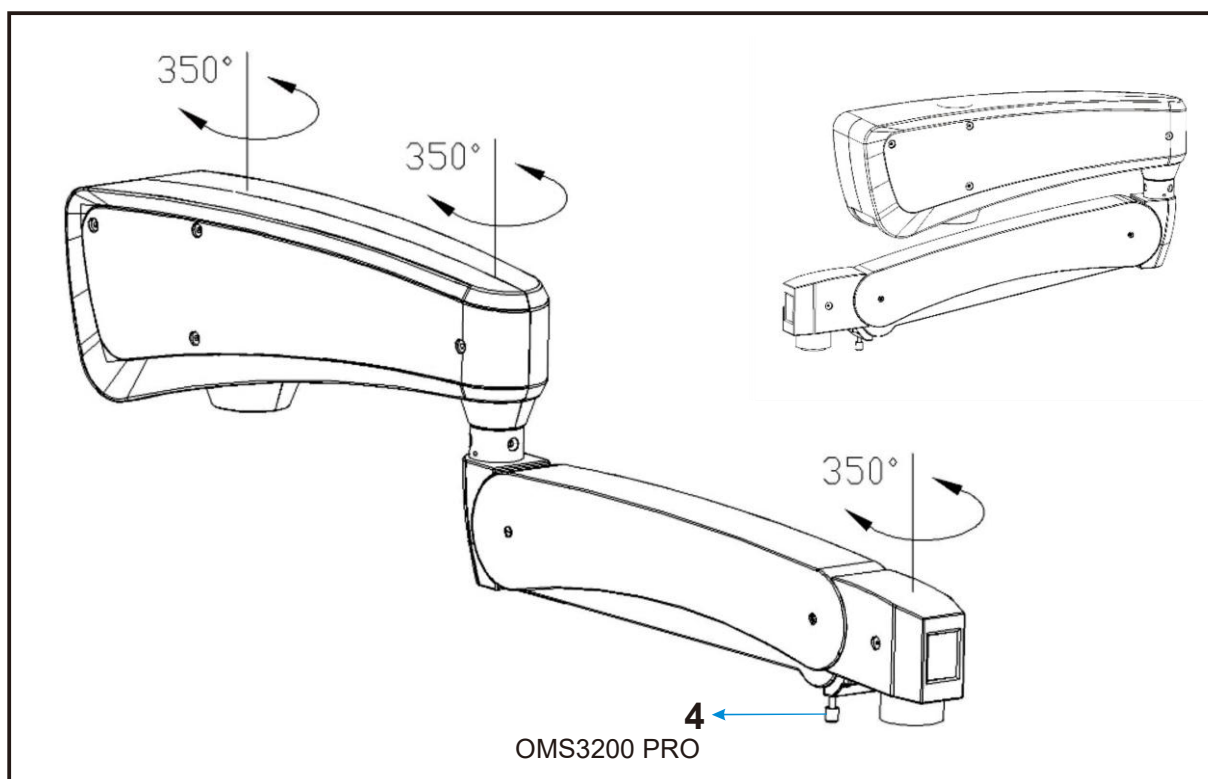
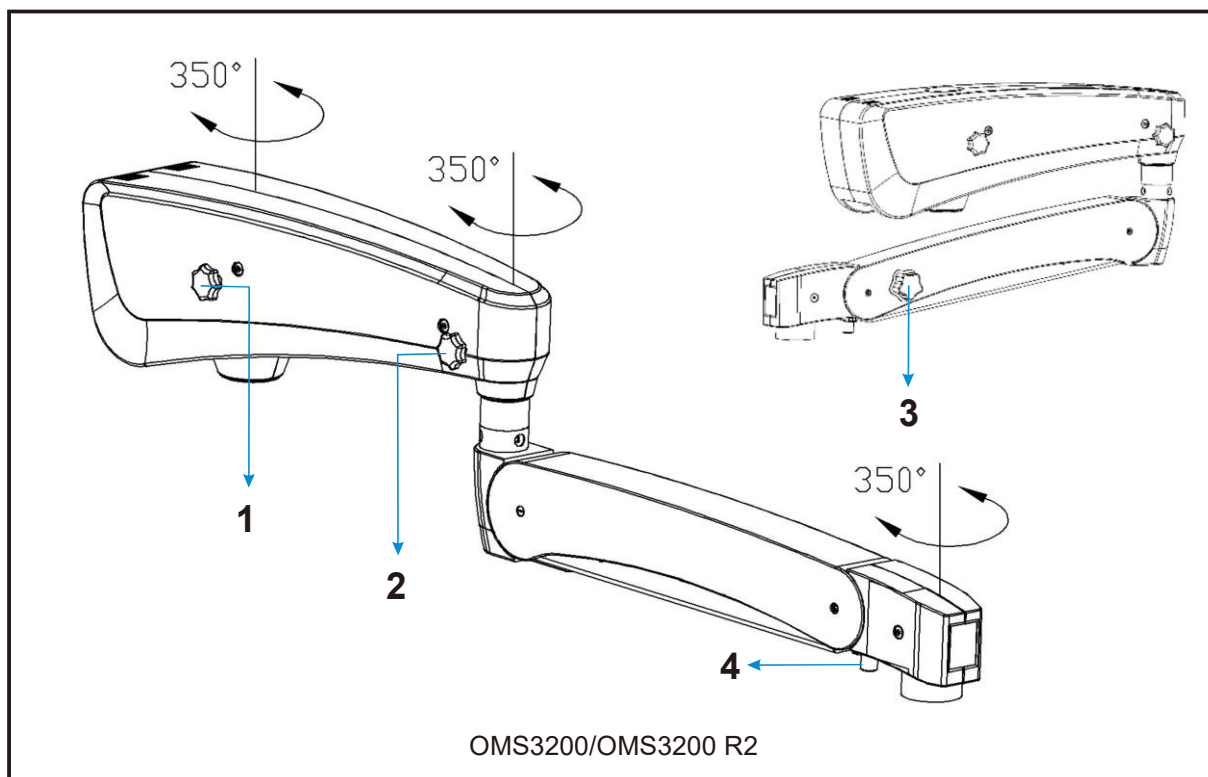
The balancing arm is controlled by 3 electromagnetic locks. The unlock button is on the two control handles. Press and hold one of the buttons to unlock. The balancing arm can move freely. Release the button then the balance arm will be locked instantly

1. Friction knob
2. Balancing knob
Used to adjust left and right balance
3. Friction knob
4. Balancing knob
Used to adjust front and rear balance



First arm and second arm

1. Fixation screw (available on OMS3200/OMS3200 R2 only)
Use this screw to adjust the damping of the horizontal movement of the first arm.
2. Fixation screw (available on OMS3200/OMS3200 R2 only)
Use this screw to adjust the damping of the horizontal movement of the second arm.
3. Fixation screw (available on OMS3200/OMS3200 R2 only)
Use this screw to adjust the vertical moving balance on the second arm.
4. Lower limit screw
The minimum limit of the second arm can be set according to the needs of operator.



Illumination system

OMS3200, OMS3200 R2 and OMS3200 Pro surgical microscope use integrated LED light module which direct the light from the microscope head.

1. Integrated LED module

The OMS3200, OMS3200 R2 and OMS3200 PRO microscopes are already equipped with twin-light sources as standard.

