MINI POINT CO_2 Micromanipulator

Operating Instructions

KLS martin
GROUP

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1 Introduction

1.1 General Information

Welcome to your KLS Martin MINI POINT laser micromanipulator.

The MINI POINT is used for microsurgery in special fields such as gynecology, proctology, ENT and dermatology.

With the appropriate adapters, you can connect your MINI POINT and your CO_2 infrared surgical laser to a large range of OR microscopes or colposcopes. As a lens-based light transmitting device, the MINI POINT has many important performance, operating and cost advantages compared to other CO_2 laser micromanipulators.

This manual provides in-depth information about the functionality, installation and operation of the MINI POINT micromanipulator, enabling you to make the best possible use of the unit. Detailed maintenance and cleaning instructions guarantee in addition that your MINI POINT will work reliably and smoothly.

NOTICE!

Should you have any questions regarding the operation and maintenance of your MINI POINT, please contact Gebrüder Martin's authorized service partner.

1.2 Lens-Based CO_2 Laser Light Delivery

The MINI POINT enables surgical laser light to be transmitted and controlled by means of a lens system. The latter uses an arrangement of several optical lenses to focus the laser beam.

Mirrors are used to reflect the laser beam into the aiming or pilot beam. The sole purpose of the aiming beam is for positioning the laser beam.

The visible, red aiming beam is directed at the tissue and focused. The focus of the CO_2 laser beam now lies inside the red aiming beam (Fig. 1.1). Minor deviations result from the slightly different focal lengths of the lens systems for the red aiming beam and the infrared CO_2 beam. These deviations are negligible and can be ignored for practical purposes.

An aiming beam is a standard feature of the following CO_2 laser units: MCO25, MCO50, MCO25plus and MCO50plus. For use with the MINI POINT, we recommend in particular the aiming beam version for scanner operation.

