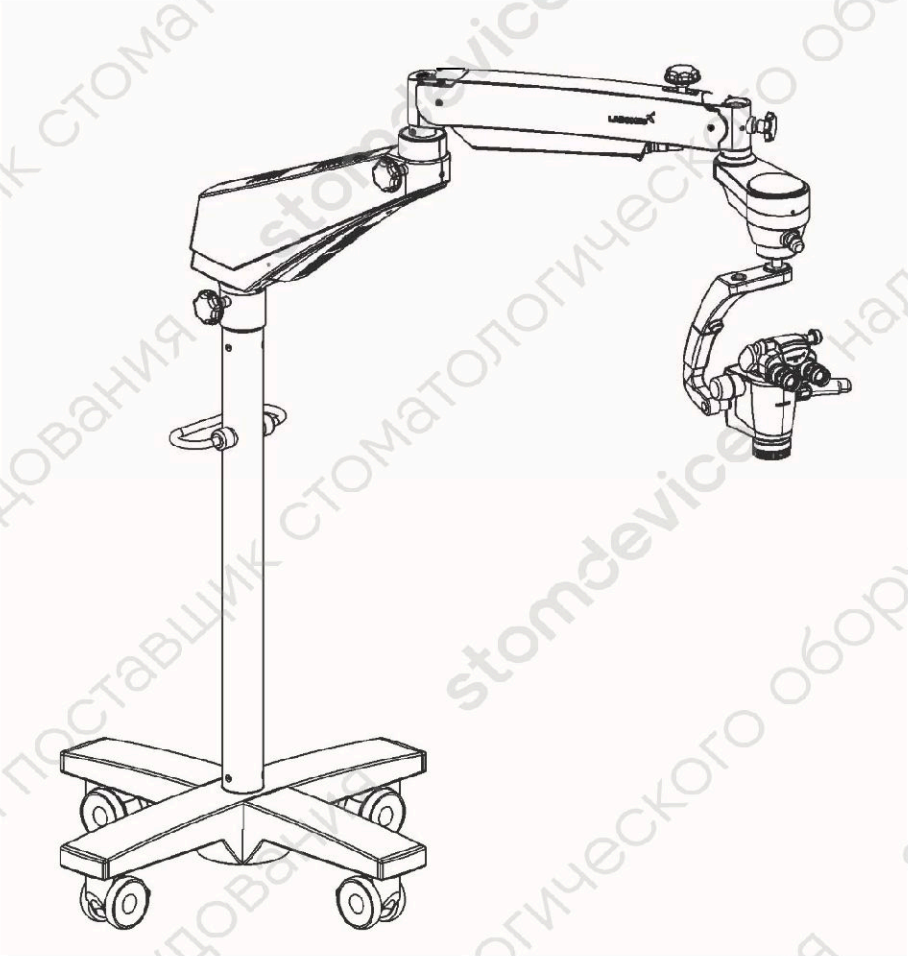
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LABOMED
ideas for vision

MAGNA

User Manual

Operating Microscope Dentistry



To ensure proper use of this instrument as well as to avoid injury while operating instrument, understanding this manual completely before use is highly recommended.

6129000-796 Magna Issue 1.3
Printed on April. 2018

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1. INTRODUCTION AND INTENDED USE

LABOMED Magna is a surgical and diagnostic microscope that is adaptable for different surgical needs for consistent visualization during all intraoperative phases of endodontics by providing a magnified view of the surgical field without compromising performance.

The microscope provides extremely high optical image quality, good depth of focus, and a wide field of view for precise surgery. Illumination control and high eye point of the observation head helps reduce the user's work fatigue and allows comfortable use over a long period.

Salient features of this microscope are:

1. The observation head can easily be positioned with the help of a suspension arm.
2. An advanced Galilean Zoom 1:6, also convertible to 8 step magnichanger allows optimal magnification for various needs at different magnification levels.
3. Cold light illumination with a high intensity 50W LED lamp is provided using a fiber optic guide for proper illumination.
4. An effortless articulating system ABA (Automatic Balancing Arm) features an electromagnetic brake system that enables the ultimate flexibility in manuvering the microscope's viewing angle and position.
5. The Labomed *NuVar* CMO with variable working distance objective comes standard, and provides user greater convenience in achieving a comfortable working distance.
6. The rigid Cross base with caster wheels provides the instrument with stability and mobility.
7. When the microscope is not in use, the suspension arm can be folded over the main body for compact storage.

Intended Use

The Magna microscope is an AC powered device intended for use during diagnosis and surgery to provide a magnified view of the region of interest.

Note: Use Magna as specified in the intended use.

Configurations

Microscope	**Catalogue No.**
Magna Floor Mount	6129000
Magna Ceiling Mount (Old)	6129001
Magna Wall Mount (Short Arm)	6129002
Magna Wall Mount (Long Arm)	6129003
Magna Heavy Ceiling Mount with Long Arm	6129004

Ceiling Mount Options (Heavy Type / 170 mm Dia)

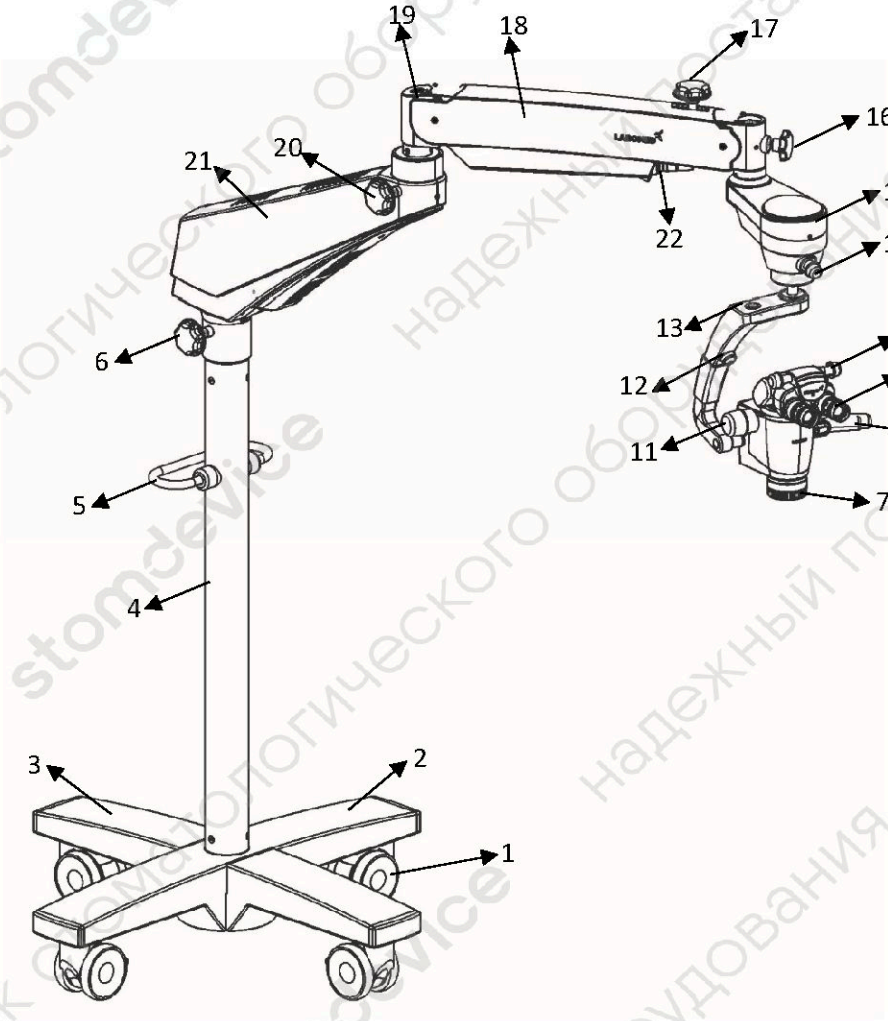
Ceiling Height	**Column Length (Microscope)**
10 Ft (305 cm)	2.4 Ft (740 mm)
12 Ft (366 cm)	4.4 Ft (1350 mm)

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2. PRODUCT DESCRIPTION

MAGNA FLOOR STAND (Product Code: 6129000)



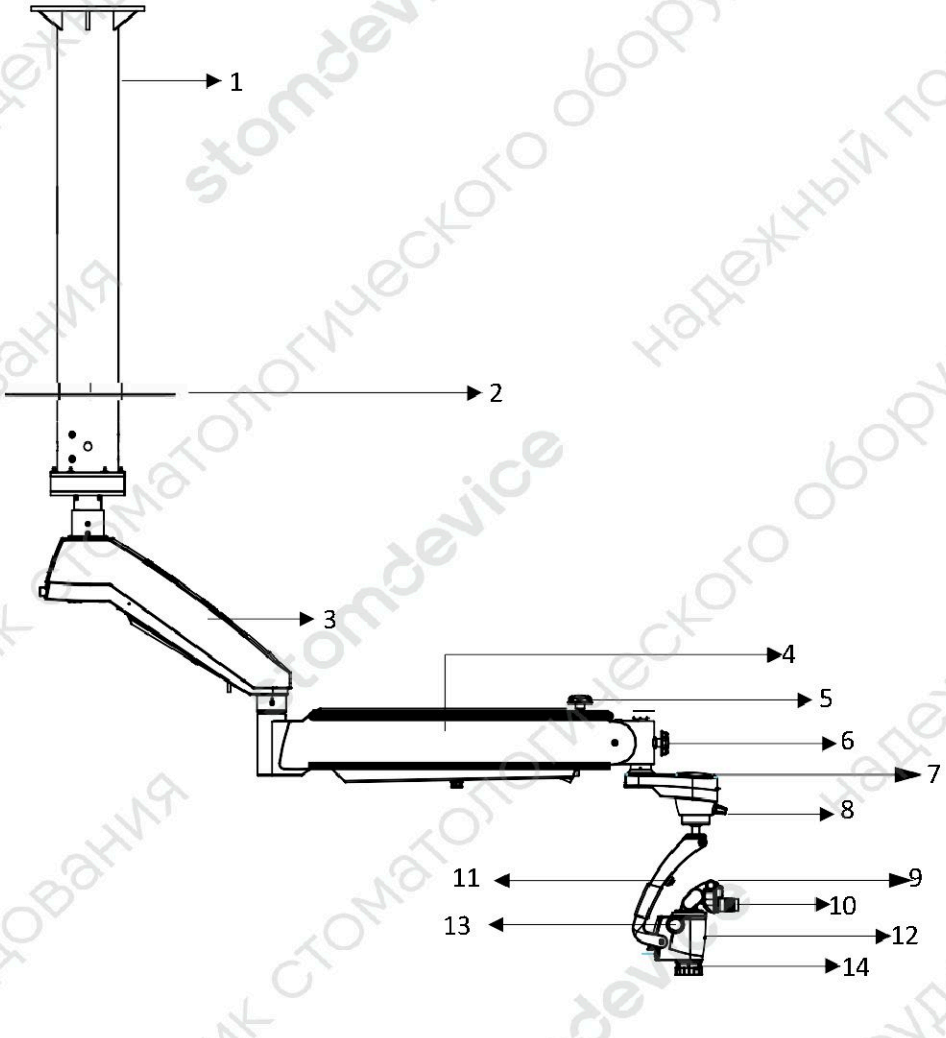
1. Caster wheel with Brakes
2. Cross Base Top
3. Cross Base Bottom
4. Column
5. Hand Rest
6. Swivel Arm Locking Knob
7. Common Main Objective with Fine Focusing
8. Right Hand Release (Electromagnetic Clutch)
9. Eyepieces
10. Ergo Head 0 - 210° adjustable
11. Zoom Magnification Knob
12. Left hand Release (Electromagnetic Clutch)
13. 2 pin connector for Clutch Buttons
14. Illumination Control Knob
15. ABA (Auto Balancing Arm) Electromagnetic Clutch
16. Auto Balancing Arm Locking Knob
17. Suspension Arm Hydraulic Movement Lock
18. Suspension Arm
19. Suspension Arm Spring Tension Adjustment
20. Suspension Arm Movement Locking Knob
21. Swivel Arm
22. 7 pin connector for ABA Arm

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3. PRODUCT DESCRIPTION

Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)



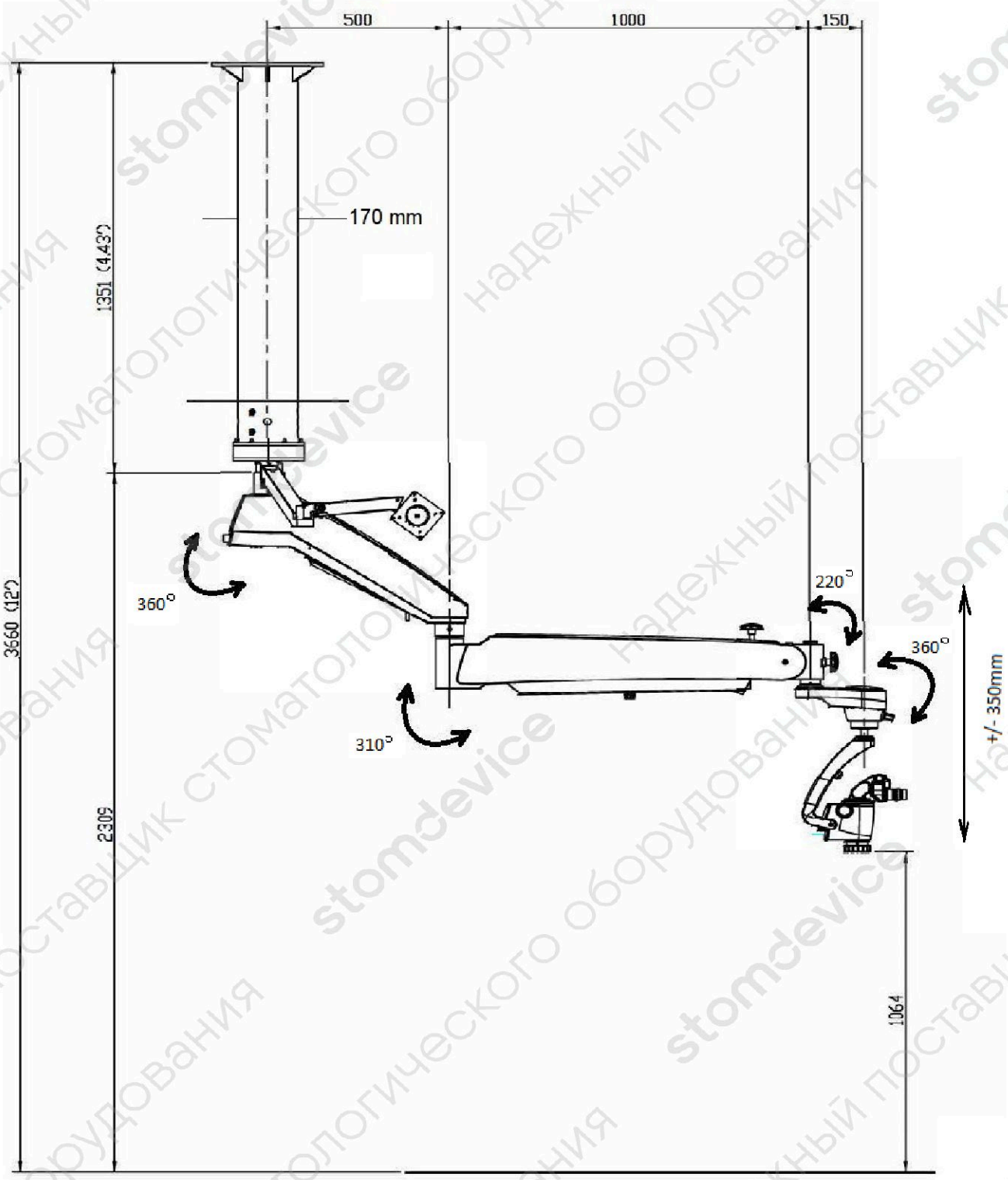
1. Column
2. Cover Mount (to be used in false ceiling only)
3. Swivel Arm
4. Suspension Arm
5. Suspension Arm Hydraulic Movement Lock
6. Auto Balancing Arm Lock Knob
7. ABA (Auto Balancing Arm) Electromagnetic Clutch
8. Illumination Control Knob
9. Ergo Head 0 - 210° adjustable
10. Eyepieces
11. Left hand Release (Electromagnetic Clutch)
12. Right Hand Release (Electromagnetic Clutch)
13. Zoom Magnification Knob
14. Common Main Objective with Fine Focusing

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3. (A) INSTALLATION REFERENCES

Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)