2. Fluorescent light module (optional)

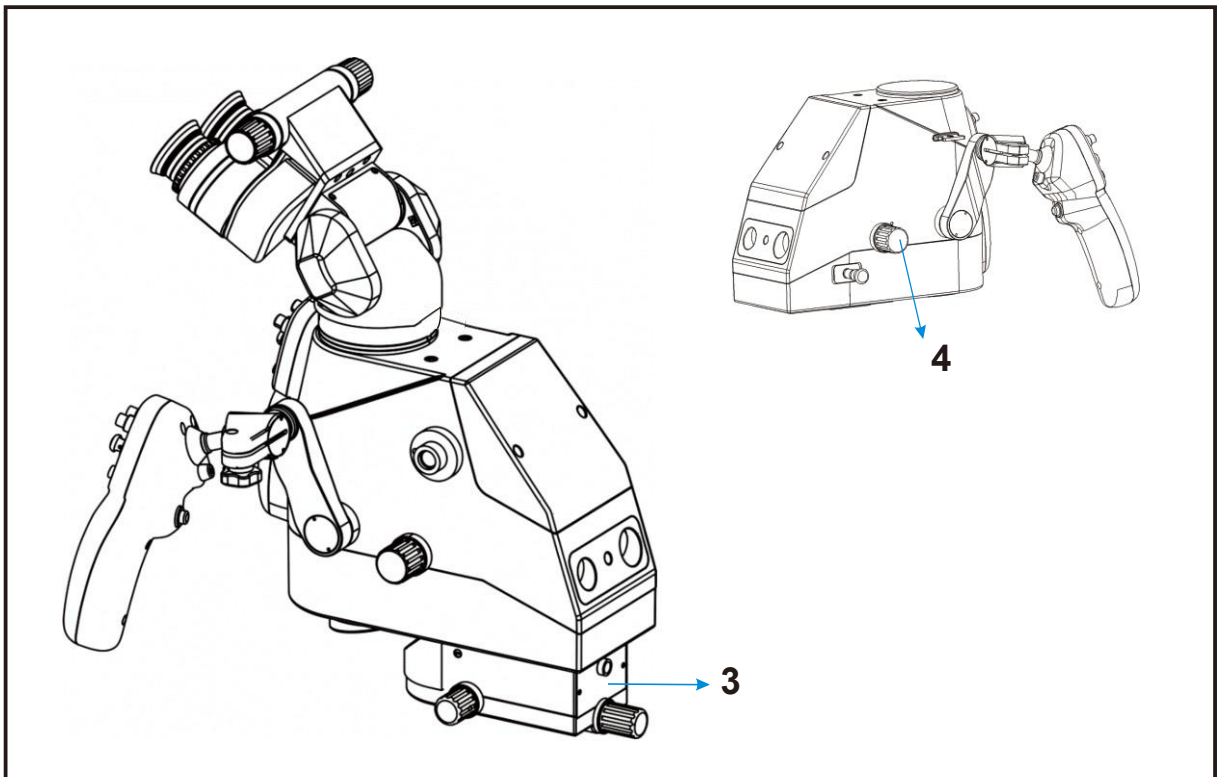
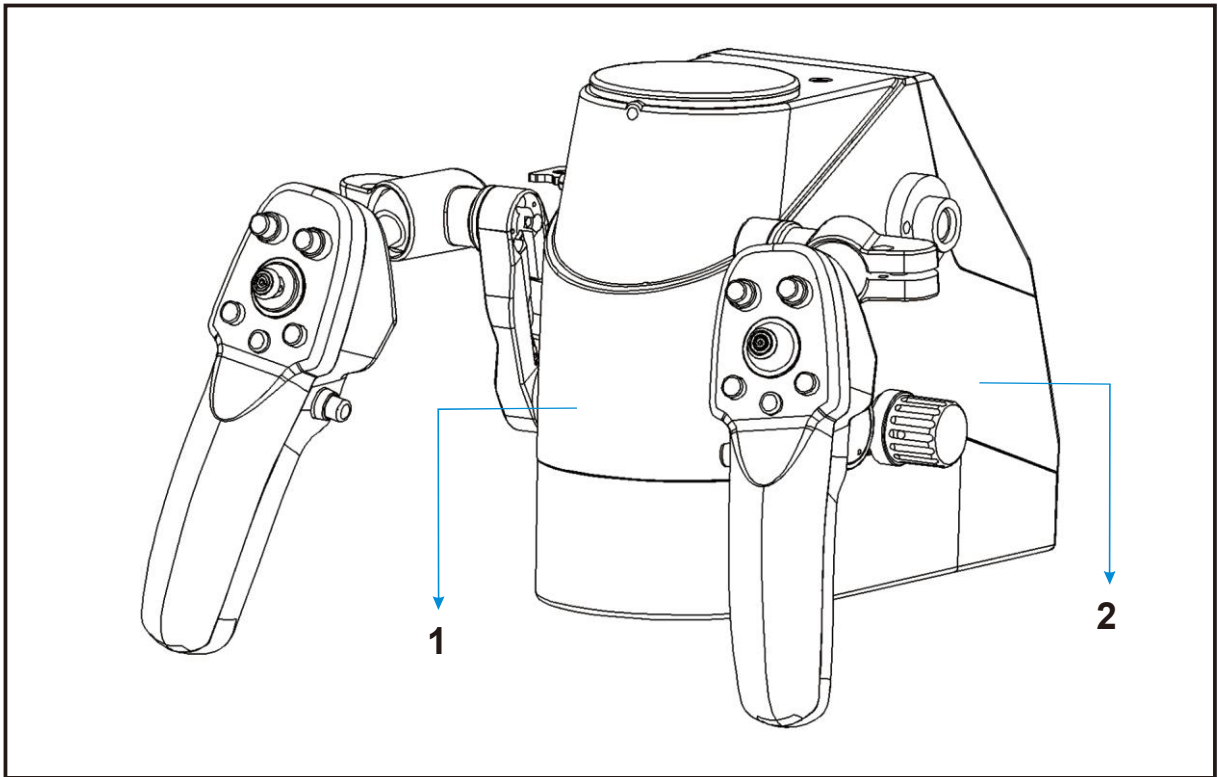
If you choose a twin-light source, you can't add a fluorescent module. If you choose a fluorescent module, there is no twin-light module, you can only choose one.

3. Secondary lighting (optional)

It's only available on OMS3200 R2 and OMS3200 PRO microscopes, the illuminance can reach up to 210,000 LUX after add the secondary lighting at the working distance 250mm.

4. Anti-reflect module (optional)

It's only available on OMS3200 R2 and OMS3200 PRO microscopes. Anti-reflective module, when measuring some objects with smooth surfaces or reflective effects, the surface of the object will have a certain specular reflection effect on the illumination light, and the reflected light will be directly received by the human eye or imaging device, and then it will be in the image. A very bright spot appears during the process, which adversely affects the observation effect. At this time, it is necessary to add polarizers with different directions in the illumination light path and the observation light path to filter out the strong interference light reflected by the mirror.



Magnification system

1. Eyepieces

The OMS3200, OMS3200 R2 and OMS3200 PRO microscopes are equipped with 12.5X eyepieces as standard.

2. Motorized zoom magnification changer

The continuously zoom magnification changer is more convenience, faster to adjust the magnification. It can be controlled by the joy sticks on the left or right handle. The working range of the magnification is 1.8x-19.4x.

3. VarioDist objective lens

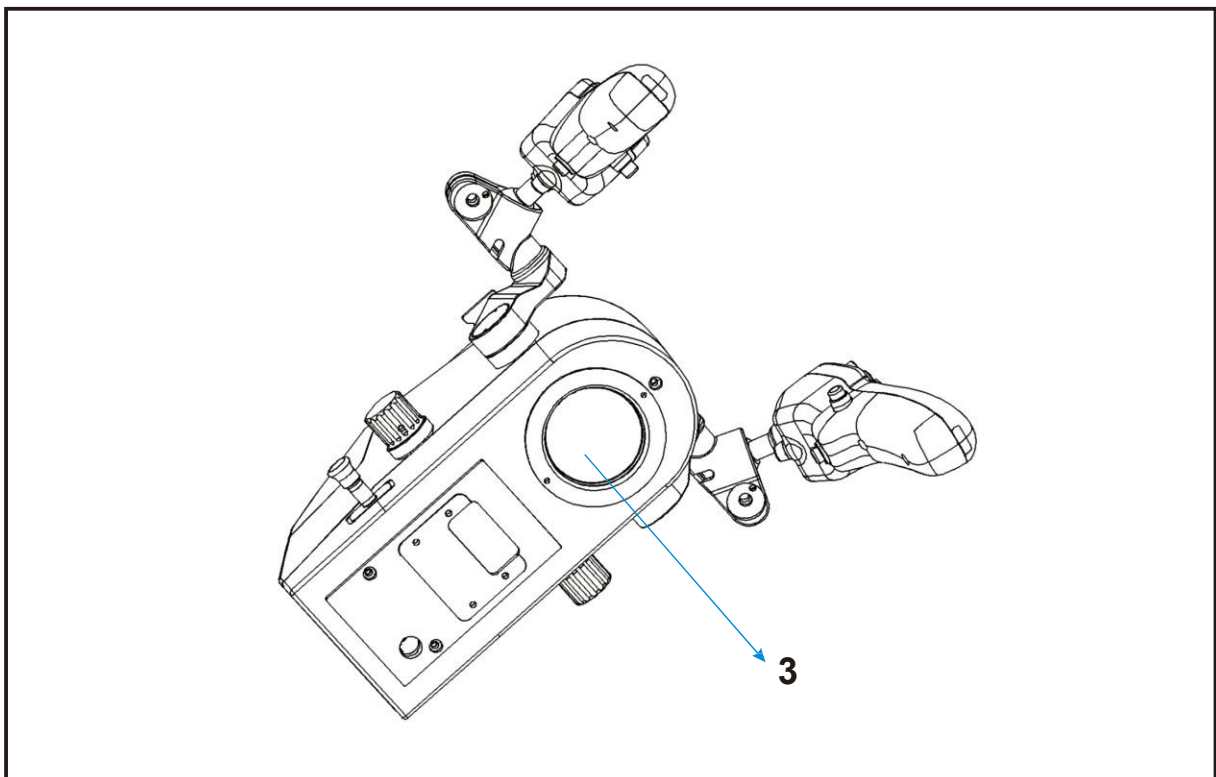
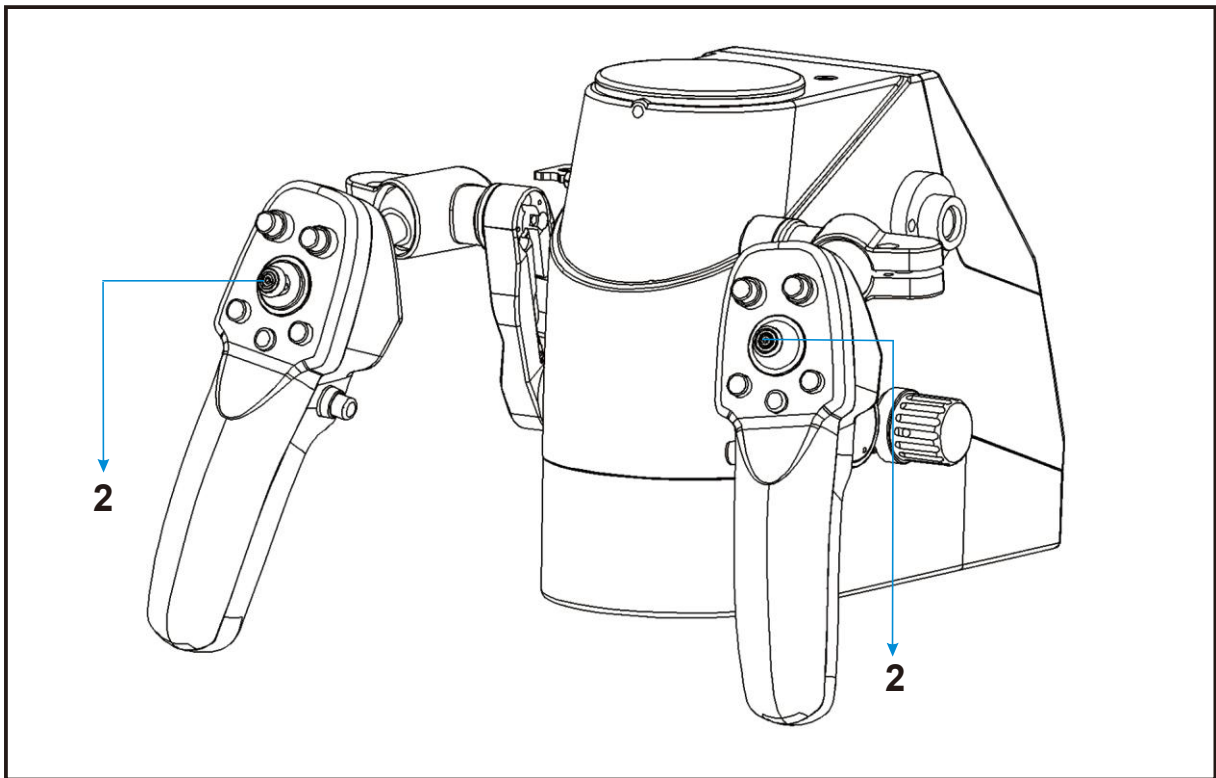
Working range 200mm-450mm.