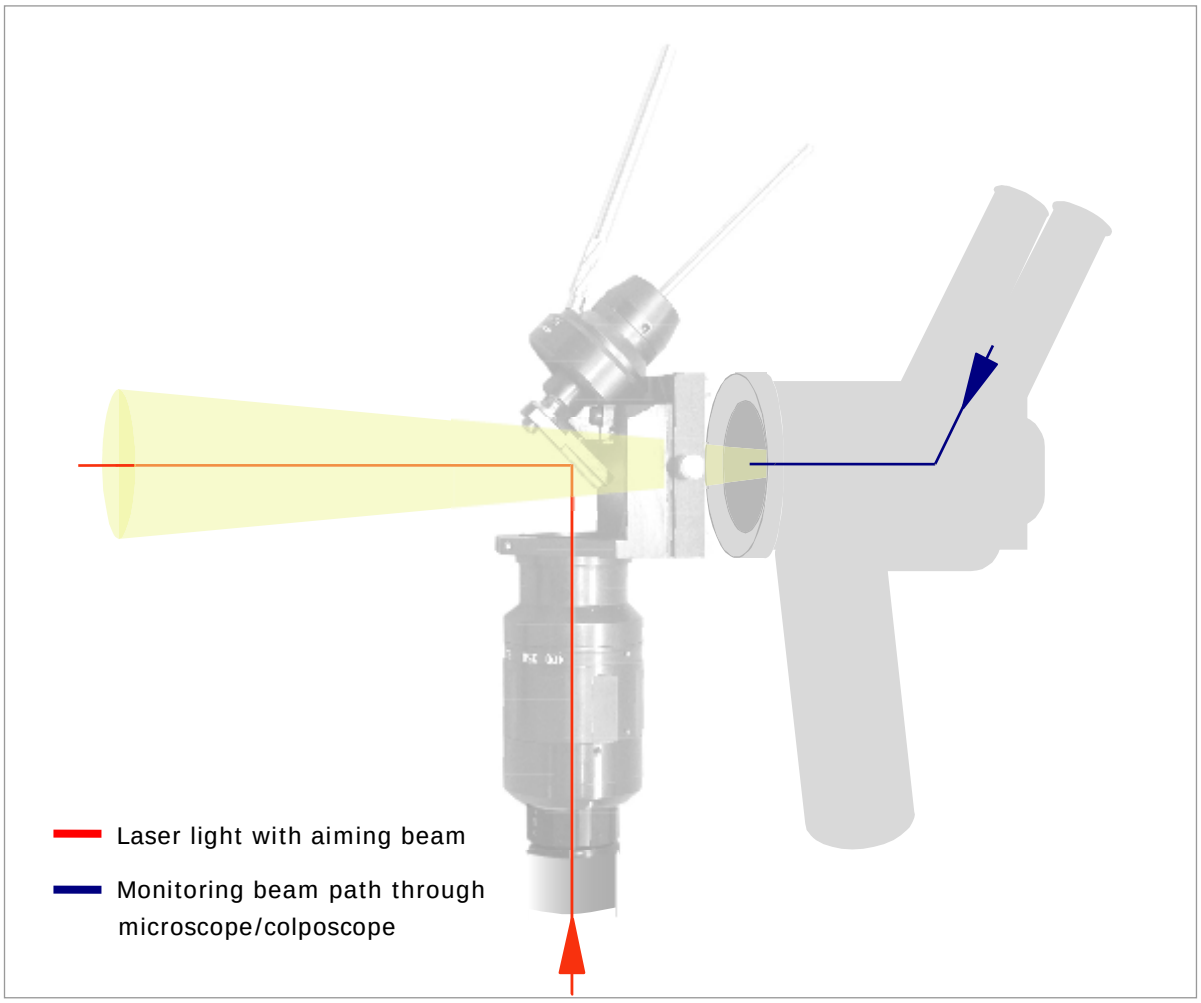

Fig. 1.1 MINI POINT function diagram: laser light with aiming beam and colposcope (schematic)

1.3 MINI POINT Operating Advantages

With the MINI POINT it is easy to bring together the monitoring beam path with the paths of the CO_2 laser beam and the aiming beam. The focal/working distance can be easily adjusted with the zoom ring.

Thanks to its great flexibility, the MINI POINT can be adapted for use with numerous OR microscopes, colposcopes and CO_2 lasers.

Combined with a KLS Martin CO_2 laser, the MINI POINT is extremely versatile. The quick-lock adapter plate is usually left in place on the microscope so that there is no need for additional mounting. The quick-lock feature guarantees fast and reliable adaptation.

The MINI POINT produces very small spot sizes across the entire focal length range from 200 mm to 400 mm.

2 Intended Use

The MINI POINT micromanipulator was developed and designed for microsurgical procedures. Typical applications are to be found in gynecology, proctology, dermatology and ENT.

The MINI POINT micromanipulator may be used solely for laser interventions in conjunction with a microscope or colposcope.

A wavelength of 10600 nm and a power limit of 50 watts must be assured for the MINI POINT to work correctly.

Be sure to use only KLS Martin CO_2 lasers. KLS Martin products are matched in terms of their power parameters and mechanical connections.

Before you use any other makes of laser or laser equipment, it is imperative to obtain express permission from Gebrüder Martin.

ATTENTION!

Gebrüder Martin accepts no liability for any damage to materials or injury to health caused by non-intended use!

3 Safety

3.1 Warnings and Operational Cautions

The MINI POINT micromanipulator is intended for use by physicians and medical personnel trained in the operation of surgical lasers.

It is assumed that all persons who operate the MINI POINT micromanipulator have read and fully understood the operating and safety instructions issued for the microscope and the laser system being used.

The safety regulations governing the lasers and microscopes in question must be observed as well.

ATTENTION!

The following notices on the safe operation of laser units must be strictly observed!

Failure to do so will endanger life and limb! Also, damage to equipment cannot be ruled out.

Be sure to enter the MINI POINT micromanipulator in your CO_2 laser equipment log.

The MINI POINT must be inspected annually as part of the safety check carried out on your laser.

ATTENTION!

To ensure reliable and smooth operation, be sure to observe the maintenance instructions provided in Section 8 (page 23)!

The focal power density depends on the laser power and the spot diameter. The spot diameter varies with the focal/working distance.

Consequently, resetting the zoom ring changes the focal power density and thus the effect of the laser beam on the tissue. Similarly, a different power setting on the laser unit will also change the laser's effect on the tissue. Both aspects must be considered when you set the MINI POINT.

ATTENTION!

Protective eyewear (anti-laser goggles) must be worn at all times, even at a large distance from the laser beam.

This applies in particular to operating personnel and any other persons present in the laser area.

Never activate the CO_2 laser in the presence of flammable anesthetics. Risk of fire and explosion!

3.2 Conformance with Safety Regulations

The MINI POINT is CE-marked and therefore complies with the Medical Devices Directive (MDD).