CEILING MOUNT SYSTEM FOR 12 FEET CEILING HEIGHT

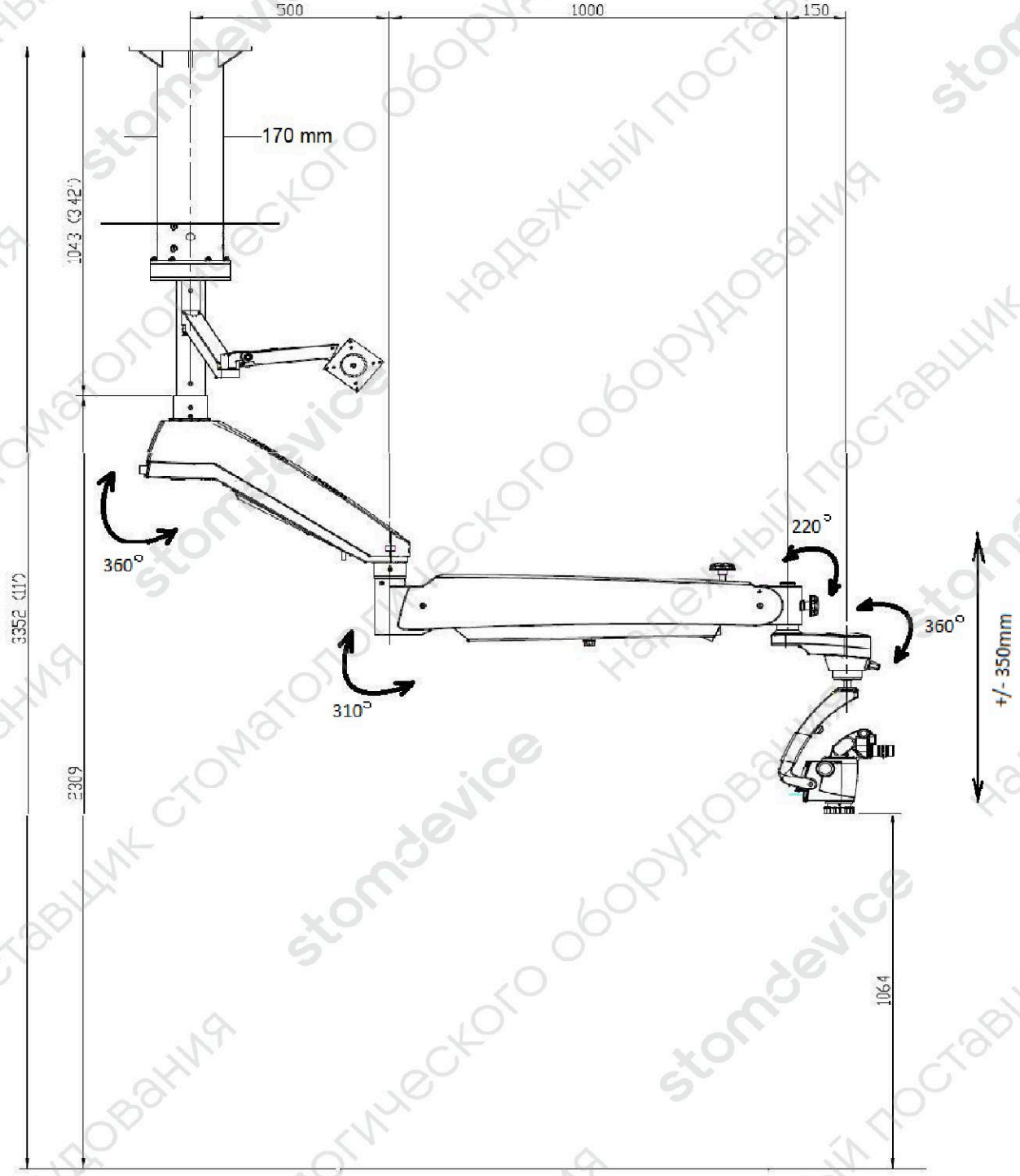


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INSTALLATION REFERENCES

Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)

CEILING MOUNT SYSTEM FOR 11 FEET CEILING HEIGHT

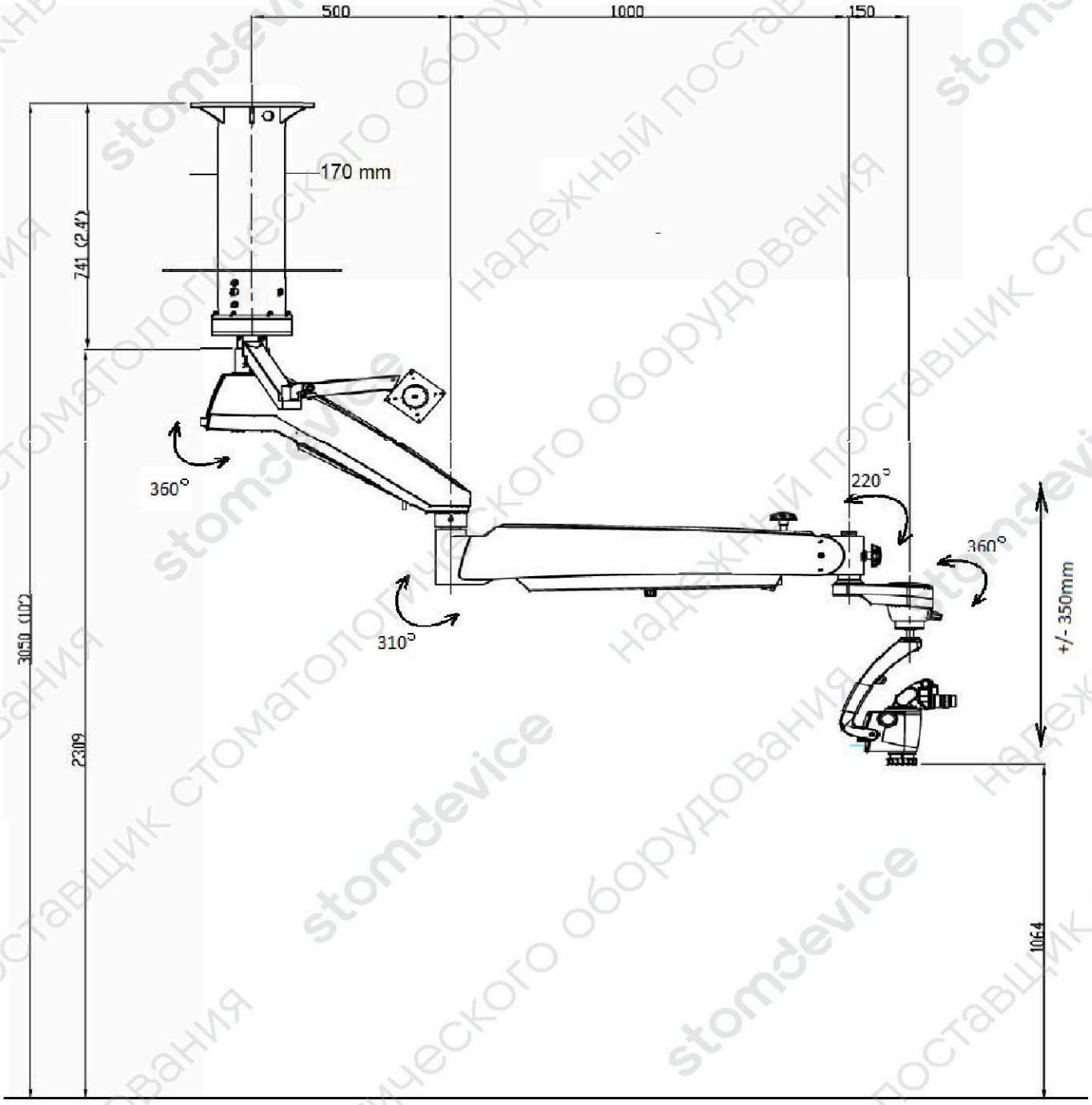


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INSTALLATION REFERENCES

Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)

CEILING MOUNT SYSTEM FOR 10 FEET CEILING HEIGHT

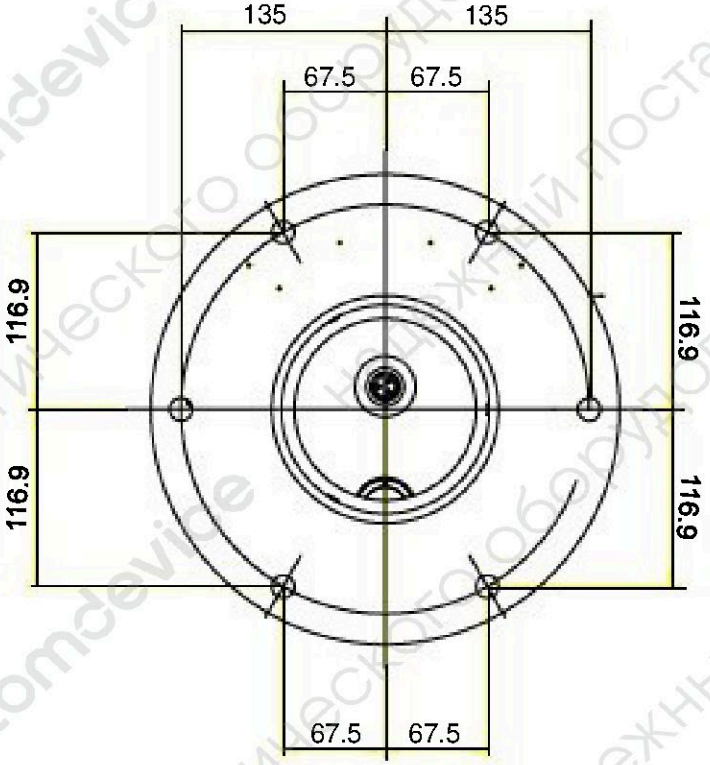


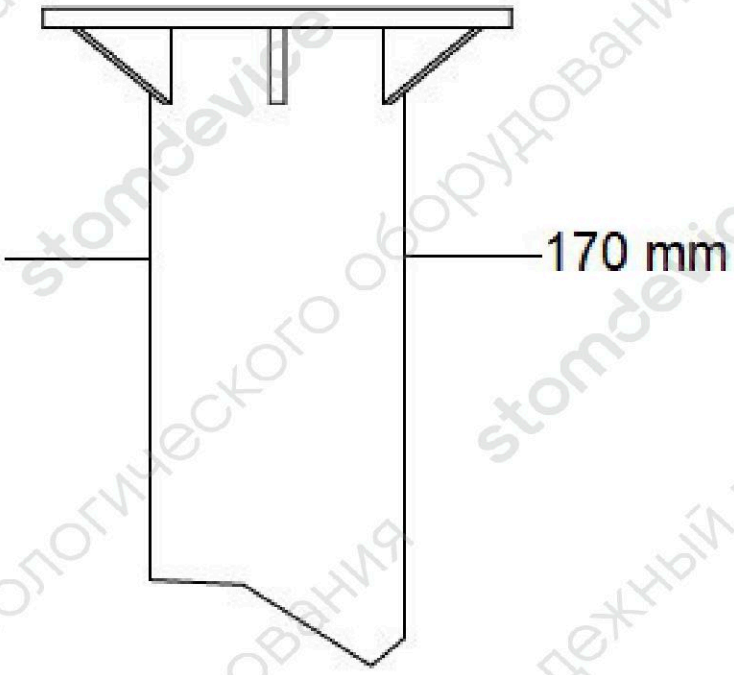
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INSTALLATION REFERENCES

Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)

Marking References

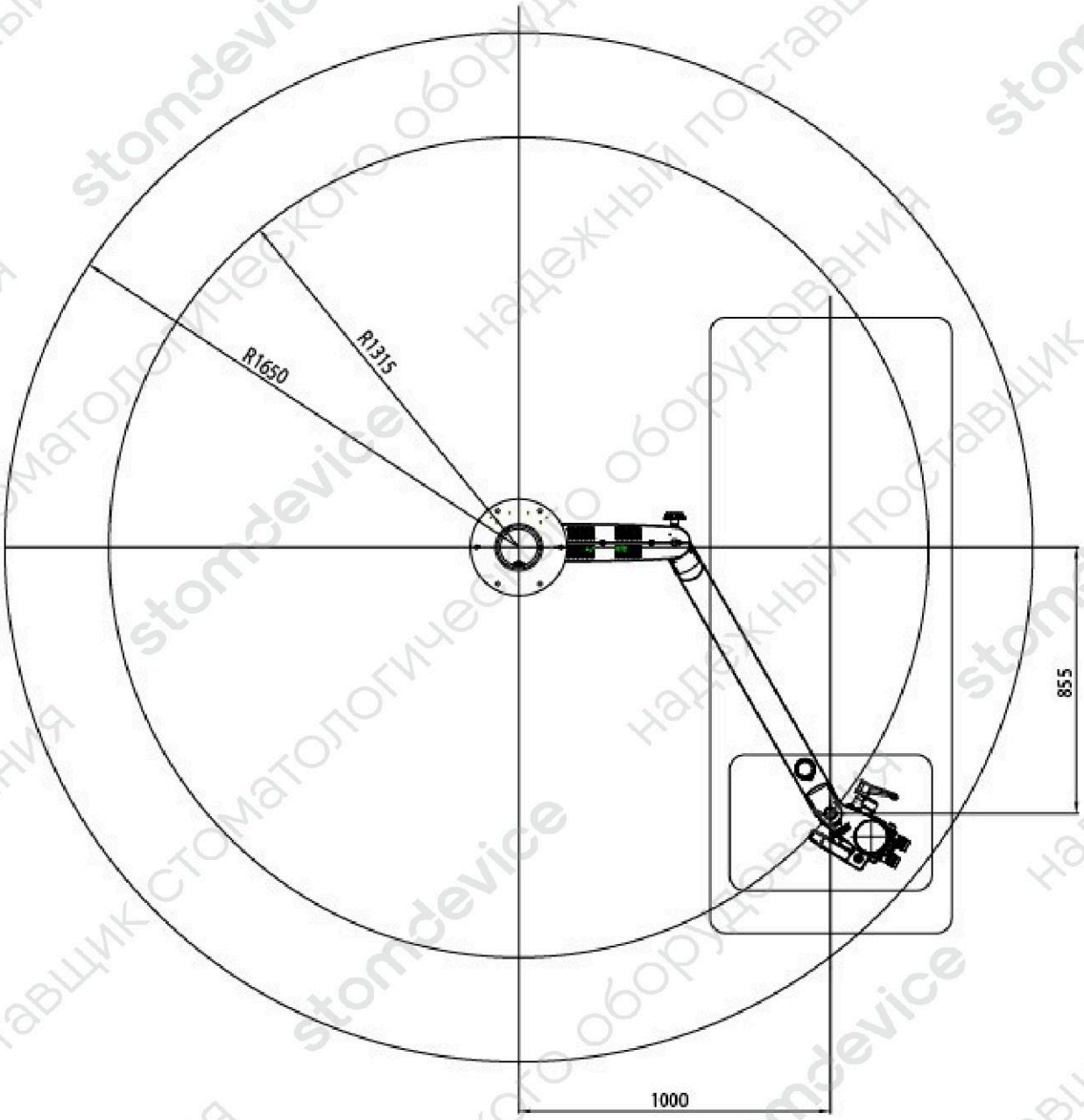




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INSTALLATION REFERENCES

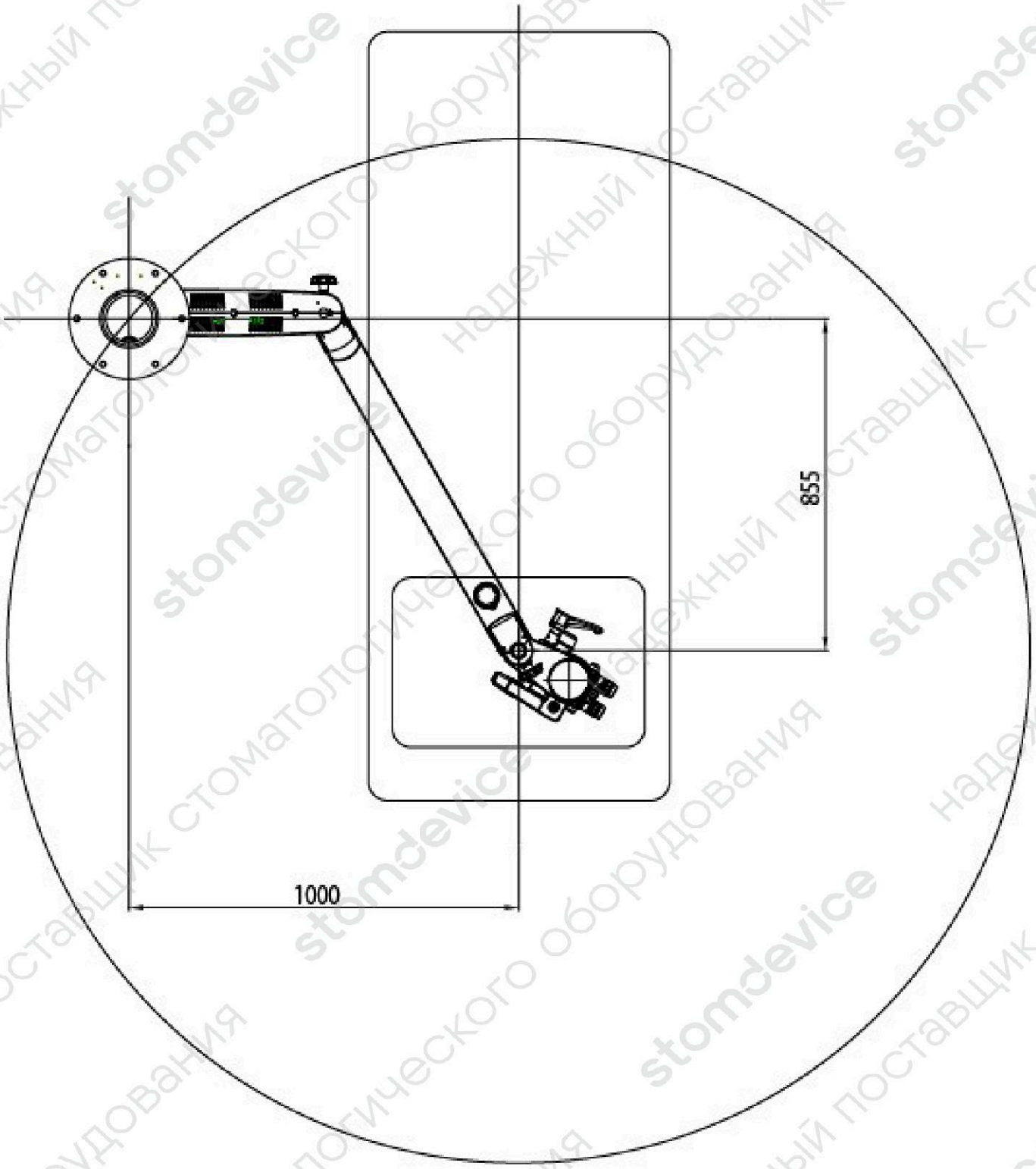
Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)