$$\text{End magnification} = \frac{\text{Tube focal length}}{\text{OB Lens focal length}} \times \text{Magnification changer factor} \times \text{eyepieces factor}$$

Tube focal length: $f=170\text{mm}$, Objective Lens focal length: $f=250\text{mm}$,

Magnification changer factor $0.5x$, Eyepieces factor $12.5x$

$$\frac{170}{250} \times 0.5 \times 12.5 = 4.25 \quad 4.25x \text{ is the magnification in this example}$$



Power and video connections

1. Main power socket and fuse socket

Pull out the power table, right side is fuse socket.

OMS3200 and OMS3200 R2 fuse specification:

100-127 ~50Hz T4 AL250V

220-240 ~60Hz T2.5 AL250V

OMS3200 Pro fuse specification:

100-127 ~50Hz T5 AL250V

220-240 ~60Hz T3.15 AL250V

2. Network port

3. HDMI video output

4. Foot pedal interface

5. SD card socket

6. 110V/220V voltage selector

Pushing the selector upwards converts input voltage is 110V, pushing the selector downwards converts input voltage is 220V.

7. USB socket

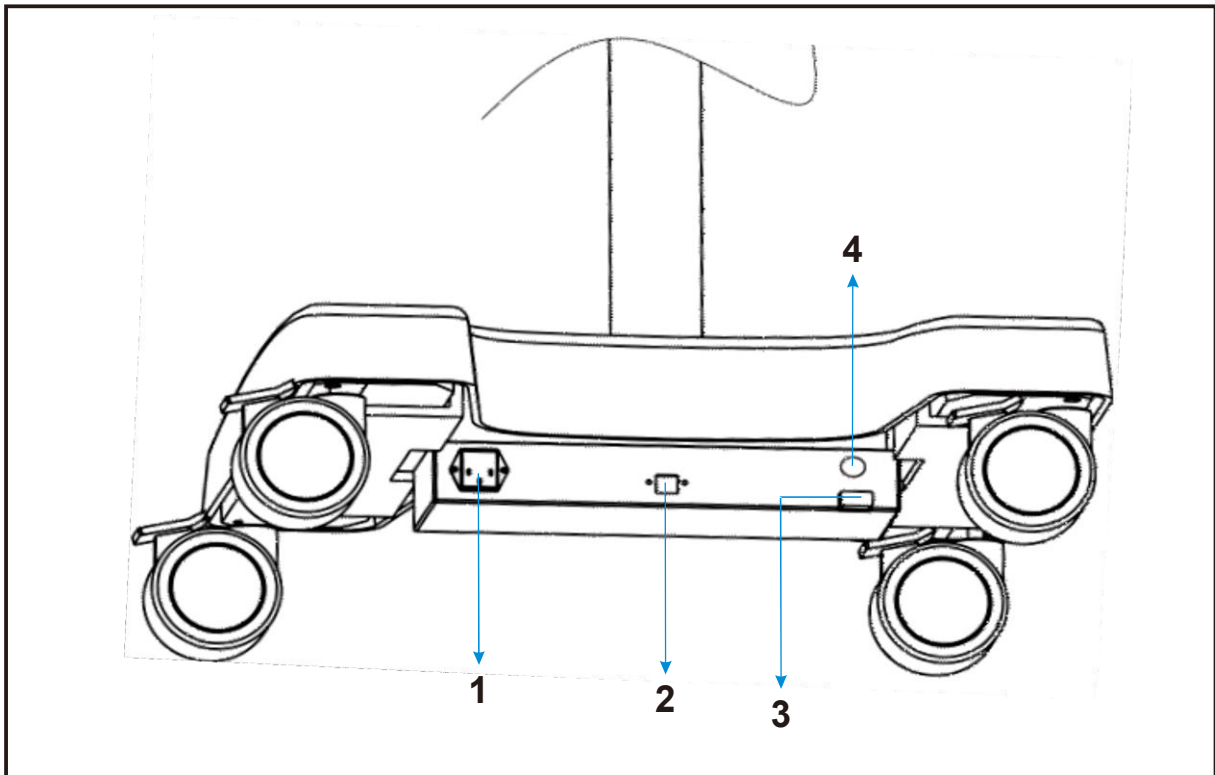
On the OMS3200 model, this socket is used for the receiver of the wireless mouse.

8. Debug interface

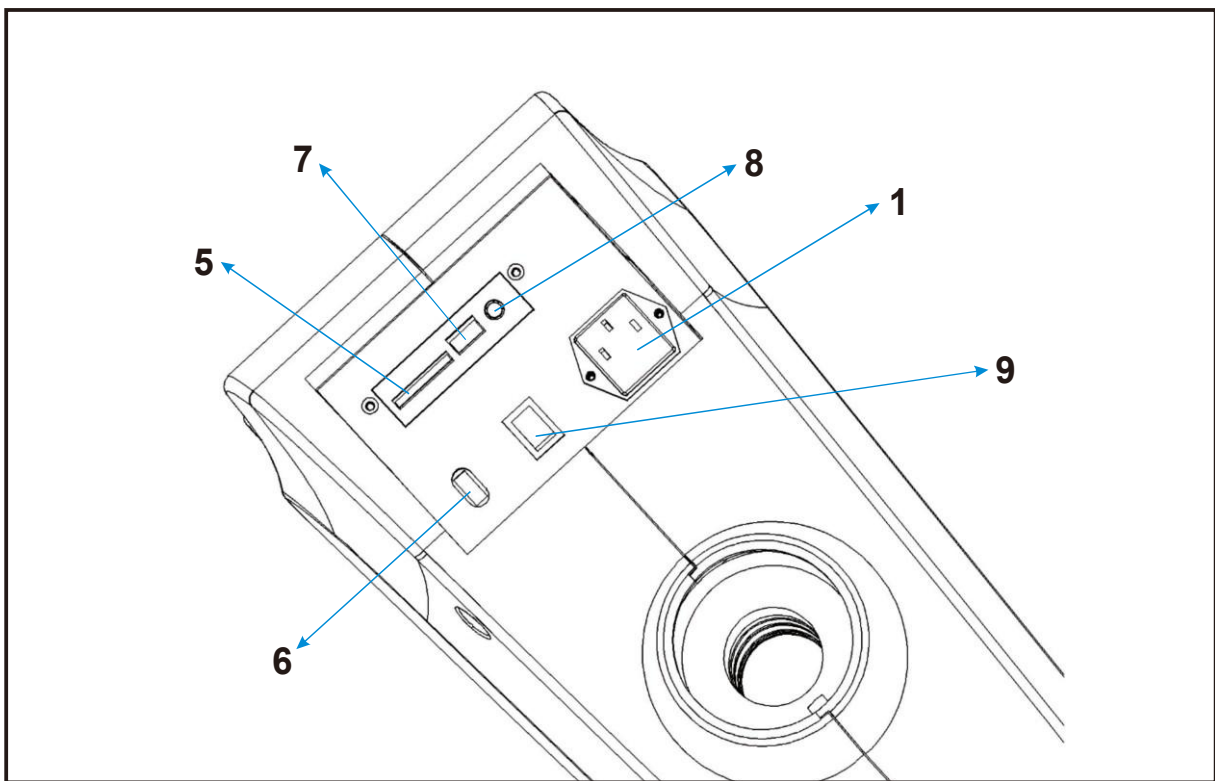
This interface only available on the OMS3200, use to set the parameters of the integrated full HD video image by connecting a remote control.