3.3 Power Density Versus Beam Spot Size

The spot diameter depends on the focal length used. The laser power density is defined as power per unit area. The power density thus increases as a function of the reciprocal diameter by the power of two. This means that changing the focus diameter greatly affects the laser's impact on the tissue. The highest power densities are obtained with the shortest focal length of 200 mm.

It is customary to use a microscope or colposcope with a fixed focal length or with a focal length always set to the same value. In this case the working distance remains the same and the MINI POINT is operated with a fixed focal length. The spot diameter is also kept constant as a result.

3.4 Smoke Evacuation

The smoke (plume) generated during laser interventions is partly invisible and noxious.

As a potential hazard affecting occupational safety, the laser plume should be evacuated. Any commercial smoke evacuator designed for use with surgical lasers may be used in conjunction with the MINI POINT micromanipulator.

NOTICE!

Gebrüder Martin recommends the product "Atmosafe" from Atmos.

Atmosafe can be ordered from Gebrüder Martin.

3.5 Markings

The one warning label on the MINI POINT is shown in Fig. 3.1. Never stare into the laser aperture when the laser system is energized.

Fig. 3.1 "Laser aperture" warning label

MNP 0400 06 0105

Fig. 3.2 Serial number of the MINI POINT (example)

Please quote the serial number whenever you have any questions regarding your MINI POINT or when getting in touch with Gebrüder Martin's Technical Service.