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INSTALLATION REFERENCES

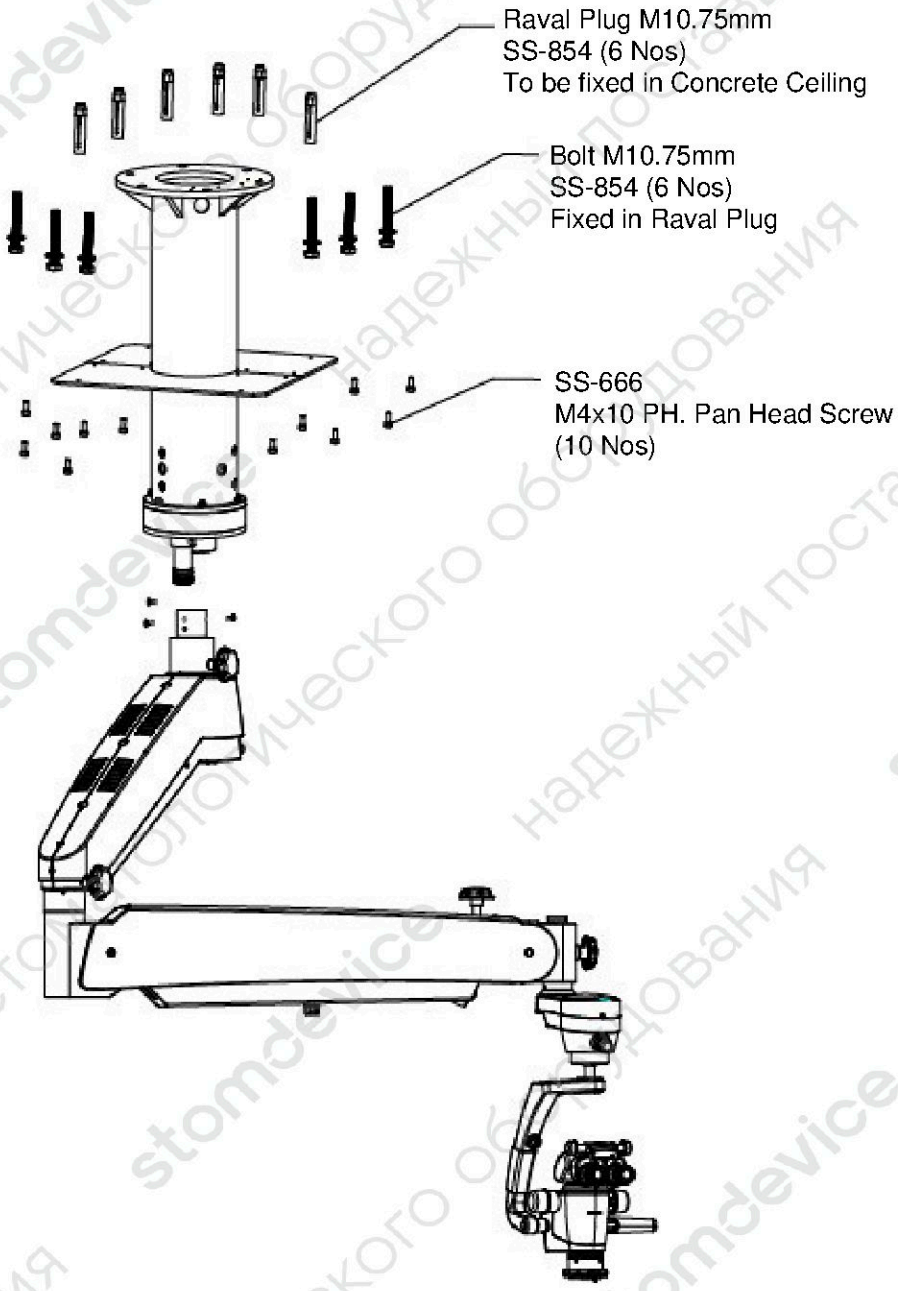
Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)



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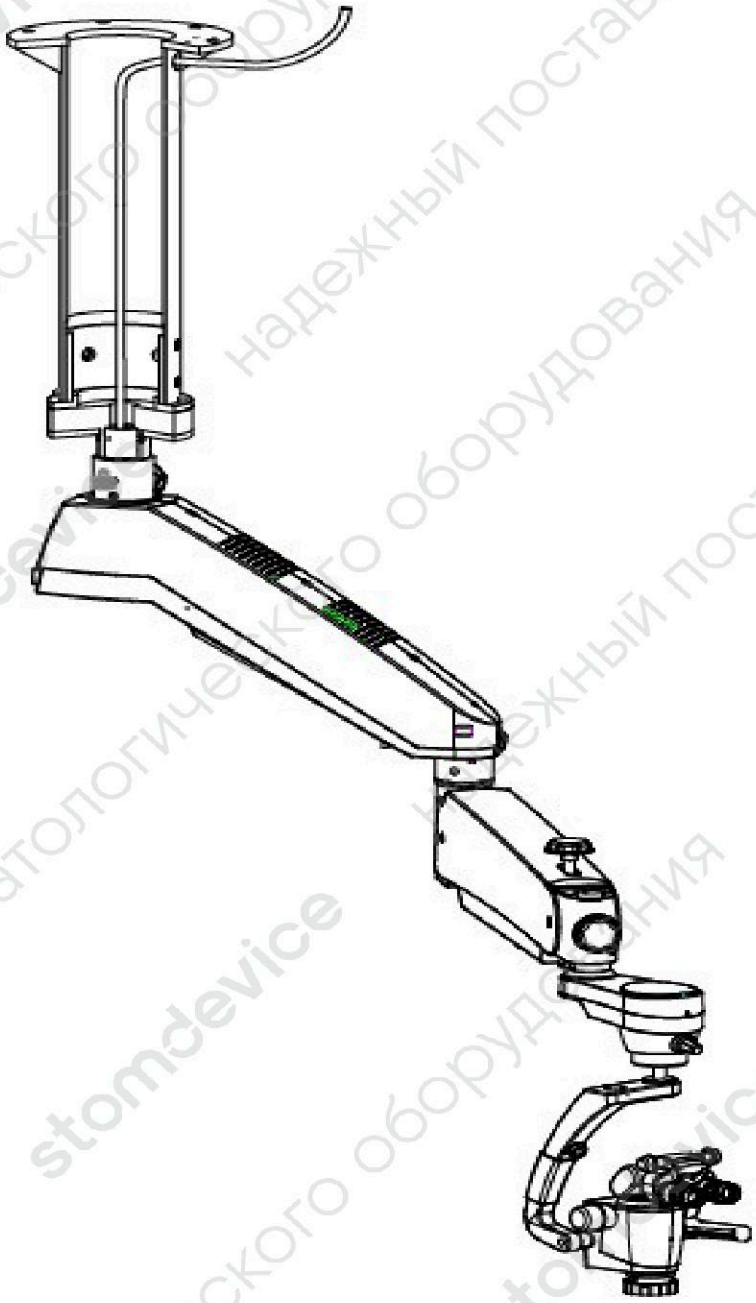
Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)



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Magna with Heavy Ceiling Mount & Long Arm (Product Code: 6129004)

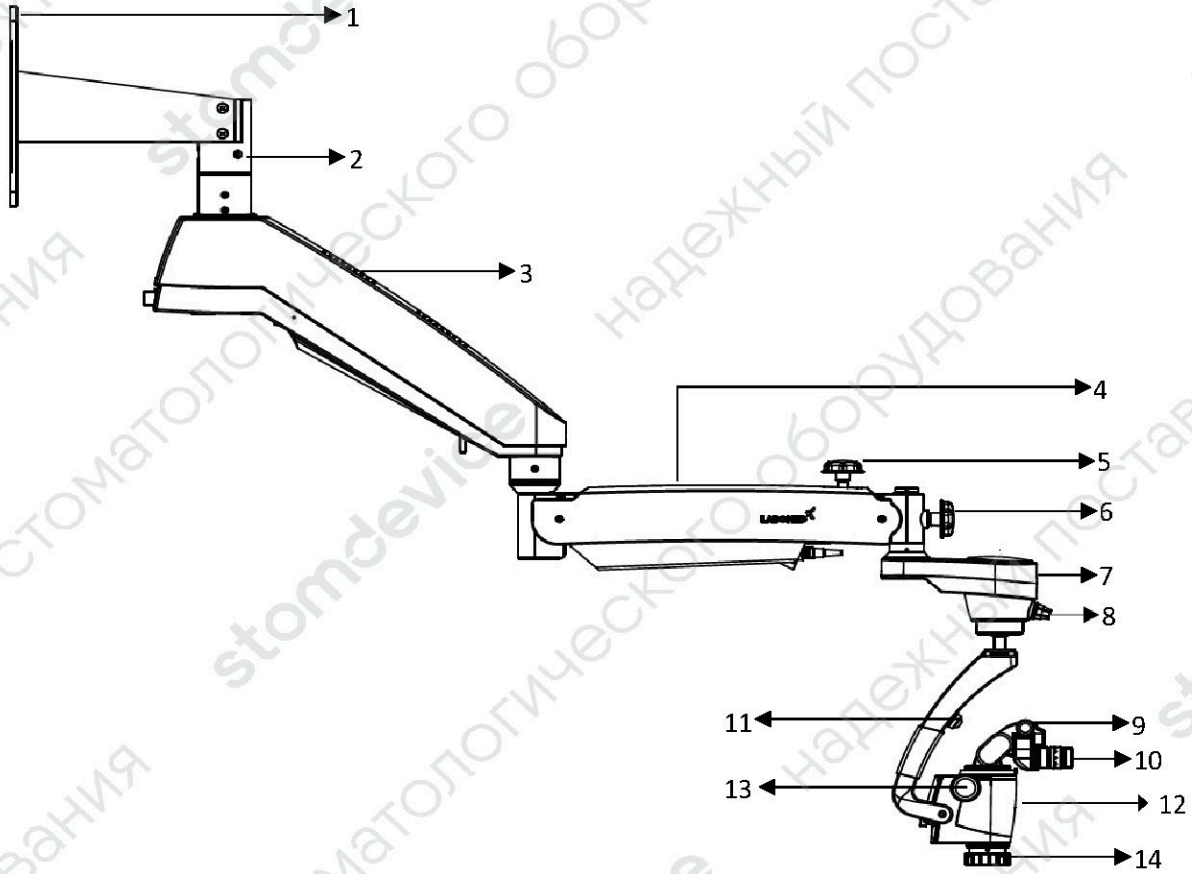


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4. PRODUCT DESCRIPTION

Magna Wall Mount with Short Arm (Product Code: 6129002)

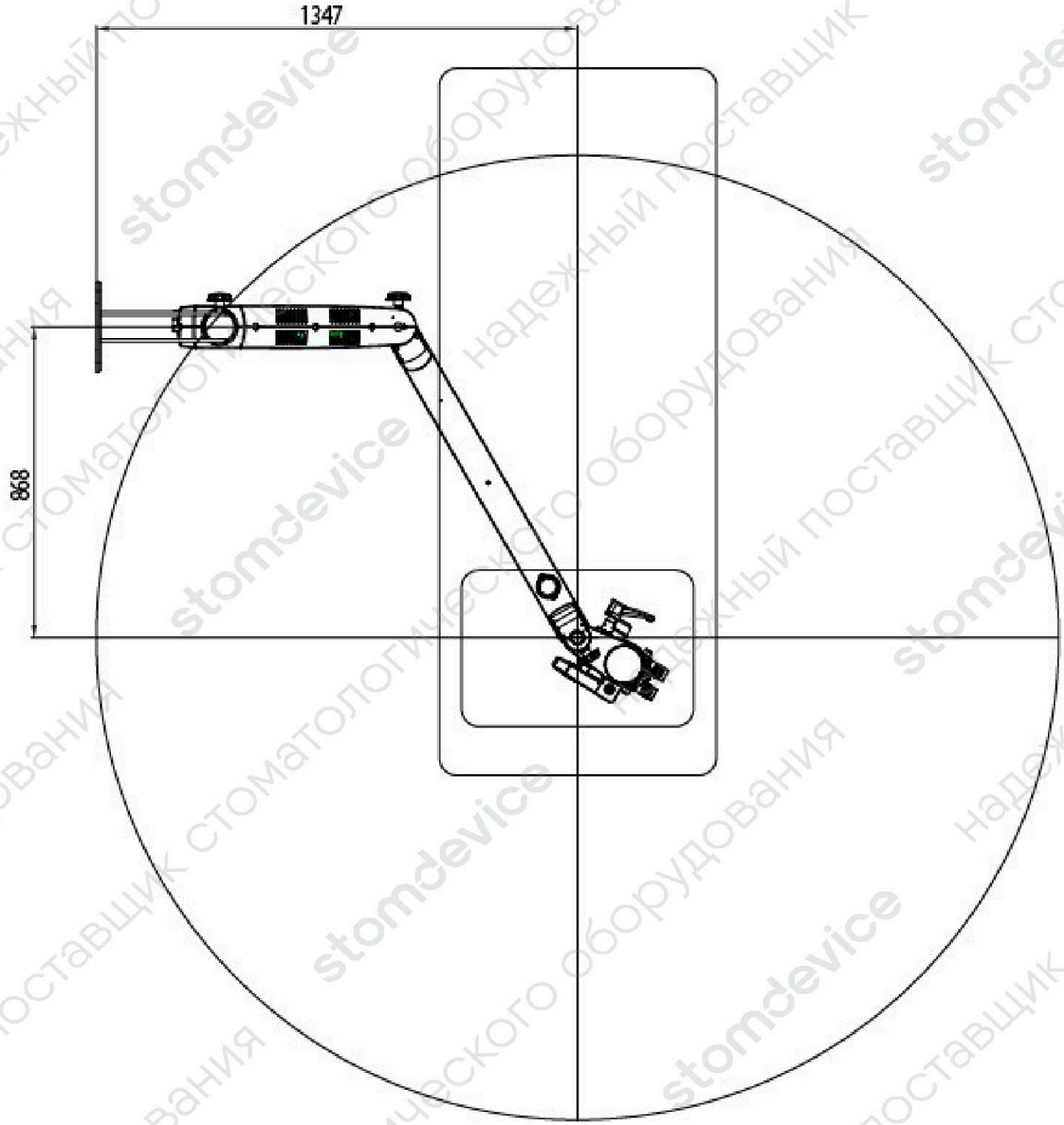


1. Wall Mount Bracket
2. Mount Shaft
3. Swivel Arm
4. Suspension Arm
5. Suspension Arm Hydraulic Movement Lock Knob
6. Auto Balancing Arm Lock knob
7. ABA (Auto balancing Arm) Magnetic Clutch
8. Illumination Control Knob
9. Ergo Head 0 - 210° adjustable
10. Eyepieces
11. Left hand Release (Electromagnetic Clutch)
12. Right Hand Release (Electromagnetic Clutch)
13. Zoom Magnification Knob
14. Common Main Objective with Fine Focusing