9. Main power switch

To turn on/turn off the main power of the microscope.



OMS3200/OMS3200 R2/OMS3200 Pro floor stand

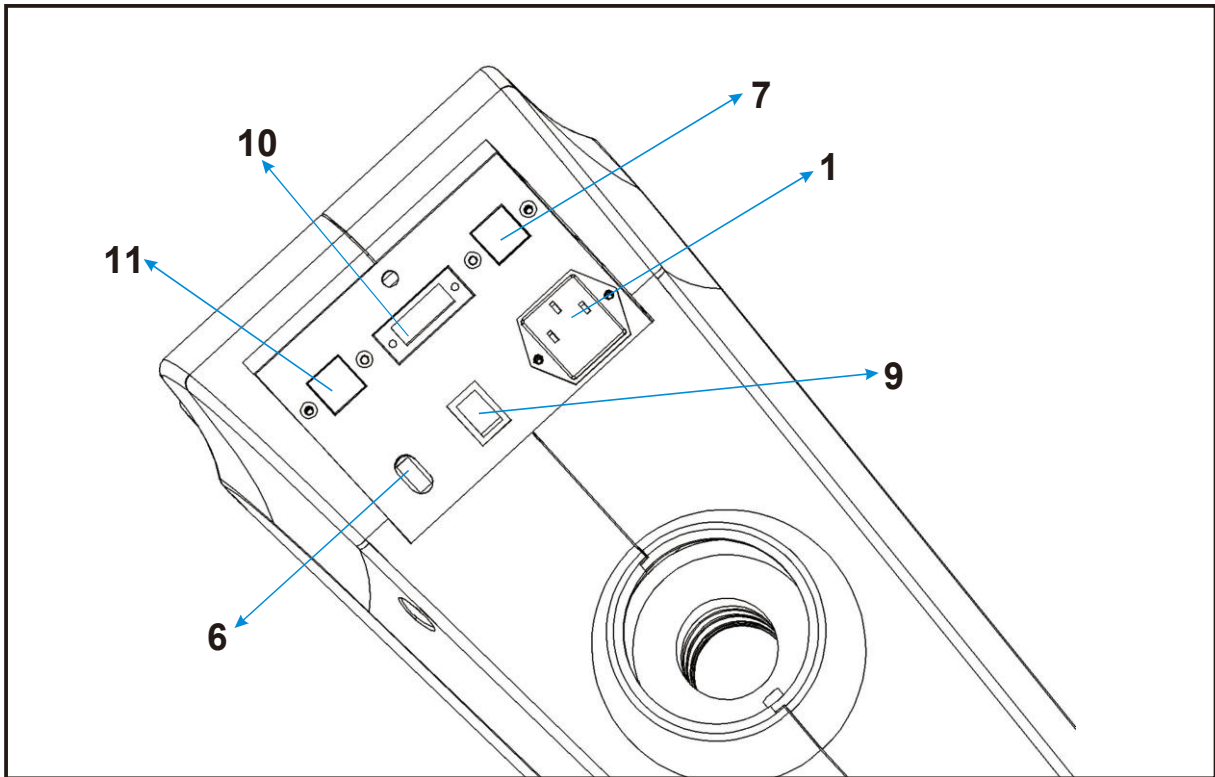


OMS3200 ceiling mount, wall mount

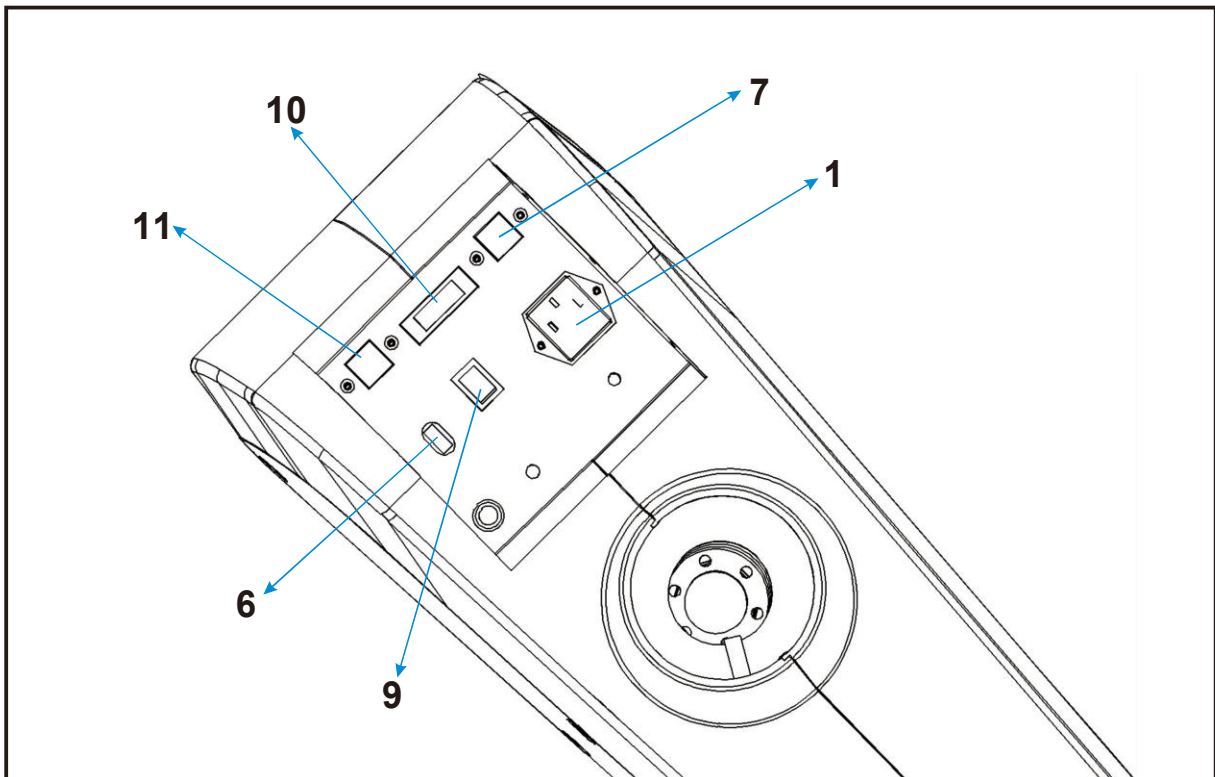
10. DVI output

This output only available on the OMS3200 R2 and OMS3200 Pro which with 4K or 4K-3D camera system. The output from this interface is a high-definition 2D signal.

11. Port of wireless mouse receiver



OMS3200 R2 ceiling mount, wall mount



OMS3200 Pro ceiling mount, wall mount

Preparations for Operate

Adjusting the balance of second arm

- ▶ Hold the second arm, unscrew the fixation screw [1].



Caution: The first arm must be held in the horizontal position.



Caution: The second arm must be held firmly before release the fixation screw [1].



Caution: Please confirm the lower limit screw has been released.

- ▶ Use an 8 mm Allen key into the screw which under the second arm end [2].
- ▶ To balance the second arm, move the arm up and down slightly while tightening the adjusting screw.
- ▶ Continue to tighten the screws until sufficient spring force is obtained to compensate for the weight of the microscope and accessories.



Caution: When you need to move the second arm up and down, the Allen key can't be stayed in the screw hole.