4 Components

4.1 Scope of Supply

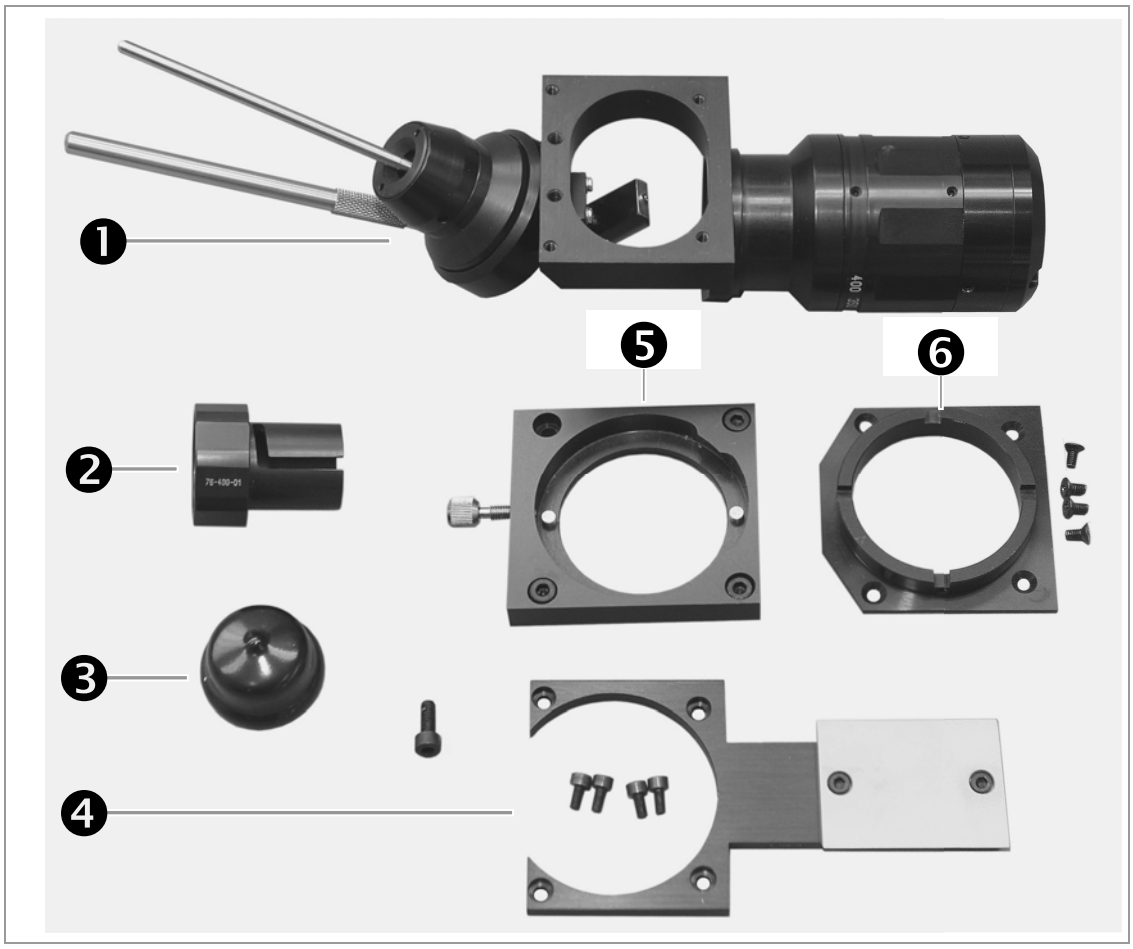

Fig. 4.1 Scope of supply of the MINI POINT

Your MINI POINT is delivered with the following parts (shown in Fig. 4.1):

Item 1 MINI POINT micromanipulator 200–400 mm, item number 76-400-00

Item 2 Adapter for laser arm, item number 76-400-01

Item 3 Protective cap for laser use

Item 4 Zeiss dovetail microscope adapter with four M3x6 Allen screws, item number 76-400-14

Item 5 Quick-change plate for microscope adapter plates, with screws, item number 76-400-02

Item 6 Quick-change plate for mounting on the MINI POINT (alternative to Item 4)

Using the adapters supplied, you can connect your MINI POINT to an MCO25, MCO50, MCO25plus or MCO50plus laser as well as to a Zeiss operating microscope via the dovetail mount.

4.2 Design

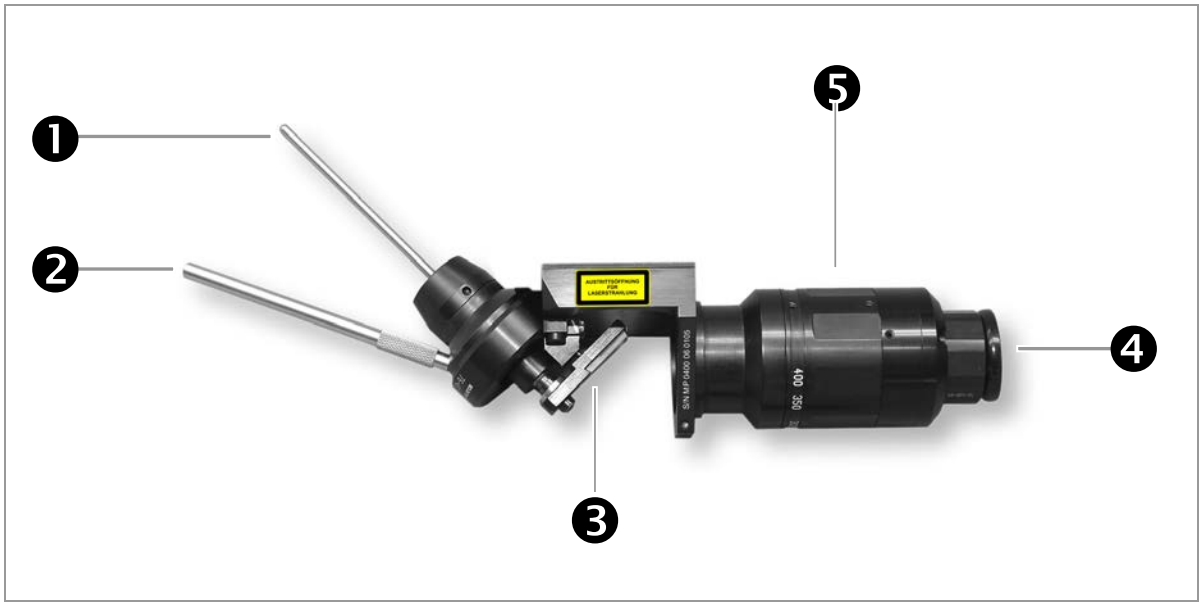

Fig. 4.2 Main components of the MINI POINT

Item 1 Joystick

Item 2 Hand rest

Item 3 Laser mirror

Item 4 Adapter for connecting to the laser

Item 5 Laser lens with focal length setting from 200 to 400 mm

4.3 Accessories

4.3.1 Soft Scan Plus Adapter

An adapter for connecting up the Soft Scan Plus of the MCO25plus laser and MCO50plus laser is available so that you can scan with the MINI POINT micromanipulator. The adapter is fitted to the MINI POINT in place of the laser connection (Fig. 4.3, Item 4).