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INSTALLATION REFERENCES

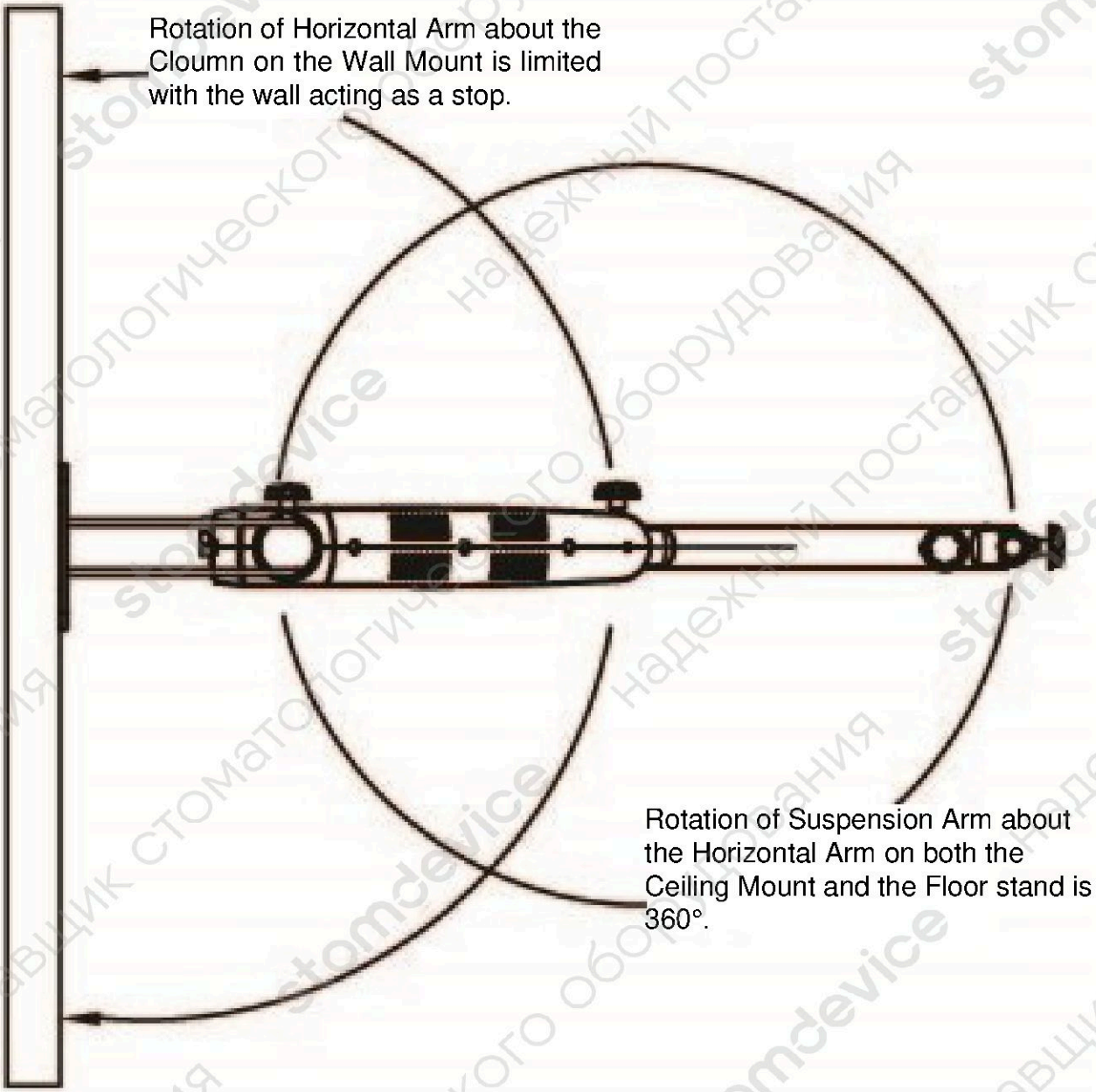
Magna Wall Mount with Short Arm (Product Code: 6129002/6129003)



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INSTALLATION REFERENCES

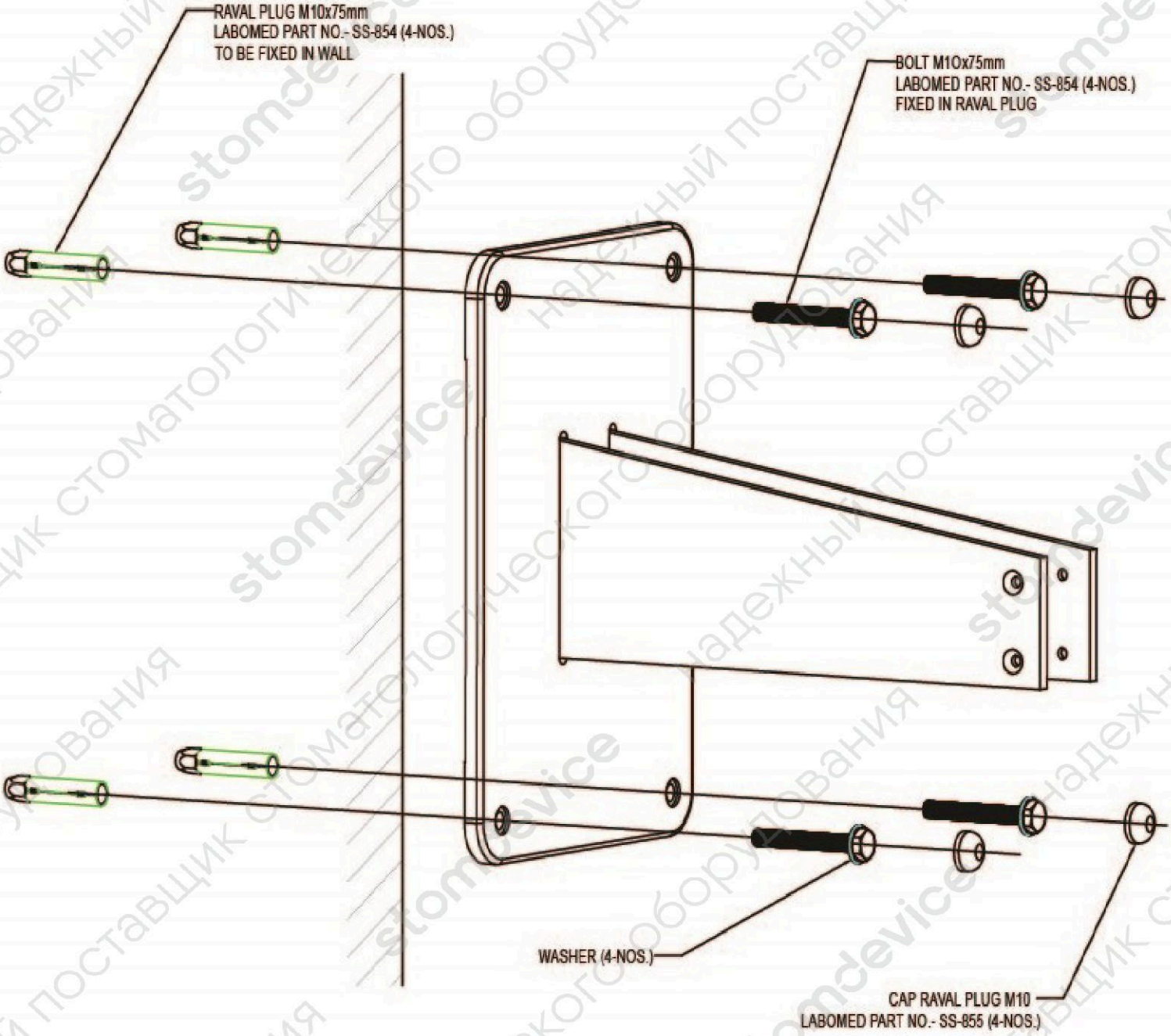
Magna Wall Mount with Short Arm (Product Code: 6129002/6129003)



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INSTALLATION REFERENCES

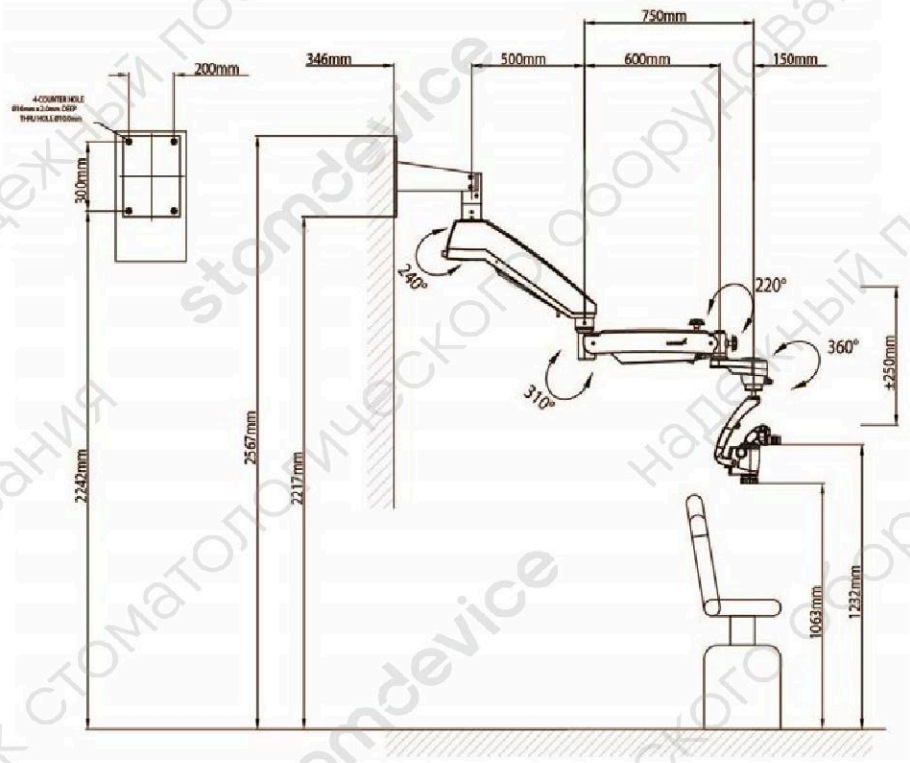
Magna Wall Mount with Short Arm (Product Code: 6129002/6129003)



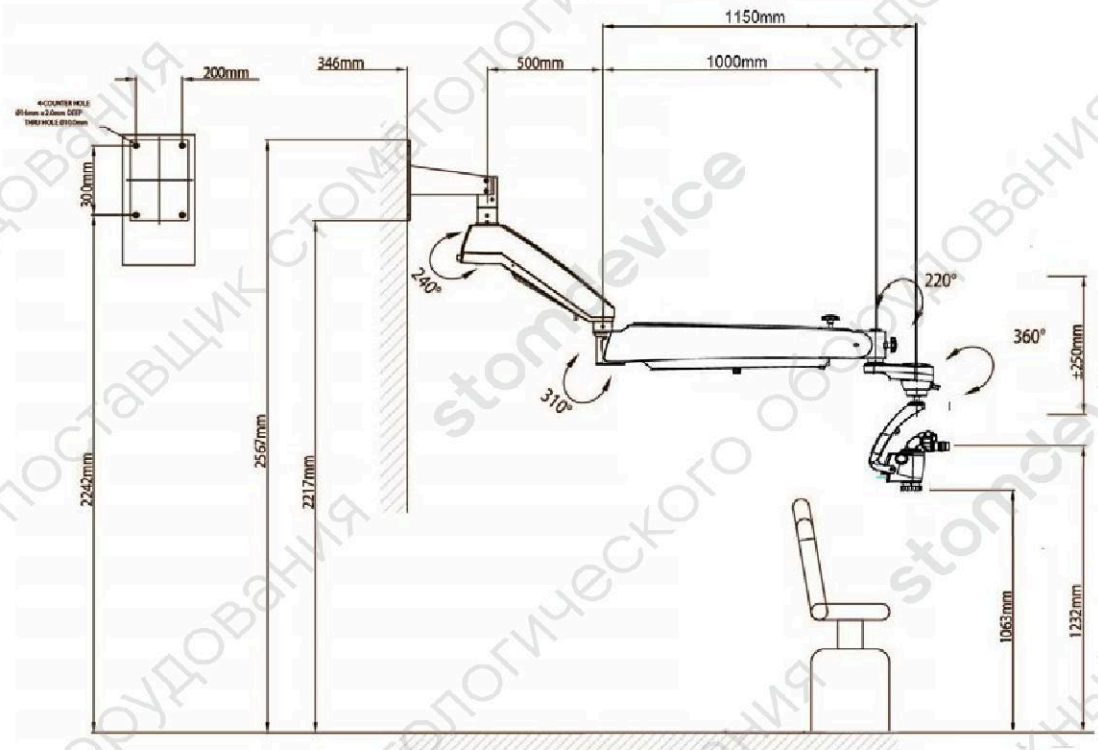
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INSTALLATION REFERENCES

Magna Wall Mount with Short Arm (Product Code: 6129002)



Magna Wall Mount with Long Arm (Product Code: 6129003)



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5. CONSTRUCTION REQUIREMENTS (CEILING/WALL MOUNT)

1. The 6129001 ceiling mount must be installed on the LABOMED ceiling column plate.
2. The construction specialist must confirm in writing that the applicable regional and local codes & regulations have been complied with and that the points listed below have been observed. The costumer must keep this confirmation with his records on the ceiling mount. A copy of this document must be enclosed by the customer with his record.
3. The roof on which 6129001 ceiling mount is to be mounted must have the following load capacity.
4. Perpendicular force: minimum 1500Nm.
5. Torque: Perpendicular to the ceiling 1500Nm. minimum and parallel to the ceiling 1200Nm minimum Also take into account any additional loads acting on the ceiling and any other load anchored in the ceiling.
6. The roof should preferably be made of minimum 6 inches concrete.
7. The ceiling plate must be aligned in a parallel position (max. deviation ±5°)

8. The effective strength of ceiling must rate at least 5000Nm.

   The following must be taken into consideration when calculating the effective strength:
   - Specification of the bolt / anchor manufacturer.
   - Quality of the structural roof, e.g. the strengths and the thickness of the concrete.
   - Spacing of anchor holes and weakening effect of anchor holes in the ceiling.

NOTE:
If an existing ceiling mount is ever exchanged, never re-use the old anchors. New anchor holes must be drilled. When calculating the effective strength of the new anchors, make sure to take into account the weakening effect of the old holes in the ceiling.
On the basis of the above aspects, the person responsible for the building must decide on and take responsibility for the most suitable method of anchoring.

The weight of the mount including the surgical microscope is as follows:
- Ceiling mount kit: Approx.....30 kg.
- Surgical microscope (Swivel Arm & Suspension Arm: Approx.....28 Kg.
- Microscope Carrier: Approx..... 10 kg.

Control and Power Supply of the System
Power line: 3X1.5mm2
Fuse: 2.5A
Power consumption: 1000V

NOTE:
A socket with properly installed protective earth connection must be provided at the installation site near the ceiling flange.
The terminals for power connections are located on the ceiling mount.
Potential equalization: take the necessary action in the building to include the instrument in the protective measures of “potential equalization”.

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CONSTRUCTION REQUIREMENTS (CEILING/WALL MOUNT)

NOTE:
The series 6129001 suspension system including the components mentioned here comply safety requirements with CE, MDD 92/42 EEC and IEC 60601-1-3rd.

Such activities as the installation of the ceiling mount and the installation of conduits and electrical lines are the customer's responsibilities.

List Of Contents:

- Rowel Plug with Cap (Ceiling - 6 pcs./ Wall - 4pcs) - Part No. SS - 854
- Washers (Ceiling - 6 pcs / Wall - 4 pcs) - Part No. 6134010 - 451
- Acrylic Plate - Part No. 6129001 - 043
- Hole Mounting Template (Ceiling) - Part No. 6129001 - 404
- Ceiling Mount cover - Part No. 6137200 - 014
- Column - Part No. 6129001 - 117
- Hole Mounting Template (Wall) - Part No. 6129002 - 403
- M4x12 Pan Head Screws for Acrylic Plate- 10pcs - Part No. SS - 666
- Threaded Spacer- 12 pcs - Part No. 6129001 - 122
- M10x40 Socket Head Cap Screw- 4 pcs - Part No. SS - 707
- M6x10 Socket Set Screw- 3 pcs - Part No. SS - 174

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6. WARNINGS AND CAUTIONS

LABOMED is not responsible for the safety and reliability of this instrument when:
- Assembly, disassembly, repair, or modification is made by unauthorized dealers or persons.
- The instrument is not used in accordance with this user manual.