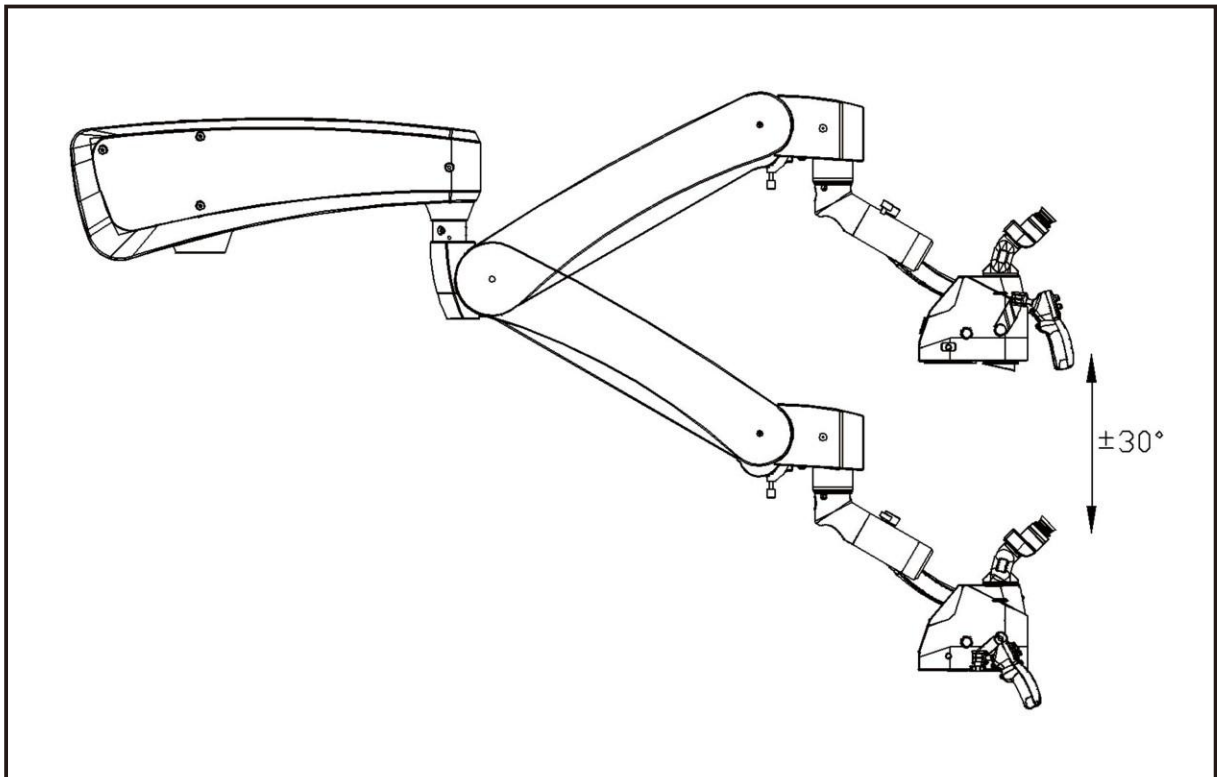
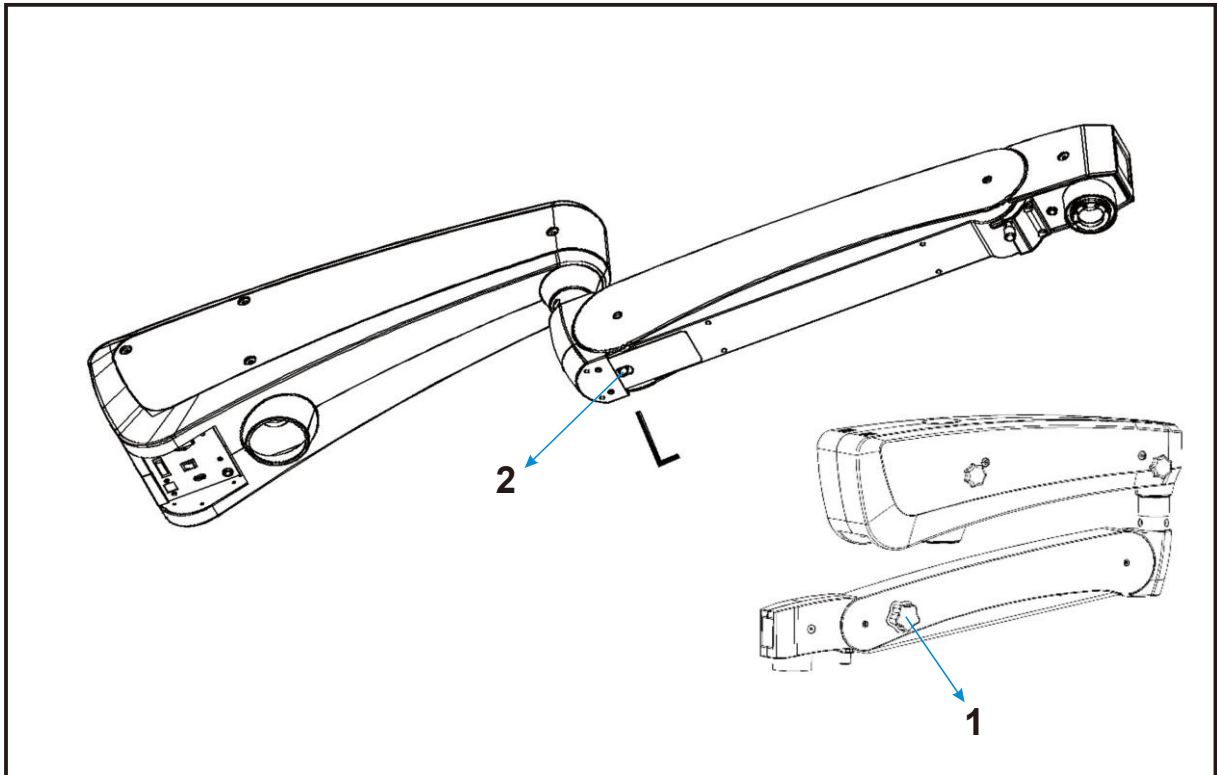


Caution: Clockwise rotation is to increase the pressure of the gas spring, counter clockwise is to release the pressure

- ▶ When adding or removing accessories, readjustment of the balance of the second arm is necessary.
- ▶ The loading weight of the accessories should not exceed the maximum loading weight of the arm, otherwise the gas spring may be damaged.



WARNING: NEVER BALANCE THE MICROSCOPE WHILE THE PATIENT IS UNDER THE MICROSCOPE.

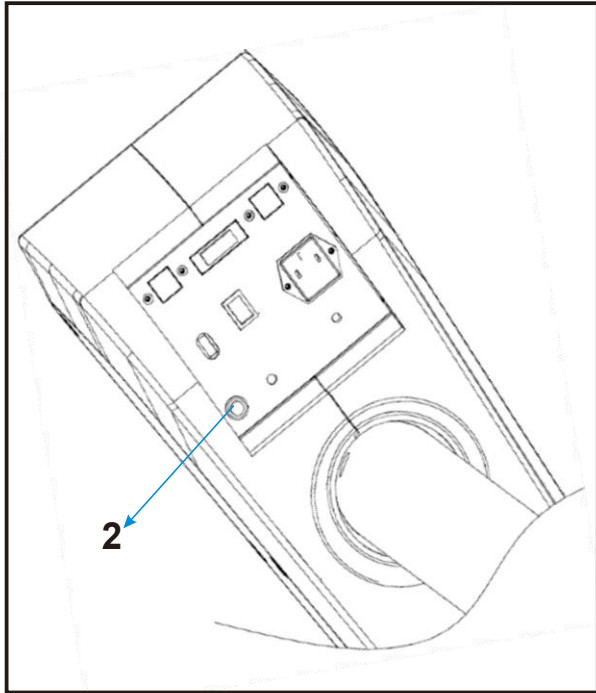
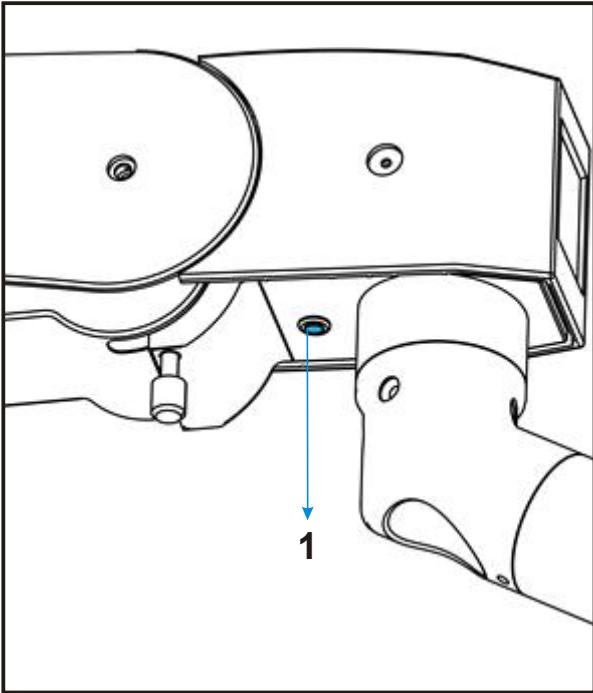
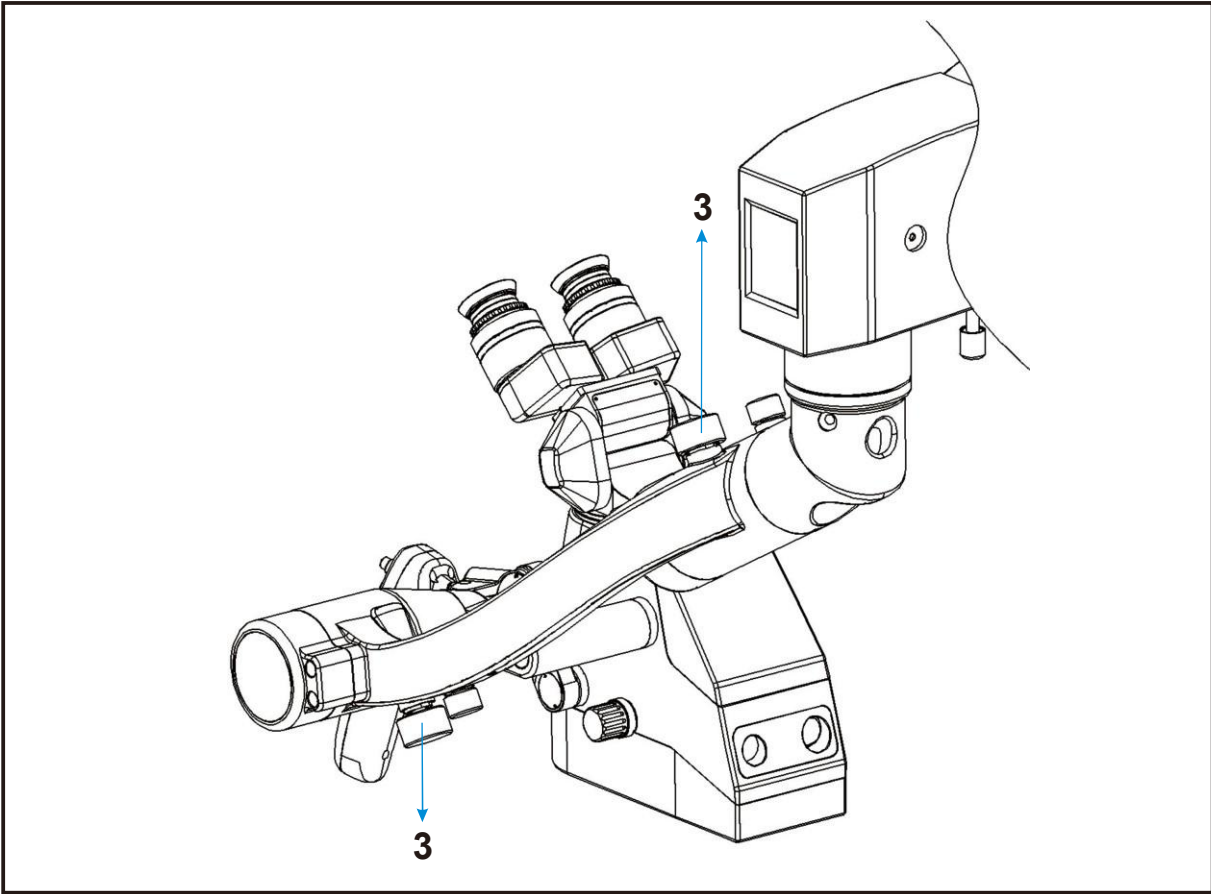


Adjusting the balance of magnetic balancing arm

- ▶ Press the switch [1]/[2] to release the 3 magnetic brakes before setting the balancing system of the balancing arm.
- ▶ Rotate the balancing knob [3] until the head can be stayed at the equilibrium position.
- ▶ After the balance adjustment is completed, you need to press the switch once again [1]/[2].
- ▶ On the OMS3200 and OMS3200 R2 models, this switch is located at the front of the second arm [1]. On the OMS3200 Pro models, this switch is located at the end of the first arm [2]
- ▶ When adding or removing accessories, readjustment of the balance of magnetic balancing arm is necessary.

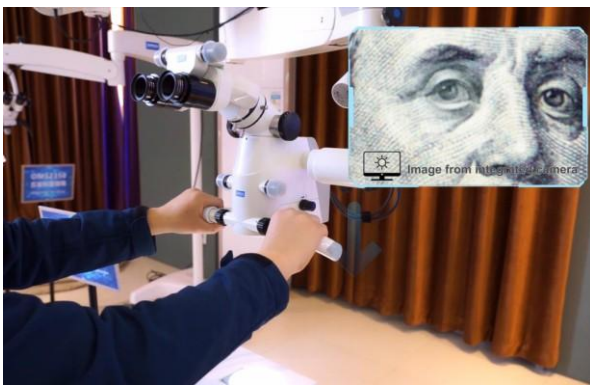


Caution: The turn-on time of this switch [1]/[2] cannot exceed 2 minutes. If the alarm sounds, please press the switch to turn it off and wait 3 minutes before turning it on again.

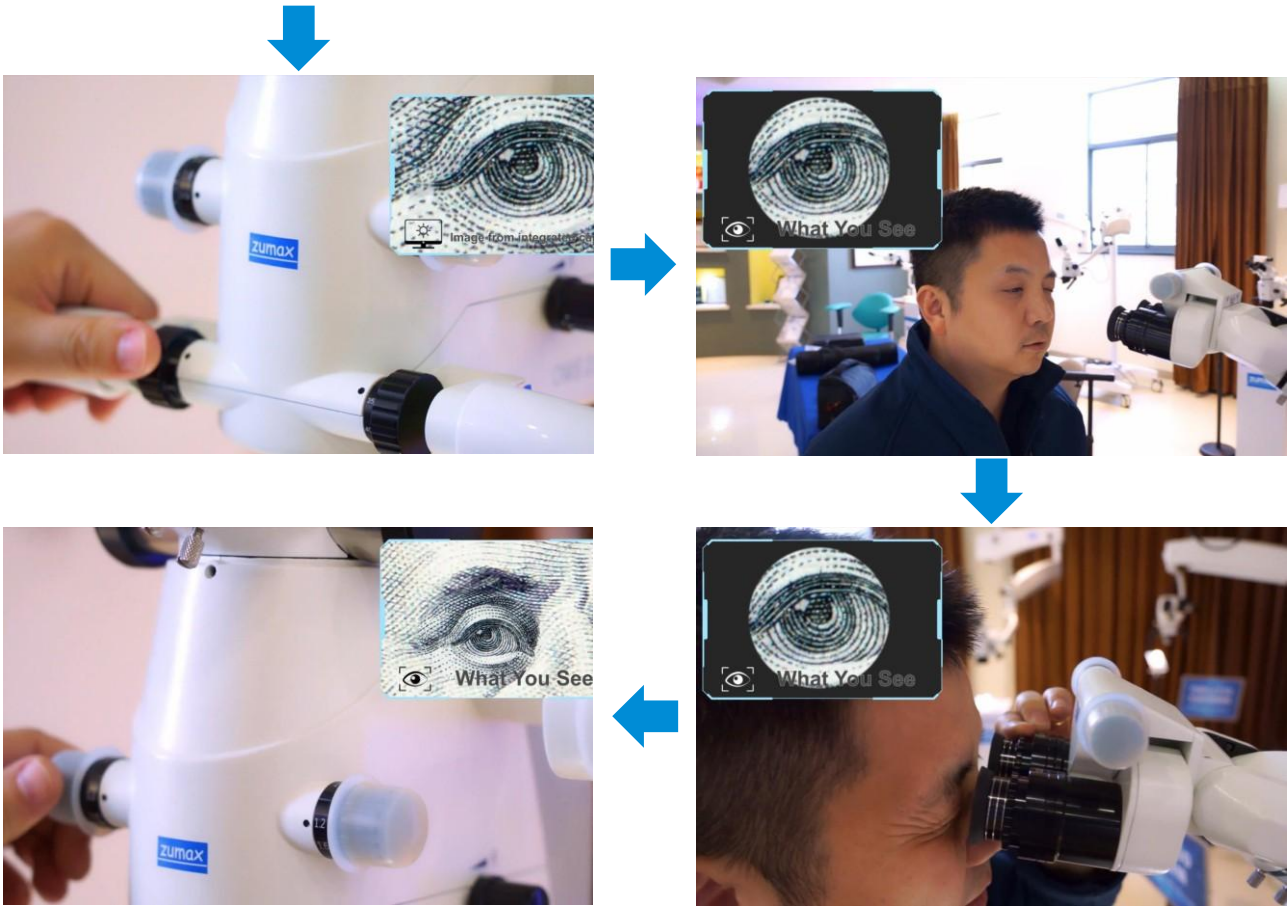


Initial setup of the microscope

1. Put a flat bill under the microscope.
2. Set the magnification changer to the lowest magnification, e.g. 0.3X, in order to maximize the field of view.
3. Set the focal length of VarioDist lens to median. We suggest 250-300mm for the models of OMS3200.
4. Move the microscope up and down for focusing and find the center position of the target on the monitor.
5. Adjust the inter-pupillary distance by PD knob slowly and get the two images into one.
6. Screw in the eyecups until the silver coil is no longer visible if you wear glasses.
Screw out the eyecups with about 2-3 silver coils, if you don't wear glasses.
7. Set the magnification changer to the highest magnification.
8. Adjust the knob of the objective lens until you viewing the most sharpness image on the monitor.
Note: Please do not move your microscope up and down any more after step 8.
9. Close your left eye, adjust the right diopter ring till you view the sharpness image through right eyepiece.