A WARNING is an instruction that draws attention to the risk of injury or death.

WARNING: USERS OF THIS EQUIPMENT SHOULD BE THOROUGHLY TRAINED IN THE APPROPRIATE MEDICAL PROCEDURES. FURTHERMORE, THEY SHOULD TAKE THE TIME TO READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE PERFORMING ANY PROCEDURE. THEY SHOULD ALSO READ AND UNDERSTAND THE INSTRUCTIONS FOR ANY OTHER EQUIPMENT USED IN CONJUNCTION WITH THIS MICROSCOPE (i.e. ELECTROSURGICAL GENERATORS). FAILURE TO DO SO MAY RESULT IN INJURY TO THE PATIENT AND/OR DAMAGE TO THE MICROSCOPE.

WARNING: THIS INSTRUMENT SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USER MANUAL. THE SAFETY OF THE OPERATOR AND THE PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY LABOMED.

WARNING: DO NOT REPAIR OR SERVICE THIS INSTRUMENT WITHOUT AUTHORIZATION FROM THE MANUFACTURER. ANY REPAIR OR SERVICE TO THIS INSTRUMENT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY LABOMED, OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: MODIFICATIONS TO THIS INSTRUMENT ARE NOT ALLOWED. ANY MODIFICATION TO THIS UNIT MUST BE AUTHORIZED BY LABOMED, OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: IF THIS INSTRUMENT IS MODIFIED, APPROPRIATE INSPECTION AND TESTING MUST BE CONDUCTED TO ENSURE CONTINUED SAFE USE OF THIS INSTRUMENT.

WARNING: TO AVOID RISK OF ELECTRIC SHOCK, THIS EQUIPMENT MUST ONLY BE CONNECTED TO A SUPPLY MAIN WITH PROPER EARTHING, OR DAMAGE TO THIS INSTRUMENT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: ENSURE THAT THE VOLTAGE APPLIED TO THE UNIT IS THE SAME AS THE VOLTAGE INDICATED ON THE DATA PLATE, OR DAMAGE TO THE UNIT MAY OCCUR. TO USE IN FLUCTUATION VOLTAGE ENVIRONMENT CONSTANT VOLTAGE STABILIZER IS RECOMMENDED FOR SAFE & EFFICIENT USE OF DEVICE.

WARNING: THIS INSTRUMENT MUST BE PLUGGED IN TO AN OUTLET WITH AN EARTH GROUND. DO NOT REMOVE OR DAMAGE THE EARTH GROUND CONNECTION ON THE POWER INPUT CONNECTOR OR THE UNIT'S POWER CORD, OR DAMAGE TO THE INSTRUMENT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: THE EQUIPMENT OR SYSTEM SHOULD NOT BE USED ADJACENT OR STACKED WITH OTHER EQUIPMENT LIKE MRI MACHINES, RFID, SECURITY SYSTEMS LIKE METAL DETECTORS, OR SIMILAR DEVICES. IF ADJACENT OR STACKED USE IS NECESSARY, THE EQUIPMENT OR SYSTEM SHOULD BE OBSERVED TO VERIFY NORMAL OPERATION IN THE CONFIGURATION IN WHICH IT WILL BE USED.

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WARNINGS AND CAUTIONS

WARNING: THIS INSTRUMENT IS NOT SUITABLE FOR USE IN THE PRESENCE OF FLAMMABLE ANESTHETIC MIXTURES SUCH AS OXYGEN OR NITROUS OXIDE.

WARNING: LED RADIATION - DO NOT STARE DIRECTLY INTO THE BEAM WHEN THE MICROSCOPE IS IN THE ON POSITION. INSTRUMENT IS PASSED IN RISKGROUP 2 PER IEC62471. (BLUE LIGHT HAZARDS).

WARNING: THE USE OF ACCESSORIES OR CABLES OTHER THAN THOSE SPECIFIED, WITH THE EXCEPTION OF THOSE SOLD BY THE MANUFACTURER AS REPLACEMENT PARTS FOR THE INTERNAL COMPONENTS, MAY RESULT IN INCREASED EMISSIONS OR DECREASED IMMUNITY OF THE EQUIPMENT OR SYSTEM.

A CAUTION is an instruction that draws attention to the risk of damage to the product.

CAUTION: THE INTERNAL CIRCUITRY OF THE INSTRUMENT CONTAINS ELECTROSTATIC SENSITIVE DEVICES (ESD) THAT MAY BE SENSITIVE TO STATIC CHARGES PRODUCED BY THE HUMAN BODY. DO NOT REMOVE THE COVERS WITHOUT TAKING PROPER ESD PRECAUTIONS.

CAUTION: DO NOT USE SOLVENTS OR STRONG CLEANING SOLUTIONS ON ANY PART OF THIS INSTRUMENT, AS DAMAGE TO THE UNIT MAY OCCUR. SEE THE CARE AND MAINTENANCE SECTION FOR DETAILED CLEANING INSTRUCTIONS.

CAUTION: MEDICAL ELECTRONIC EQUIPMENT NEEDS SPECIAL PRECAUTIONS WITH RESPECT TO ELECTROMAGNETIC CHARGE (EMC) AND NEEDS TO BE INSTALLED AND SERVICED ACCORDING TO THE EMC INFORMATION PROVIDED IN THE ACCOMPANYING DOCUMENTS.

CAUTION: PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT CAN AFFECT MEDICAL ELECTRICAL EQUIPMENT.

CAUTION: THIS INSTRUMENT IS NOT TO BE USED NEAR HIGH-FREQUENCY EMITTING SURGICAL EQUIPMENT.

CAUTION: DO NOT CONNECT ANY EQUIPMENT TO THE DEVICE OTHER THAN THOSE INTENDED FOR USE WITH THE DEVICE.

CAUTION: DO NOT USE A CONVERTER ADAPTER THAT WILL CONVERT THE THREE-PRONG AC PLUG TO A TWO-PRONG LINE PLUG. THE POWER SUPPLY IN THIS MICROSCOPE WILL NOT BE PROPERLY GROUNDED, AND ELECTRIC SHOCK MAY RESULT.

CAUTION: REMOVE THE AC POWER PLUG FROM THE WALL SOCKET WHILE CHECKING FOR A BLOWN FUSE.

CAUTION: DO NOT ROLL THE MICROSCOPE OVER CABLES OR HOSES.

CAUTION: DO NOT REMOVE FERRITE BEADS IF APPLIED TO CABLES.

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7. EXPLANATION OF SYMBOLS



Caution: Observe all warning labels and notes! If any label in missing on your instrument or has become illegible, please contact the manufacturer to obtain new labels.



Brightness Control: After the illumination has been switched on, the user can continously adjust brightness by turning the knob appropriately.



Accompanying documents must be consulted.



Compliance to medical device directive 93/42/EEC.



Protective Earthing.



This way up – indicates the correct upright position of the transport package.



Keep dry – the transport package shall be kept away from rain.



Year of manufacture used on product data plate.



Fragile – contents of the transport package are fragile and should be handled with care.



Electromagnetic interference can occur in the vicinity of devices carrying this symbol.



Alternate current.



Permissible humidity range during transport and storage.



Permissible pressure range during transport and storage.



Recycling of packaging materials.



The product complies with US and Canadian safety requirements.



Permissible temperature range during transport and storage.



Separate disposal of waste electrical equipment.



Unsafe for use with MR (Magnetic Resonance).



Do not over balance more than 5°.

5v For Camera Power.



For ABA (Auto Balancing Arm) Power.

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8. STANDARDS AND DIRECTIVES

The instrument described in this user manual has been designed in compliance with the following standards:

- ISO 8600-3 First edition 1997-07-01 AMENDMENT 1 Optics and Optical instruments-Medical endoscopes and endoscopic accessories Part 3: Determination of field of view and direction of view of endoscopes with optics.
- ISO 8600-3 First edition 1997-07-01 Optics and Optical instruments-Medical endoscopes and endoscopic accessories Part 3: Determination of field of view and direction of view of endoscopes with optics.
- ISO 8600-5 First edition 2005-03-15 Optics and photonics-Medical endoscopes and endotherapy devices Part 5: Determination of optical resolution of rigid endoscopes with optics.
- ISO 9001/13485 and USFDA 21 CFR 820 Quality management systems approved by UL.
- ISO 14971-2007 Risk management to medical devices.

Directive Used

- Directives 93/42/EEC, Article II, Section 5, Annex VII.
- IEC 60601-1-3rd edition (2005)
- IEC 60601-1-2
- EN 55011:2007

Classifications

- For Europe, per Directive 93/42/EEC, the unit is a Class I instrument, per rule 12, Annex IX.
- For the United States, the FDA classification is Class I.
- Please observe all applicable accident prevention regulations.

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9. UNPACKING

The appliance is delivered in sub-assembled modular groups along with one Installation Kit and one user manual.

Please check for the following when unpacking the device:

1. Mobile Cross base in two parts with brakes on caster wheels or Ceiling Mount or Wall Mount as ordered.
2. Column, depending on the type of mount ordered (Floor or Wall/Ceiling).
3. Swivel arm and suspension arm assembly with fiber optic cable. Depending upon type of mounting (Floor or Wall/Ceiling).
4. Auto balancing Arm (ABA) with magnichanger assembly and NuVar CMO with Variable focal length.
5. Observation head Ergo tiltable 0-210°.
6. DBSI (Double Beam Splitter Inclined), Double Iris Diaphragm, Rotoplate.
7. DSLR Adapter with Mount for Sony or Canon or Nikon as ordered.
8. Pair of eyepieces as ordered.
9. Power cord.
10. Installation Kit
    a) Allen wrench 5 mm
    b) Allen wrench 8 mm
11. User manual
12. Paper template for location marking. (In case of Ceiling mount / wall mount only)

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10. INSTALLATION OF CROSS BASE (MOBILE STAND)

1. Open the box containing Cross Base Bottom as shown in Fig. 1.



Fig. 1

2. Take out the Cross bottom base and put it on floor as shown in Fig. 2.

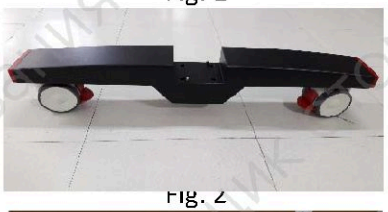


Fig. 2

3. Open the Box containing Cross Base Top as shown in Fig. 3.



Fig. 3

4. Take out the Cross Base Top and put it on floor as shown in Fig. 4.



Fig. 4

5. Refering Fig. 5. Align the Cross Base Top on Cross Base Bottom by aligning the guide pins in guide holes and Tighten the 4 screws provided.



Fig. 5

6. Assembled Cross Base will look like as shown in. Fig. 6



Fig. 6

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10.1 INSTALLATION OF MICROSCOPE (MOBILE STAND)

1. Open the microscope box. Take out (column) from the box. Mount the column onto a shaft in base by aligning the corresponding holes in Column (A) and shaft (B). Secure it with (3) M6x16mm Allen Screws (C) using 4mm Allen Key as shown in Fig. 7.

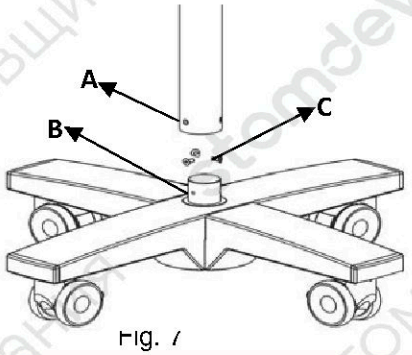


Fig. 7

2. Take out the Arm Assembly from the same box and follow the instructions below:
   a. Ensure that the swivel arm lock knob (D) is loosened.
   b. Mount the Arm assembly into the Shaft (F).
   c. Align three holes (E) with tapped hole on Shaft (F).
   d. Use Allen wrench 4mm and tighten 2 M6x16mm Allen screws (G).

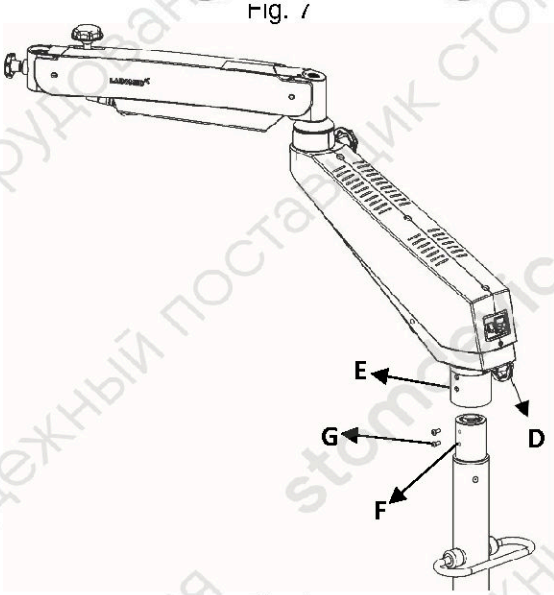


Fig. 8

3. Open another box and Take out the carrier assembly from its packaging following the instructions below:
   a. Insert the Auto balancing Arm (ABA) shaft (H) into the suspension arm as shown in Fig. 8.
   b. Lock the Auto Balancing Arm (ABA) with the threaded Knob (I) as shown in Fig. 8.
   c. Make sure the safety screw (1) is installed and tightened at position (2) so the coupling does not detach if knob (I) is accidentally unscrewed.

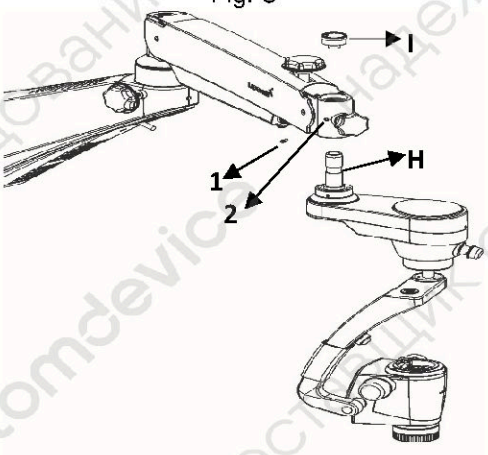


Fig. 8

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INSTALLATION OF MICROSCOPE (MOBILE STAND)

4. Install the standard accessories onto the carrier assembly as mentioned below:
   a. Loosen the M4 grub screw **(3)** by 2mm allen key and Fix Double iris diaphragm **(J)** on magnichanger by retightening the M4 grub screw.
   b. Loosen the M4 grub screw **(4)** by 2mm allen key on Double Iris Diaphragm and fix DBSi (Double beam splitter inclined) **(K)** and retighten the M4 grub screw.
   c. Remove the End cap from DBSi by rotating the ring **(5)** in anticlockwise and fix DSLR Camera adapter **(L)** by matching the slot and rotate the ring **(5)** clockwise to tighten the same. Loosen the knob **(6)** on DSLR adapter and fix the supplied Mount (Canon, Nikon, Sony **(L.1).** Retighten the knob **(6)** to secure C-mount.
   d. Loosen the M4 grub screw on DBSi by 2mm allen key and fix the Rotoplate **(M)**. Retighten the M4 grub screw.
   e. Loosen the M4 grub screw by 2mm allen key on Rotoplate and fix Ergo Head (0° - 210° tiltable) **(N)** and retighten the M4 grub screw.
   f. Fix both eyepieces **(O)** on ergo head.

***Note:** Please ensure the accessories were fixed properly to have better visual results.*

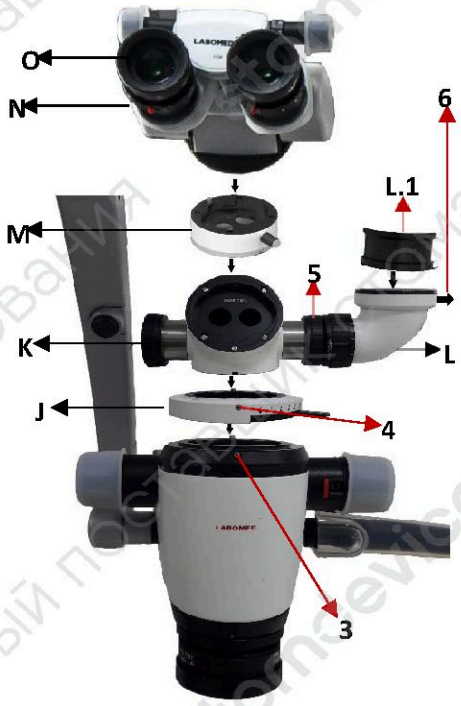


Fig. 9

5. Mount the light guide by completing the steps below:
   a. Switch off the illumination system.
   The light guide comes pre-routed through the swivel arm (which houses the LED illumination system) and the suspension arm).
   b. Remove the dust cap from the receptacle **(P)**.
   c. Insert the light guide into the receptacle **(P)** in the microscope until it clicks into position as shown in Fig. 10.
   d. Make sure the light guide has been routed in such a way that the carrier system and the surgical microscope are not obstructed and can be moved in their entire range of movement without stretching, kinking, or twisting the light guide.



Fig. 10

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10.2 ELECTRICAL CONNECTIONS

Connect the power cable to the AC inlet socket **(1)** located at the back of the swivel arm as shown in Fig. 11.

Switch on the power using the ON/OFF switch **(2)**.

NOTE: ***The power supply is designed with universal input 100V-240V AC, 50/60Hz. To plug in the power supply, follow the instructions on the product label (3) located at the bottom of the arm as shown in Fig. 11.***

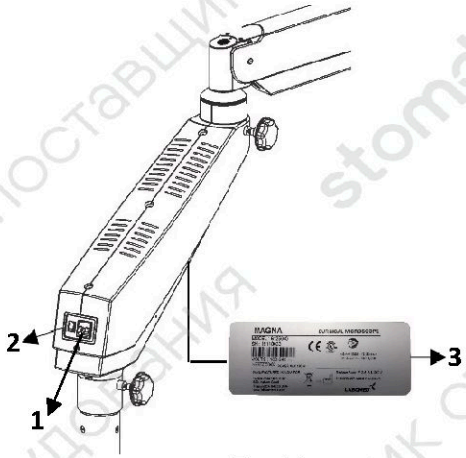


Fig. 11

1. **Replacing the Illumination source**
   a. Remove the swivel arm covers by unscrewing the screws in top and bottom as shown in Fig. 12.
   b. Remove the connections on the power supply and replace the illumination assembly **(A)** in Fig. 12 with a new assembly and refix the connections.
   c. Assemble back the arm covers.

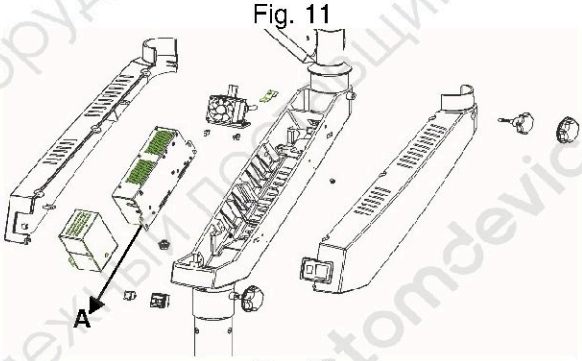


Fig. 12

2. **Replacing the Fuse**
   a. Locate the fuse at the AC inlet **(B)** as shown in Fig. 13.
   b. Use a flat head screw driver to open the fuse compartment **(C)**. Two fuses are provided: one is a live fuse and the second is a spare fuse.
   c. Replace the blown fuse with the spare fuse and close the fuse compartment.

NOTE: ***For proper ratings of Fuse used in microscope, refer to the label shown in Fig. 11.***



Fig. 13

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ELECTRICAL CONNECTIONS

3. Auto Balancing Arm Connections

a. Connect the 7 pin connector **(D)** at the 7 Pin female inlet **(E)** located in Suspension Arm for power in Auto Balancing Arm (ABA) as shown in Fig. 14.

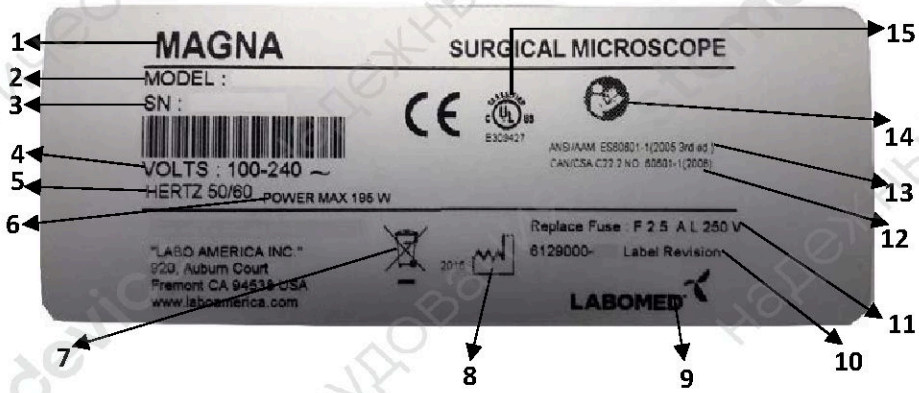
b. Take the power wire having 2 pin connectors on both sides and insert on the 2 pin inlet **(F)** located on Auto balancing Arm (ABA) and insert the other end of wire on to point as marked **( )** on Auto Balancing Arm (ABA) for powering operating clutch release as shown in Fig. 14.



Fig. 14

4. Label Details

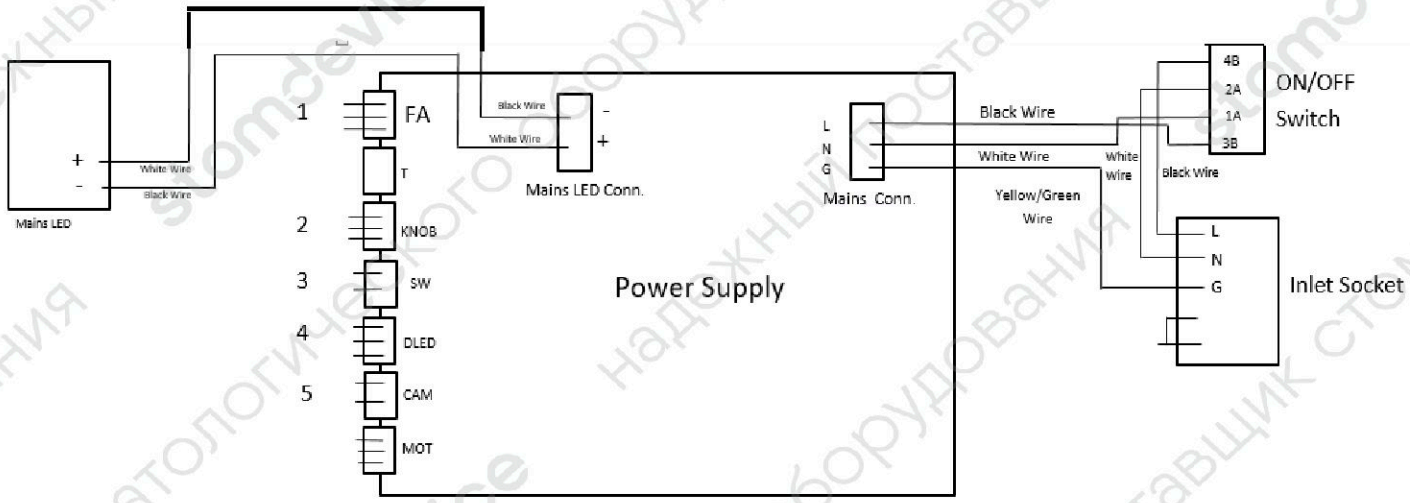
1. Device Name
2. Model No.
3. Serial No.
4. Input Voltage
5. Frequency
6. Max. Load
7. Separate Disposal Waste Electric Device
8. Manufacturer
9. Company Trademark
10. Label Control No.
11. Fuse rating
12. IEC60601-1:2005 Labeling for Canada
13. IEC60601-1:2005 Labeling for USA and Europe
14. Accompanying Document Must be consulted
15. UL Mark Safety Certification



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10.3 WIRING CODING DIAGRAM



Wire Marking No.	Power Supply Marking	Description
1	FAN	Main LED Fan Wire
2	KNOB	Potentiometer Wire
3	SW	Limit Switch Wire
4	DLED	Dual LED Wire
5	CAM	Camera Wire

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10.4 CONTROL ELEMENTS

1. ON / OFF Switch

The ON/OFF switch **(A)** is located at the back of the swivel arm. In the ON position, a green LED **(B)** glows, and the cooling fan starts running as shown in Fig. 14.

Set the intensity control knob **(C)** at the minimum intensity level before switching the system on as shown in Fig. 14.

To preserve the life of the LED, turn off the instrument when the microscope is not in use.

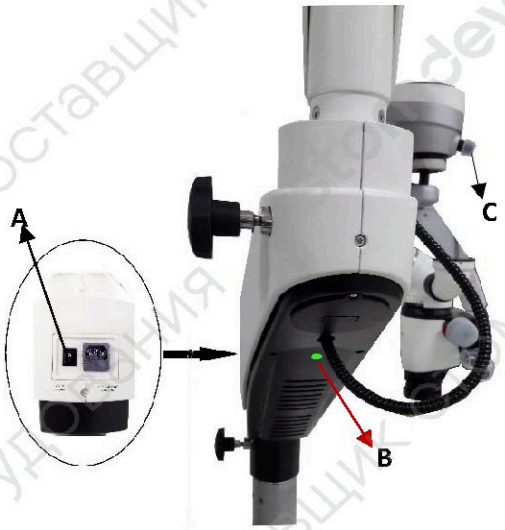


Fig. 14

2. Light Intensity Control Knob

The Light Intensity Control knob **(D)** is located at the front of the Auto Balancing Arm (ABA). The brightness of the field of view can be adjusted as desired using the intensity control knob as shown in Fig. 15.

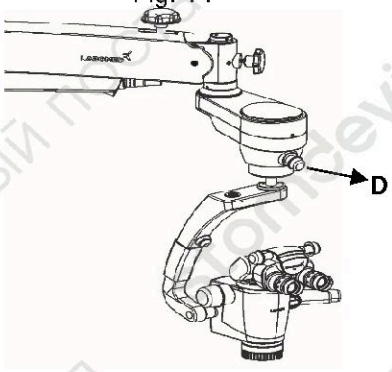


Fig. 15

3. Auto Balancing Arm (ABA) controls

a. Articulation of Auto balancing Arm (ABA) can be handled through two clutch release buttons located on left side **(E)** and right side **(F)** of carrier arm as shown in Fig. 16.

b. Pressing and holding down of the clutch button can articulate the Auto Balancing Arm (ABA) in any of the desired position. Release of clutch button can lock the Auto Balancing Arm in the desired position.



Fig. 16

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CONTROL ELEMENTS

4. Locking Knobs

a. Swivel Arm Locking Knob
This knob shown as **(G)** locks the movement of the Swivel arm at the desired position by turning it clockwise as shown in Fig. 17.

b. Suspension Arm Locking Knob
This knob shown as **(H)** locks the movement of the Suspension arm at the desired position by turning it clockwise as shown in Fig. 17.

c. Suspension Up/Down Movement Locking Knob
This knob shown as **(I)** locks the up/down movement of the Suspension arm at the desired height by turning it clockwise as shown in Fig. 17.

d. Auto Balancing Arm (ABA) Carrier Locking Knob
This knob shown as **(J)** locks the rotation of Auto Balancing Arm (ABA) at the desired position by turning it clockwise as shown in Fig. 17.

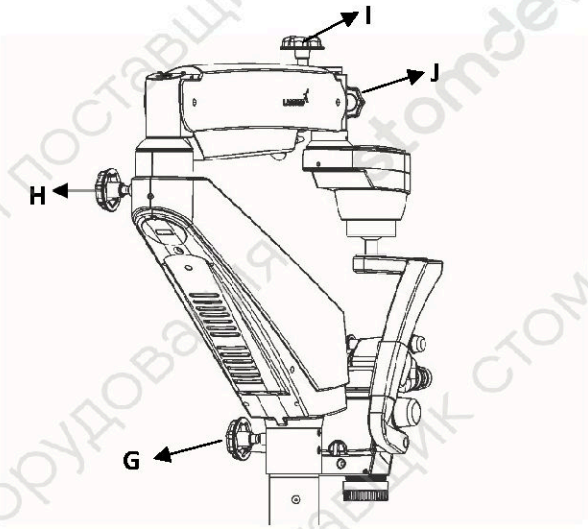


Fig. 17

5. Brakes

Lock the stand to prevent unwanted movement by pressing down all the four brakes **(K)** provided in the caster wheels and lift up the brakes to release the brakes as shown in Fig. 18.



Fig. 18

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11. USING THE MICROSCOPE

⚠ **WARNING:** MR **INSTRUMENT IS UNSAFE FOR MRI ENVIRONMENTS.**

Setting up the microscope:

a. For stability of microscope, lock all four brakes on the base caster wheels.
b. Optimize the Auto Balancing Arm (ABA) position by using clutch motions shown as **(A)** and **(A.1)** to get the proper field of vision as shown in Fig. 19.
c. Desired working distance can be obtained by rotating the ring shown as **(B)** on the variable objective lens. Fine focusing can be done by the same ring as shown in Fig. 19.
d. After focusing, lock swivel arm, suspension arm and ABA arm movements using lock knobs shown as **(C)** as shown in Fig. 19.
e. Adjust the inter-pupillary distance (IPD) of the eyepieces using the IPD adjustment knob shown as **(D)** in Fig. 19.
f. The illumination is controlled through the intensity control knob shown as **(E)**. Rotate it clockwise or anticlockwise to achieve the desired illumination level as shown in Fig. 19.

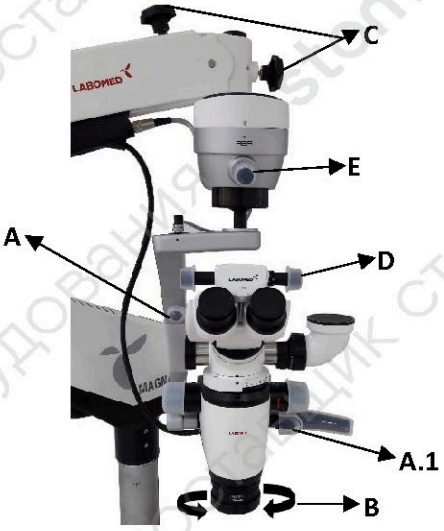


Fig. 19

Setting up the magnification:

a. Use the knobs **(F)** provided on the Magnichanger to select the desired magnification level.
b. Rotate these clockwise to increase and anticlockwise to decrease the level of magnification as shown in Fig. 20.

Conversion from continous zoom to Step magnification:

a. Pressing the Red click button (G) located besides the Magnification indicator will select the 8 step magnification. Pressing the same Red click button from reverse side to select the magnification in continous zoom as shown in Fig. 20.
b. Use the fine focusing by rotating the ring shown as (B) to achieve fine focus as shown in Fig. 19.
c. Use the Clutch Buttons shown as (A) on carrier arm and (A.1) on handle to center the area of interest in the field of view as shown in Fig. 19.



Fig. 20

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USING THE MICROSCOPE

Main Microscope Configuration:

Magna comes with standard accessories mentioned below:

- **a.** ***NuVar*** variable objective, focal length 300 – 400mm (standard).
- **b.** 0° - 210° tiltable ergo binocular tube.
- **c.** DBSi (Double beam splitter inclined).
- **d.** Double iris diaphragm.
- **e.** Rotoplate (0° - 20° of angle rotation).
- **f.** DSLR adapter & Mount for Canon, Nikon, Sony.

Standard configurations include eyepieces with a magnification factor of 10x (12.5x eyepieces are optional).