10. Then close your right eye, adjust the left diopter ring till you view the sharpness image through left eyepiece.
11. After the diopters are set, please do not forget to record them so that they can use the microscope in the future and set their own values directly.
12. Set the focal length of VarioDist lens to median again, you will get the most sharpness image through eyepieces now, the image resolution on the monitor and the sharpness observed in the eyepieces are also the same.



Operation of Microscope

Position of the microscope

After finding the basic location of the doctor and patient, the location of the microscope needs to be determined. Usually, the microscope and the ground maintain a vertical angle, some treatment conditions need to change the angle of the microscope.

- ▶ Move the microscope arm up and down to the right working range.
- ▶ Adjust the illumination.
- ▶ Select the filter which will be used.
- ▶ Adjust the magnification



Caution: Please make sure that the light source is not aimed at the patient's eyes.



Caution: Pay attention to the position and the height of the arms, do not hit the assistant or patient.

Using the multi-functional handles

The magnetic brakes provide an easy and precise positioning of the microscope. Just press the buttons on the Multi-functional handles to release handbrakes and bring the microscope in the location required. The buttons on the handle also provide the following operation functions.

- ▶ Photo/Video button
- ▶ LED light switch
- ▶ Joy stick, push up is to increase the magnification, push down is to reduce the magnification, push left and right to adjust the fine focus
- ▶ Light intensity adjusting knob
- ▶ Focus speed switch

Image Storage

The storage media of the model with HD integrated camera is an SD card, and the model with 4K integrated camera uses a U disk.

Press the control button on the handle, the captured pictures or videos will be automatically stored on the SD card or U disk, and then read through the computer.



Caution: SD card speed $\leq$ 100M / S, U disk 3.0.

Light source switching

On the left side of the microscope body, there is a knob [1] for illumination and filter's switching.

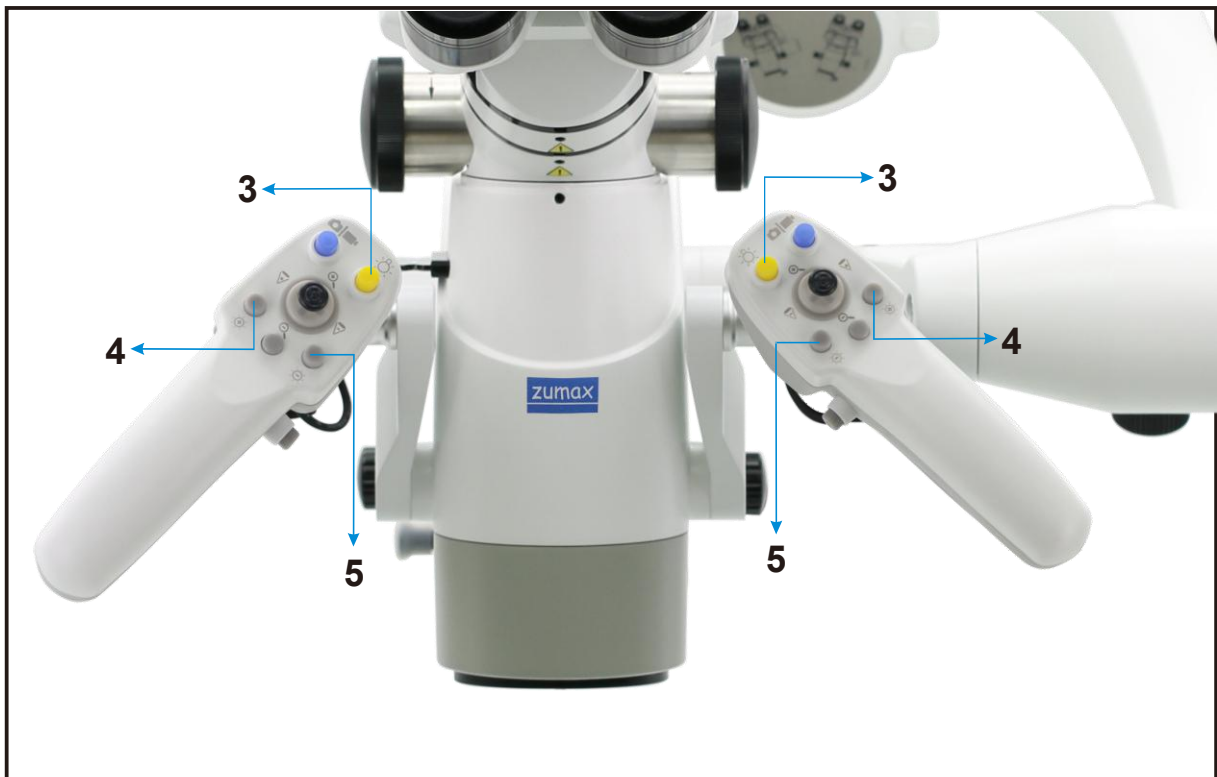
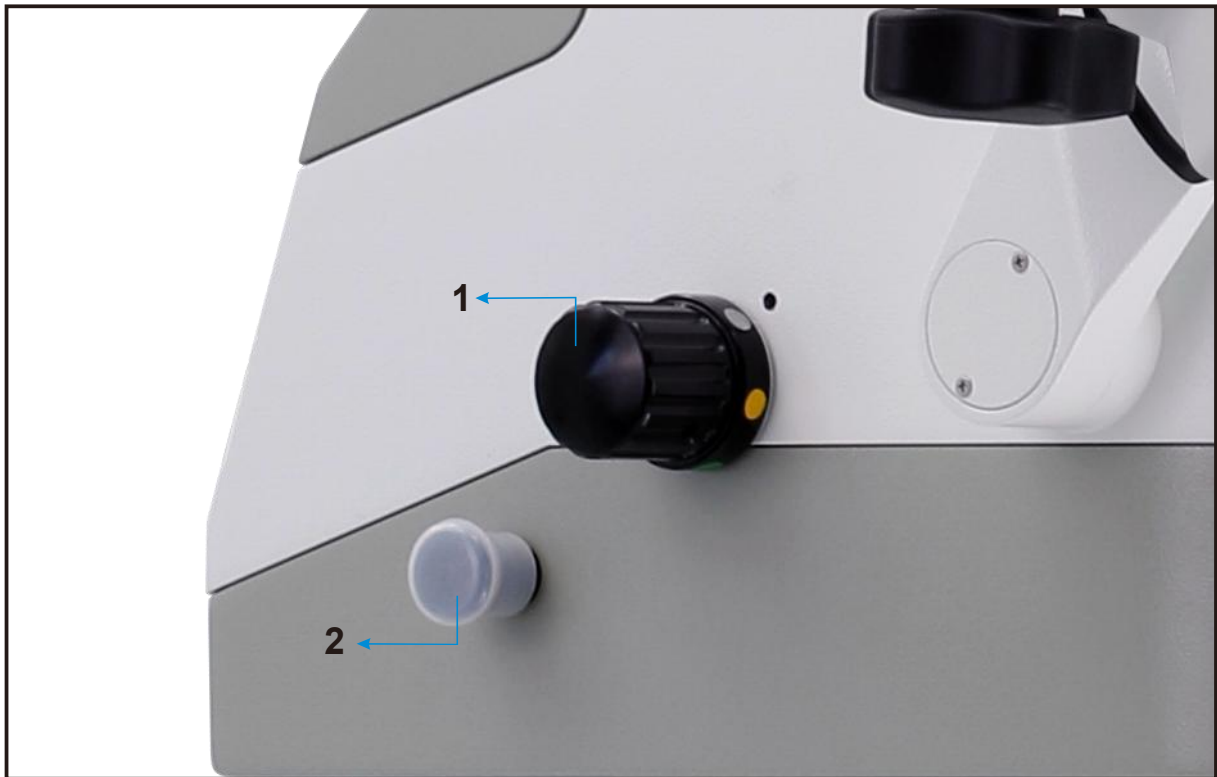
Anti-reflect module, large spot, yellow filter, green filter, small spot and micro spot.

The OMS3200, OMS3200 R2 and OMS3200 PRO microscopes are already equipped with twin-light sources as standard [2]. Pull out the lever to switch to the second light source.

If you choose a fluorescent module [2], there is no twin-light module, you can only choose one.

You can use the buttons on the multi-function handle to control the switch and brightness adjustment of the light source.

- LED light switch [3]
- Light intensity adjusting knob [4] [5]



Care and Maintenance

Cleaning the surface of device

The outer surface of the equipment may be cleaned with a wet cloth. The remaining stains can be cleaned off with a mixture of 50% C₂H₅OH and 50% distilled water.



Caution: Do not use any corrosive detergent or the surface may be damaged.

Cleaning the surface of the optical lens

- ▶ To prevent the dust from staining the lens, never expose the optical lens to air without the objective, eyepiece tube and eyepiece. Please use the dust cover after using the microscope.
- ▶ Cleaning the surface of the optical lens: To clean the dirt on lens, such as bloodstain, please use a special paper or absorbent cotton with a little bit of distilled water and wipe, the remaining stains can be cleaned off with a mixture of 50% ethanol and 50% ether. If there is dust on the lens, blow the dust off with a compressed air canister.