Fig. 21

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12. USE OF ACCESSORIES

Model: Magna

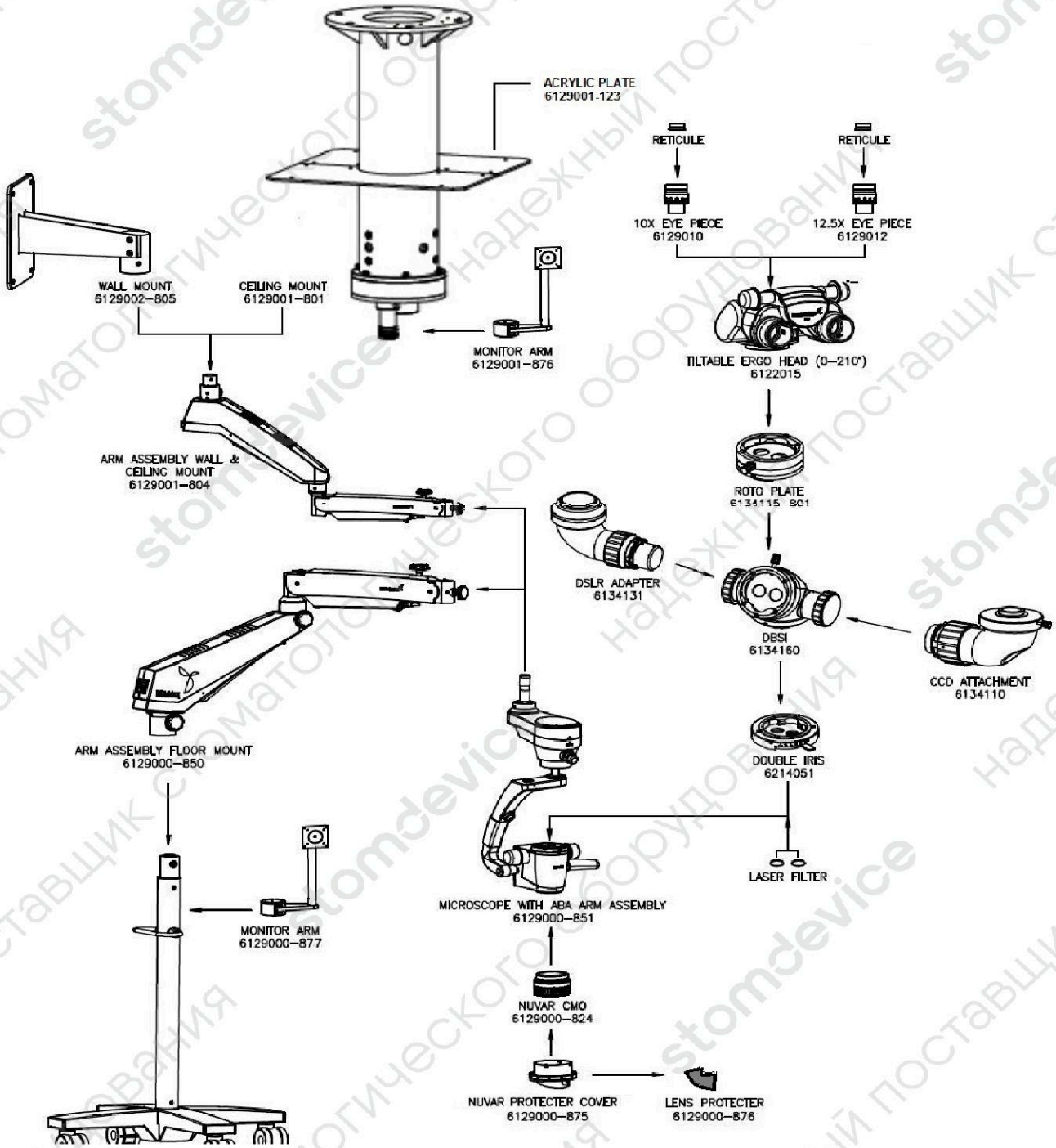


Fig. 22

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USE OF ACCESSORIES

1. **Rotoplate:** Rotoplate eliminates neck craning, making it comfortable to view hard to see region of mouth from 9 and 3'O clock seated position.

2. **DBSi (Double beam splitter inclined):** A beam splitter divides the light into two beams, it can be 50:50 or 80:20. In case of 80:20 ratio, 80% of light goes to observation head and 20% of light goes to camera accessories.

3. **Double Iris attachment:** An adjustable diaphragm attachment installed between Magnichanger and observation head or DBSi. It reduces incoming light and increase depth of field, it is very helpful for photographic imaging.

The following adapters can be attached to DBSi (Double Beam Splitter inclined) as per user requirement.

- **a.** DSLR camera adapter for Nikon, Canon and Sony cameras
- **b.** CCD camera adapter for Mintron camera.
- **c.** Adapter for Sony Handycam
- **d.** Assistoscope for assistant viewing

Attach the accessory to the left or right side of the beam splitter.

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13. THERMAL CUT-OFF

The instrument is designed with safety provisions. Fans in the electrical box provide free-and forced-air circulation to cool the electronic components. The instrument also includes a built-in-safety mechanism called ''auto thermal cut-off''. This mechanism is activated when the LED temperature rises above 70°C. This time power to the LED will be cut off. The LED indicator light will glow orange when auto thermal cut off has been initiated. Allow the LED to cool down before switching it on again.

14. TENSION ADJUSTMENT

If any optional accessories are added to the microscope, suspension arm tension must be adjusted to compensate for the additional weight.

1. **Tension Adjustment for Floor Mount**

a. Use an 8mm allen wrench in bolt **(A)** referring Fig. 23. Rotate it clockwise to increase the tension as desired. Rotate it counterclockwise to decrease the tension as desired.

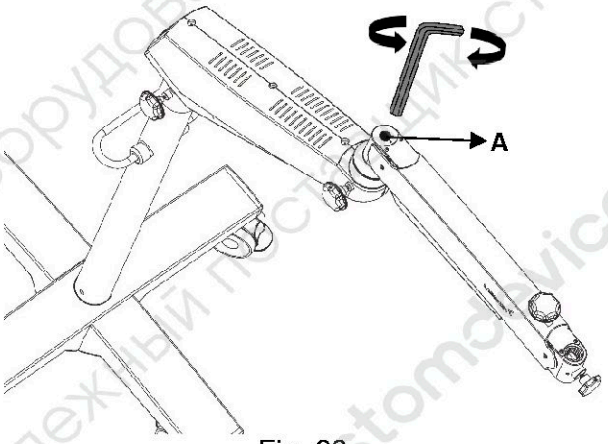


Fig. 23

2. **Tension Adjustment for Ceiling / Wall Mount**

a. Use an 8mm Box Spanner with long handle (LK-008 BS) as provided with microscope in bolt (B) referring Fig. 24. Rotate it clockwise to increase the tension as desired. Rotate it counterclockwise to decrease the tension as desired.

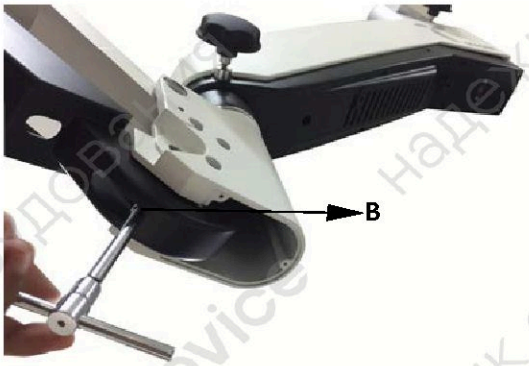


Fig. 24

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15. MOVING THE INSTRUMENT

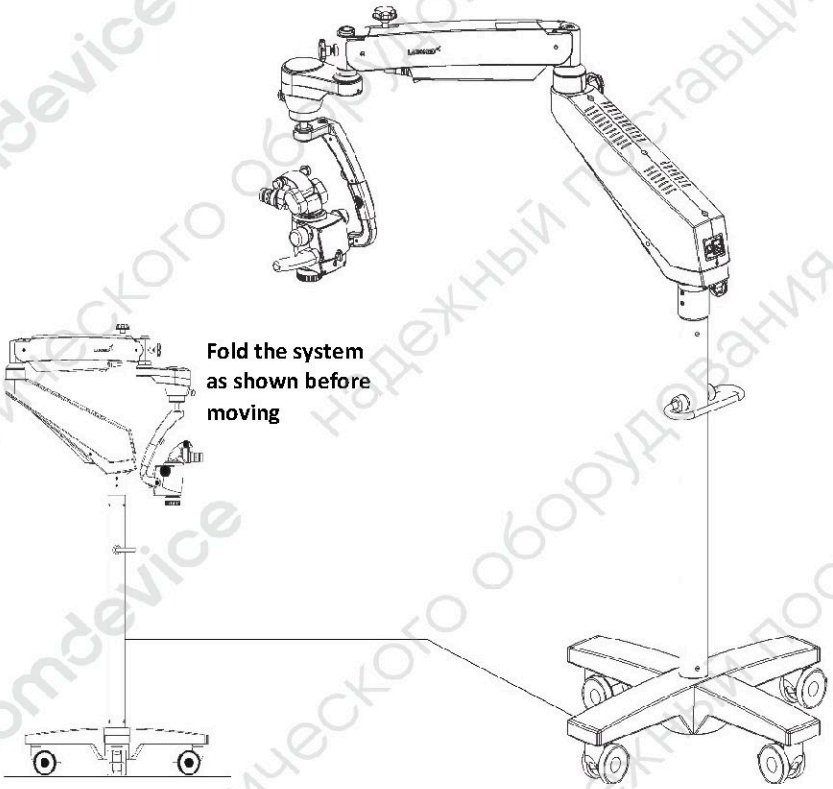


Fig. 24

Moving the Stand

1. Turn off the unit at the power switch.
2. Disconnect the power cable.
3. Remove the video cable from the video modules (e.g., video monitor, USB monitor) and the camera control unit.
4. Release the brakes.
5. Be careful when passing through doorways to avoid collisions of any kind. Do not move the instrument over steps or cables as the stand can topple. Be extremely careful when moving the instrument over slopes. Do not park the instrument on a slope.

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16. CARE AND MAINTENANCE

This instrument is a high grade technological product and does not require any special periodical maintenance if handled carefully. Still to ensure optimum performance and safe working order of the instrument, its safe functioning must be checked periodically as per table below. We recommend having this check performance by our service representative as part of regular maintenance work. If a failure occurs which you cannot correct using the trouble-shooting table, attach a sign to the instrument stating out of order and contact our service representative for servicing part or circuit diagram etc.

Surgical Microscope Maintenance / Service Check

Microscope: - **Owner: -** **Month: -** **Year:-**

Date of Purchase:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
DAILY AFTER USE																															
Wipe of any oily marks/finger prints from eye piece & CMO other Optical parts with lens paper																															
Turn off Microscope																															
Replace Dust Cover																															
Each Month																															
Clean microscope body with water moistened tissue																															
Use lens cleaning fluid on lens tissue to wipe lenses																															
Remove Fibre Optical Cable and clean																															
6 monthly																															
Service Inspection																															
Smooth Function of Locking Knobs																															
Smooth Functioning of Torque Adjustment Mechanism on Suspension Arm																															
Rotary Motion of Carrier																															
INITIALS																															

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CARE AND MAINTENANCE

Care Instructions

- Keep accessories away from dust when not in use, e.g. protect them with dust cover.
- Remove dust with a pneumatic rubber blower and soft brush.
- Use special optics cleaning cloths and pure alcohol for cleaning lenses and eyepieces.
- Protect your microscope from moisture, fumes, acids and cosmetic materials. Do not store chemicals close to the instrument.
- Protect it from improper handling. Never install other devices sockets or unscrew optical system and mechanical parts unless explicitly instructed to do so in this manual.
- Protect the microscope from oil and grease. Never oil or grease the guide surfaces or mechanical parts.
- Remove coarse contamination using a damp disposable cloth.
- Use disinfectants based on the following ingredients: aldehydes, alcohols, quaternary ammonium compounds.
- Camera: Clean optical components using a lint-free cloth. Soak the cloth using a little methanol or Glass cleaner. Do not use ethanol and spirit.
- Do not clean products and optical components in a cleaning/disinfecting device or ultra sound bath.
- **LABOMED MaxLite** coatings are fungal resistant. If you clean as described above, the coatings will not be damaged.

Tropical Environment / Fungus

LABOMED employs certain safety precaution in its manufacturing techniques and materials. Other preventive measures include:

- Keep optical parts clean.
- Use and store them in a clean, cool and dry environment only.
- Keep moisture away using silica gel and dust cover.

Occupational Safety and Health Protection

- Observe work safety and health protection of persons responsible for processing contaminated products.
- Current regulations of hospital hygiene and prevention of infection must be observed in the preparation, cleaning and disinfection of the products.

Instructions Workplace

- Remove surface contamination with a paper towel.

Autoclaving

The rubber caps, sleeves and grips supplied by labomed are recommend for the following program for autoclaving:

- Temperature: 134° C
- Time: 10 minutes
- Instrument: Standard Autoclave

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17. SCHEDULE OF AUTOCLAVABLE CAPS

Autoclavable Caps

Lock Knob Covers for Arm Movement:

1. Knob cover - Part no. 6168000 - 216
2. Knob cover - Part no. 6168000 – 216
3. Knob cover - Part no. 6168000 – 216
4. Knob cover - Part no. 6168000 - 216

Knob for Illumination Control:

5. Silicon Cover – P/N. 6122015-210

Knob for IPD (inter-pupillary distance):

6. Silicon Cover – P/N. 6122015-210

Knob for Clutch Handle (right side):

7. Silicon Cover – P/N. 6129000-232

Knob for Zoom:

8. Silicon Cover – P/N. 6129000-220

Cover for Clutch Handle (left side):

9. Silicon Cover – P/N. 6129000-216

Cover for Clutch Button:

10. Silicon Cover – P/N. 6129000-233

***NuVar* Protective Cover: (w/o Lens)**

11. P/N. 6129000-875

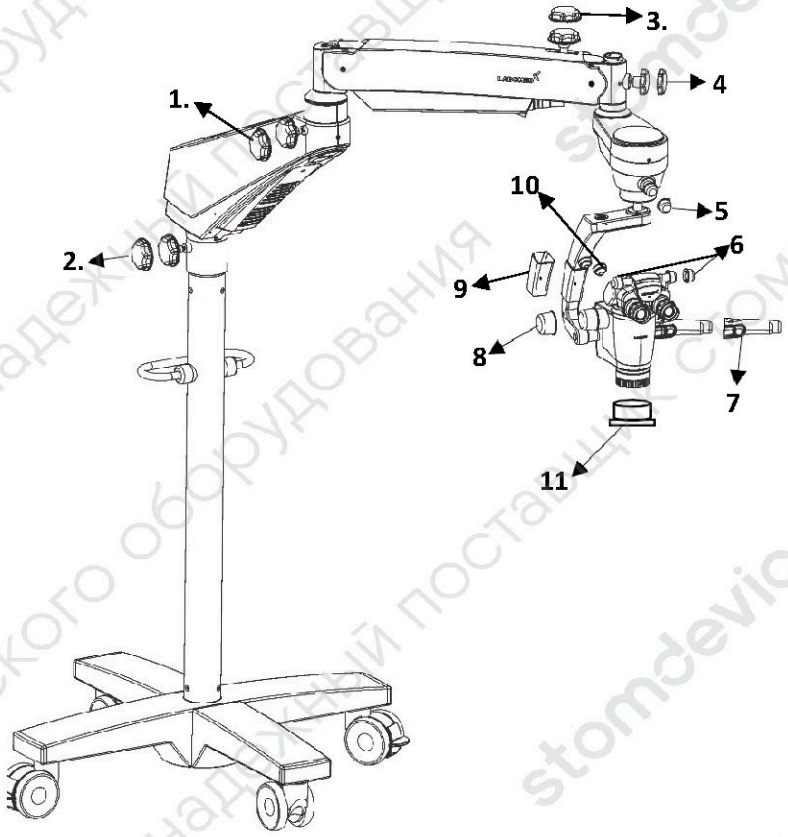


Fig. 25

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18. AMBIENT REQUIREMENT

For Operation	Temperature Rel. Humidity (without condensation) Air Pressure	+ 10°C…..+40°C 30%.....90% 700hPa…….1,060hPa
For Transportation and Storage	Temperature Rel. Humidity (without condensation) Air Pressure	-10°C…..+40°C 30%.....90% 700hPa…….1,060hPa

The unit meets the essential requirements stipulated in Annex I of the 93/42/EEC directive governing medical devices. The unit is marked with CE and is compliant to ANSI / AAMI EC 60601 – 1:2005.

19. DISPOSAL

Disposal of the instrument must comply with locally applicable laws and regulations.

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20. TECHNICAL SPECIFICATIONS

1.	**Stand**	Robust, vibration-free stand on a cross base with four lockable caster wheels
2.	**Binocular Tubes**	0 - 210° tiltable head configured with Rotoplate, DBSi (Double Beam Splitter Inclined, Double Iris Diaphragm and DSLR Adapter
3.	**IPD Adjustment**	50 – 75mm
4.	**Eyepieces**	WF 10x/18mm lockable eyepieces, one with resolution mark to assist in diopter adjustment
5.	**Diopter Adjustment**	± 5mm with diopter lock
6.	**Apochromatic Magnichanger**	Galilean Zoom 1:6, convertible to 8 step Magnichanger
7.	**Zoom Range**	0.4 – 2.5x
8.	**Objective**	***NuVar*** system with variable focal length adjustment from 300 – 400 mm with fine focus
9.	**Light Source**	50 Watt LED
10.	**Input Voltage**	90 – 240V
11.	**Maximum Wattage**	195 Watts
12.	**Built in Filters**	Yellow and Green
13.	**Vertical Movement of Arm**	± 250mm, power saving feature with light cut-off in park position
14.	**Microscope Carrier**	ABA (Automatic Balancing Arm with electromagnetic release for easy, drift-free positioning
15.	**Mounting Options**	Floor Stand, Wall Mount and Ceiling Mount

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21. TROUBLESHOOTING TABLE

Problem	Possible Cause	Remedy
No illumination	Power cable not pluged in	Plug in power cable
	Power switch in OFF position	Press the power switch to ON position
	Defective instrument fuse	Change the fuse
	Defective power cable	Change the power cable
	Line power failure	Contact in-house technician
	Failure of suspension system electronics	Contact the service department
Insufficient illumination	Brightness level set too low	Adjust the brightness control knob
	Light guide not properly inserted in arm of microscope	Insert the light guide properly to get maximum illumination
	Defective light guide (illumination not uniform)	Change the light guide
Inoperative surgical field illumination	Inoperative surgical field illumination	Insert the light guide as far as it will go
	Failure of electronics	Illuminate the surgical field using an alternate illuminator, and contact the service department
	Switch off via limitswitch on suspension arm system	Move the suspension system into the working position
Insufficient illumination (continued)	The thermal cut-off in the lamp housing is contaminated	Clean the thermal cut-off with a dry brush or blow it clean, with compressed air
	Defective fan; failure of system electronics	Contact the service department
Up and down motion of the suspension system is stiff	The friction adjustment screw on the suspension system is tightened too firmly	Loosen the friction adjustment screw on the suspension system as needed

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TROUBLESHOOTING TABLE

Problem	Possible Cause	Remedy
Stand is unstable	The brakes on the wheels are not in use	Engage the brakes
No image is visible in the field of view	Magnichanger is not indexed properly	Rotate the Magnichanger to click a stop

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22. GUIDANCE TABLES

Guidance and Manufacturer's Decleration		
Electromagnetic Emissions		
All Equipment and Systems		
Guidance and Manufacturer's Decleration – Electromagnetic Emissions		
Magna is intended for use in the electromagnetic environment specified below. The customer or user of the Magna should ensure that it is used in such an environment.		
Emissions Test	**Compliance**	**Electromagnetic Environment Guidance**
RF Emissions CISPR 11	Group 1	The Magna 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.
Harminics IEC 61000-3-2	Class A	The Magna is suitable for use in all establishments, other than domestic, and those directly connected to the public low voltage power network that supplies buildings used for domestic purposes.
Flicker IEC 61000-3-3	Complies	

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GUIDANCE TABLES (continued)

Guidance and Manufacturer's Decleration

Electromagnetic Emissions

All Equipment and Systems

Guidance and Manufacturer's Decleration – Electromagnetic Emissions

Magna is intended for use in the electromagnetic environment specified below. The customer or user of the Magna should ensure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment Guidance
ESD IEC 61000-4-2	±8kv contact ±15kv Air	±8kv Contact ±15kv Air	Floors should be wood, concrete or ceramic tile. If floors are synthetic, the R/H should be at least 30%.
EFT IEC 61000-4-4	±2kv mains ±1kv I/Os	±2kv mains ±1kv I/Os	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kv Differential ±2kv Common	±1kv Differential ±2kv Common	Mains power quality should be that of a typical commercial or hospital environment.
Voltage Dips/Dropout IEC 61000-4-11	>95% Dip for 0.5 Cycle 60% Dip for 5 Cycles 30% Dip for 25 Cycles > 95% Dip for 5 Second	>95% Dip for 0.5 Cycle 60% Dip for 5 Cycles 30% Dip for 25 Cycles > 95% Dip for 5 Second	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Magna requires continued operation during power mains interruptions, it is recommended that the Magna be powered from an uninterruptable power supply or battery.
Power Frequency 50/60Hz Magnetic Field IEC 61000-4-8	30A/m	30A/m	Power frequency magnetic fields should be that of a typical commercial or hospital environment.

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GUIDANCE TABLES

Guidance and Manufacturer's Decleration

Electromagnetic Immunity

Equipment and Systems that are NOT Life-Supporting

Guidance and manufacturer's Decleration – Electromagnetic Immunity

The Magna is intended for use in the Electromagnetic environment specified below. The customer or user of the Magna should unsure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic environment guidance
Conducted RF IEC 61000-4-6	3 vrms 150 kHz to 80 MHz	(v1) = 3 vrms	Portable and mobile RF communications equipment should be used no closer to any part of the Magna, including cables than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3	80 MHz to 2.7 GHz @ 3V/m	(E1) = 3 vrms	**Recommended Seperation Distance:** **d=(3.5/v1)(Sqrt P)** **d=(3.5/E1)(Sqrt P)** **80 to 800 MHz** **d=(7/E1)(Sqrt P)** **800 MHz to 2.7 GHz** Where P is the max output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance levels in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol. 

Note 1: At 80 MHz to 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.
*Field strengths from fixed transmitters, such as base stations for radio(cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To access the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. The measured field strength in the location in which the ME Equipment or ME System should be observed 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.
* Over the frequency range 150kHz to 80 MHz, field strengths should be less than [V1] V/m.

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GUIDANCE TABLES (continued)

Recommended separation distances between portable and mobile RF communications equipment and the Magna for ME equipment and ME systems that are not Life-supporting.

Guidance and Manufacturer's Decleration – Electromagnetic Immunity

Recommended separation distances for between Portable and Mobile RF Communications equipment and the Magna

The Magna is intended for use in electromagnetic environments in which radiated RF disturbances are controlled. The customer or user of the Magna can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Magna as recommended below, according to the maximum output power of the communications equipment.

Max Output Power of Transmitter (W)	Seperation (m) 150kHz to 80 MHz d=(3.5/v1)(Sqrt P)	Seperation (m) 80 to 800 MHz d=(3.5/E1)(Sqrt P)	Seperation (m) 800 MHz to 2.5Ghz d=(7/E1)(Sqrt P)
0.01	0.1166	0.1166	0.2333
0.1	0.3689	0.3689	0.7378
1	1.1666	1.1666	2.3333
10	3.6893	3.6893	7.3786
100	11.6666	11.6666	23.3333

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, the separation distance for the higher frequency range applies.

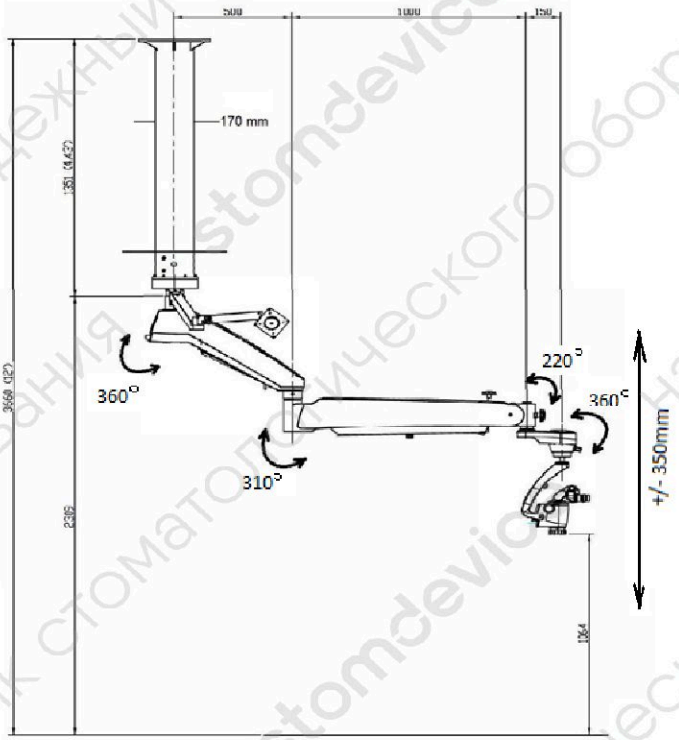
Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

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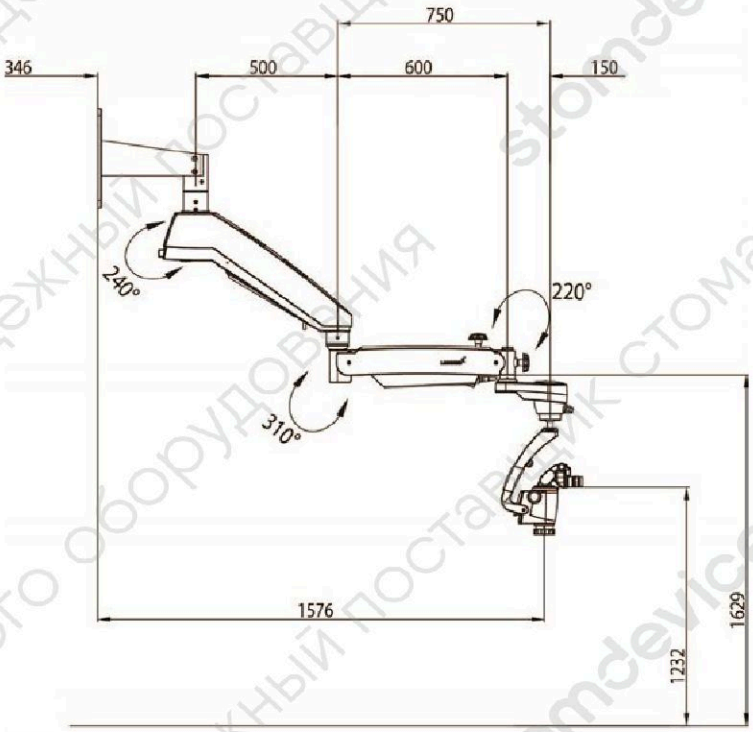
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23. DIMENSIONS AND WEIGHT

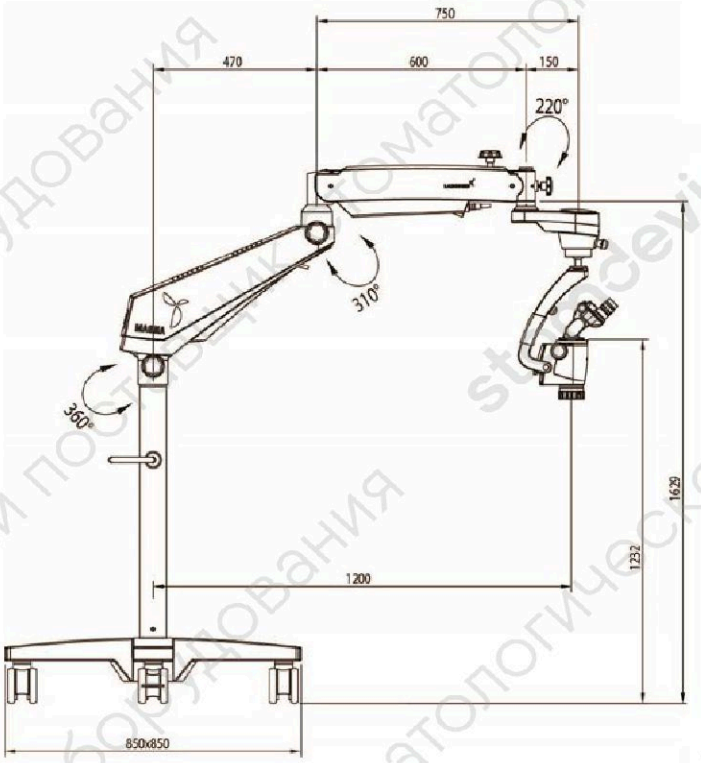
Ceiling Mount



Wall Mount



Floor Stand



Configurations		Weight
Magna with Wall Mount		
a. Wall Bracket	:	10 Kg
b. Shaft	:	07 Kg
c. Magna Arm Long/Short	:	28 Kg/22 Kg
d. Magna Carrier	:	10 Kg
Magna with Ceiling Mount		
a. Ceiling Mount	:	30 Kg
b. Magna Arm Long	:	28 Kg
c. Magna Carrier	:	10 Kg
	:	
Magna with Floor Stand		
a. Cross Base (Top)	:	48 Kg
b. Cross Base (Bottom)	:	48 Kg
c. Column	:	12 Kg
d. Magna Arm Short	:	22 Kg
e. Magna Carrier	:	10 Kg

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24. GLOSSARY

Ametropia Compensation	Compensation of short-or-far-sightedness. This can be done for each eye using the two individual eyepieces (range: +5 to -5 diopters).
Working Distance	Distance from the common main objective (CMO) to the object or area of interest.
Color Temperature	Refers to the color characteristic of a light source. Using color temperature, one can set the color of a light source to warm or cold light relative to the color of natural light. The unit of measure for color temperature is Kelvin (K).
Field of View Diameter	The visible area of an object that can be seen through the microscope. The greater the magnification level, the smaller the field of view and vice versa.
Green Filter	A color filter that darkens red and blue light and brightens green light. This improves the contrast of the image with red tones, improving the visibility of blood vessels.
Illumination Intensity	Specifies the luminous flux from a light source onto a certain area. The unit of measure for illumination intensity is Lux (Lx).
LED	Light Emitting Diode. Electronic semiconductor device that emits light when an electrical current passes through it.
Eyepiece	The optical tubes through which the enlarged image produced by the microscope can be viewed.
Convergent Beam Path	The tow light beams for the right and left eye run together at a point that lies at a distance from the common main objective (CMO). This distance is equal to the working distance.
White Balance	White balance is used to calibrate the camera to the color temperature of the light at the location.
DSLR Camera	(Digital Single Lens Reflex) camera with a digital imaging sensor.
CCD Camera	(Charged Coupled Device) camera with a technology to store a charge and move this charge out of the photo sensor in an organized way.
CMOS Camera	(Complementary Metal Oxide Semiconductor) camera in which image sensor is a silicon chip that captures and reads light.
DBS	(Double Beam Splitter) splits light beam into two directions (one to eye and one to side port) for simultaneous user viewing and photography, videography, or co-observation. Ratio of light distribution is 70% for eyes and 30% to side ports for photography, videography and co-observation.
Rotoplate	The Rotoplate reduces neck craning, making it comfortable to view hard to see regions of the mouth from the 9 and 3 oclock seated positions.
Double Iris Diaphragm	The double iris diaphragm kit allows greater depth of field, which is particularly valuable for photography.
IPD	Inter Pupillary Distance

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25. WARRANTY

This product is warranted by LABOMED against defective material and workmanship under normal use for a period of one year from the date of invoice to the original purchaser. (An authorized dealer shall not be considered the original purchaser). Under this warranty, LABOMED's obligation is to repair or replace the defective part or product at LABOMED's discretion.

This warranty applies to new products and does not apply to a product that has been tampered with, altered in any way, misused, damaged by accident or negligence, or which has had the serial number removed, altered, or effaced. Nor shall this warranty be extended to a product installed or operated in a manner not in accordance with the applicable LABOMED instruction manual, nor to a product which has been sold, serviced, installed, or repaired other than by a LABOMED factory or authorized LABOMED Dealer.

All claims under this warranty must be in writing and directed to the LABOMED factory or its authorized dealer for this device making the original sale and must be accompanied by a copy of the purchaser's invoice.

This warranty is in lieu of all other warranties implied or expressed. All implied warranties of merchantability or fitness for a particular use are hereby disclaimed. No representative or other person is authorized to make any other obligations for a LABOMED product. LABOMED shall not be liable for any special, incidental, or consequent damages for any negligence, breach of warranty, strict liability, or any other damages resulting from or relating to design, manufacture, sale, use, or handling of the product.

PRODUCT CHANGES

LABOMED reserves the right to make changes in design or to make additions to or improvements in its products without obligation to add such to products previously manufactured.

CLAIMS FOR SHORTAGES

We use extreme care in selection, checking, rechecking, and packing to eliminate the possibility of error. If any shipping errors are discovered:

1. Carefully go through the packing materials to be sure nothing was inadvertently overlooked when the unit was unpacked.
2. Call the dealer you purchased the product from and report the shortage. The materials are packed at the factory and none should be missing if the box has never been opened.
3. Claims must be filed within 30 days of purchase.

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WARRANTY (continued)

CLAIMS FOR DAMAGES IN TRANSIT

Our shipping responsibility ceases with the safe delivery in good condition to the transportation company. Claims for loss or damage in transit should be made promptly and directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If within 48 hours of delivery, concealed damage is noted upon unpacking the shipment and no exterior evidence of rough handling is apparent, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order for the dealer to maintain the right of recovery from the carrier.

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Revision History

Rev. No.	Date of Release	DCR #	Change	Appd. By
1.2	March 1, 2018		Removal of Protector Lens cover Assy. for Autoclavable list on Page No. 40	
1.3	April 1, 2018		Addition of Protector Lens cover Assy. for Autoclavable list on Page No. 40	

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