Caution: Do not wipe the lens with any corrosive detergent, otherwise it may be damaged.



Caution: Dirt on the lens must be cleaned immediately after the surgery. It will be hard to clean when the dirt air-dried.

Sterilization

All sterilization caps should be sterilized by autoclave. The following temperature and time are recommended:

Sterilization temperature: 134°C for 10 minutes;

Disposal of wastes

The waste produced by this device is LED light source, mirror paper or nonfat cotton. Please do not discard it. If there is a special waste treatment facility nearby, please use it as far as possible. The discarded instruments are processed according to the local environmental protection law. Please do not pollute the environment.

Replacing the LED

Please contact the after-sales service of manufacturer.

Replacing the fuse

The fuse is integrated with main power input socket. Please replace the fuse according to the following steps:

- ▶ Turn off the main power switch.
- ▶ Pull out the power plug from the main power plug.
- ▶ Find the fuse socket on the right side of power plug, take out the fuse socket from the side with a small screwdriver.
- ▶ Take out the melted fuse.
- ▶ Insert a new fuse and insert the fuse socket back again.
- ▶ Plug in power cable.
- ▶ Turn on the main power switch.

Specification of fuse:

OMS3200:	100 – 127	~ 50Hz	T4 AL250V
	220 – 240	~ 60Hz	T2.5 AL250V
OMS3200R2:	100 – 127	~ 50Hz	T4 AL250V
	220 – 240	~ 60Hz	T2.5 AL250V
OMS3200Pro:	100 – 127	~ 50Hz	T5 AL250V
	220 – 240	~ 60Hz	T3.15 AL250V



Caution: Please use the fuse specially designed for this device.

Replacing the power supply cords

Replacement the power supply cords should by the manufacturer specifies service person.



Warning: To avoid the unacceptable risk, please use the special cords for the device.

Care and Maintenance

In case there is any trouble, please first refer to the trouble-shooting guide. If you can't solve the problems by yourself, please contact the authorized distributor or our after-sales service department.

Trouble	Possible reason	Remedy
Equipment not working	Main power switch is not turned on	Turn on the main power switch or plug in power cable
	Main power down	Contact a local electrician
Illumination does not work	Main power is not turned on	Switch on the main power
	The fuse has been melted	Replace the fuse
	Power cable broken-down	Replacing the power cable
	Main power down	Contact a local electrician
	Electric part broken	Contact the after-sales service department
	The LED power cable is not inserted to the joint correctly	Insert it to the joint correctly
	Microscope not in working area but in "parking position"	Move the second arm to working area
	The LED has burnt	Contact the after-sales service department
Bulb turns on and off during the surgery.	Illumination brightness adjusting button is in low position	Adjust the button a higher position
	Something covered the heat elimination grooves	Take away the cover and clean the heat elimination grooves
Bulb turns on and off during the surgery.	Electric part defect	Contact the after-sales service department
The microscope is obstructed when making movement downwards	The star handle fixation screw of the second arm was fixed too tightly	Re-adjust the star handle fixation screw
Magnification change defect	—	Contact the after-sales service department
Filters defect or can't be switched	—	Contact the after-sales service department

Technical specification

Basic configuration

Magnification system	Motorized zoom system, with apochromatic 1:6 ratio
	1.8x-19.4x with 12.5x eyepieces
	Magnification factor $\gamma=0.4X-2.4X$
	11.6mm-124mm with 12.5x eyepieces
Tubes	0°-180° inclinable binocular tube with PD adjusting knob, f=170mm
Eyepieces	12.5x wide-field eyepieces, also suitable for eyeglass wearers
Objective/Focus	Motorized VarioDist objective lens, variable working distance 200-450mm
Illumination system	BriPlus illumination system, integrated true color LED illumination CT5500K/CRI 92>80,000 Lux at working distance 250mm
	30% auto-increased intensity at maximum magnification, >105,000 Lux
	Illumination spot between 90mm-73mm at working distance 250mm
	Twin switchable LEDs
	Yellow and green filters
Controls	FreeMov 3-electromagnetic brakes (OMS3200,OMS3200 R2) FreeMov 6-electromagnetic brakes (OMS3200 PRO)
	Multi-functional handles, below buttons to lock/unlock 3 brakes, Side buttons to lock/unlock 6 brakes, joysticks for motorized zoom +/-, motorized focus +/-, 4 buttons for taking photo/video, lighting +/-
	SmartMon LCD display, displaying current working distance, zoom factor, magnification, measurement factor, LED brightness
Construction	Floor stand with "H" shaped base, 632x632mm

	OMS3200	OMS3200 R2	OMS3200PRO
MagPlus 1.5 tube	O	O	O
Fluorescent module	O	O	O
Anti-reflect module	X	O	O
Integrated full HD/3D camera	O	X	X
Integrated 4K/4K-3D camera	X	O	O
Integrated laser filter	X	O	O
External lighting source	X	O	O

O: optional, X: unavailable

EMC (electromagnetic compatibility)

When using the device, the EMC precautions specified below must be observed.

- ▶ Only use spare parts approved by Zumax for this device.
- ▶ Do not use any portable or mobile RF communication equipment in the vicinity of the device as this may impair the device's function.
- ▶ Do not use a mobile phone in the vicinity of the equipment because the radio interference can cause the equipment to malfunction. The effects of radio interference on medical equipment depend on a number of various factors and are therefore entirely unforeseeable.
- ▶ Please note the EMC guidelines on the following pages.



Warning: The microscope should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the **ME EQUIPMENT** or **ME SYSTEM** should be observed to verify normal operation in the configuration in which it will be use.



Warning: Use of **ACCESSORIES**, transducers and cables other than those specified, with the exception of transducers and cables sold by the **MANUFACTURER** of the microscope as replacement parts for internal components, may result in increased **EMISSIONS** or decreased **IMMUNITY** of the microscope.

Electromagnetic interference

Guidance and manufacturer's declaration – electromagnetic emissions		
The microscope is intended for use in the electromagnetic environment specified below. The customer or the user of the microscope should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The microscope uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The microscope is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	N/A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	N/A	

Electromagnetic immunity for ME equipment and ME systems

Guidance and manufacturer's declaration – electromagnetic immunity			
The microscope is intended for use in the electromagnetic environment specified below. The customer or the user of the microscope should assure that it is used in such an environment.			
IMMUNITY test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines. ± 1 kV for input/output lines	± 2 kV for power supply lines. ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line to line ± 2 kV line to ground	± 1 kV line to line ± 2 kV line to ground	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% UT (100% dip in UT) for 0.5 cycle 0% UT (100% dip in UT) for 1 cycle 70 % UT (30 % dip in UT) for 25/30 cycles 0% UT (100% dip in UT) for 5 sec	0% UT (100% dip in UT) for 0.5 cycle 0% UT (100% dip in UT) for 1 cycle 70 % UT (30 % dip in UT) for 25/30 cycles 0% UT (100% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the microscope requires continued operation during power mains interruptions, it is recommended that the microscope be powered from an uninterruptible Power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30A/m	30A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE UT is the a.c. mains voltage prior to application of the test level.			

Electromagnetic immunity for non-life-supporting ME equipment and ME systems

Guidance and manufacturer's declaration – electromagnetic immunity			
The microscope is intended for use in the electromagnetic environment specified below. The customer or the user of the microscope should assure that it is used in such an environment.			
IMMUNITY test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF EN 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz~80 MHz 3 V/m 80 MHz~2.5 GHz	3 Vrms 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the microscope, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80 MHz~800 MHz $d=2.3\sqrt{P}$ 800 MHz~2.5 GHz where P is the output power rating of the transmitter in watts (W) according to the transmitter manufacturer's specifications and d is the recommended safety distance in meters (m). Field strengths from stationary RF transmitters, as determined by a site survey^a, should be less than the compliance level in all frequency ranges.^b Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a Field strengths of stationary transmitters such as base stations for mobile telephones and mobile land radio equipment, amateur radio stations, AM and FM radio broadcast and TV broadcast transmitters cannot be theoretically predicted accurately. To assess the electromagnetic environment with respect to stationary RF transmitters, a site study of the electromagnetic phenomena should be considered. If the measured field strength in the location where the device is used exceeds the compliance levels indicated above, the device should be monitored to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the ME equipment or ME system. b Field strengths should be less than 3 V/m over the frequency range from 150 kHz to 80 MHz.			

Recommended separation distances between portable and mobile RF communication systems and the microscope

Recommended separation distances between portable and mobile RF communication systems and the microscope.

The microscope is intended for use in an electromagnetic environment where RF disturbances are controlled. The customer or the user of the microscope can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and the microscope depending on the output power of the communication equipment as specified below.

Rated maximum output power of transmitter. W	Separation distance according to the frequency of the transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.



The CE mark indicates that the product complies with the European medical device regulation (EU) 2017/745.



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