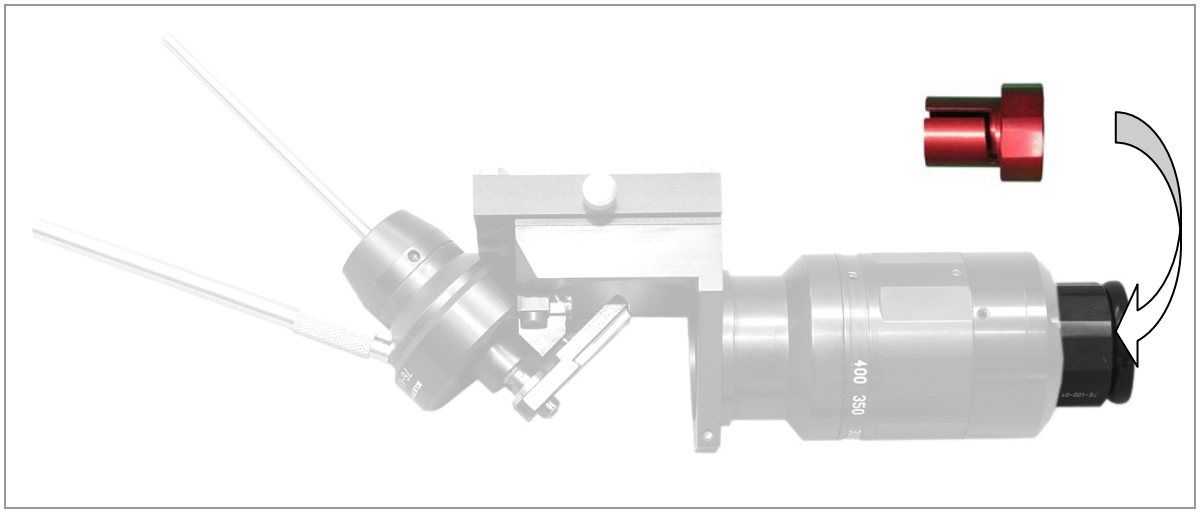

Fig. 4.3 Connector for "Soft Scan Plus", item number 76-500-41

4.3.2 Microscope Adapters

The following adapter plates are available for frequently used microscopes:

Manufacturer/Microscope model	KLS Martin adapter plate item number
Kaps SOM 42	76-400-11
Kaps SOM 52	
Kaps SOM 62	76-401-11
Leica M500	76-400-16
Leica M840/841	
Leica M690/691/695	76-400-13
Leica M650/651/655	
Leica M400E	
Moeller-Wedel VM 500	76-400-15
Zeiss OPMI Sensera	76-400-10
Zeiss OPMI 111/MDO/MDU	
Zeiss OPMI 6	
Zeiss OPMI 11	
Zeiss OPMI 19 FC	
Zeiss OPMI ORL	
Zeiss OPMI MDM	
Zeiss OPMI Vario	
Zeiss PRO MAGIS	
Zeiss OPMI FC 1	76-400-14
Olympus OCS-500	76-400-17
Colposcope Zeiss 150 FC	76-400-18

More adapter plates for other operating microscopes and colposcopes are available on request.

5 Preparing the MINI POINT for Use

5.1 Completing the Assembly

To identify the components and accessories of your MINI POINT, see Section 4.2 “Design” and Section 4.3 “Accessories”.

To complete the assembly, proceed as follows:

- Adjust the hand rest for right-handed or left-handed users. To do so, loosen the hand rest slightly and turn the ring fastener until the hand rest is in the preferred position. Secure the hand rest in place by turning clockwise.
- Select the adapter to match the type and design of the microscope or colposcope in question – see Section 4.3.2 "Microscope Adapters".
- If you want to use the "Soft Scan Plus" scanner, connect the scanner to the MINI POINT using the adapter ring with the item number 76-500-41 – see Section 4.3.1 "Soft Scan Plus Adapter".

ATTENTION!

Each time before you use the MINI POINT, inspect the exterior for signs of damage or foreign material. If you discover any damage, notify Gebrüder Martin’s authorized service partner without delay.

For details of how to clean the housing and the lens system, see Section 8 "Maintenance and Warranty".

5.2 Attaching the MINI POINT to the Microscope / Colposcope

Once you have selected and fitted the correct adapter for the microscope or colposcope model, you can join the units together. A dovetail adapter for Zeiss microscopes is available in addition to the two adapter quick-change plates.

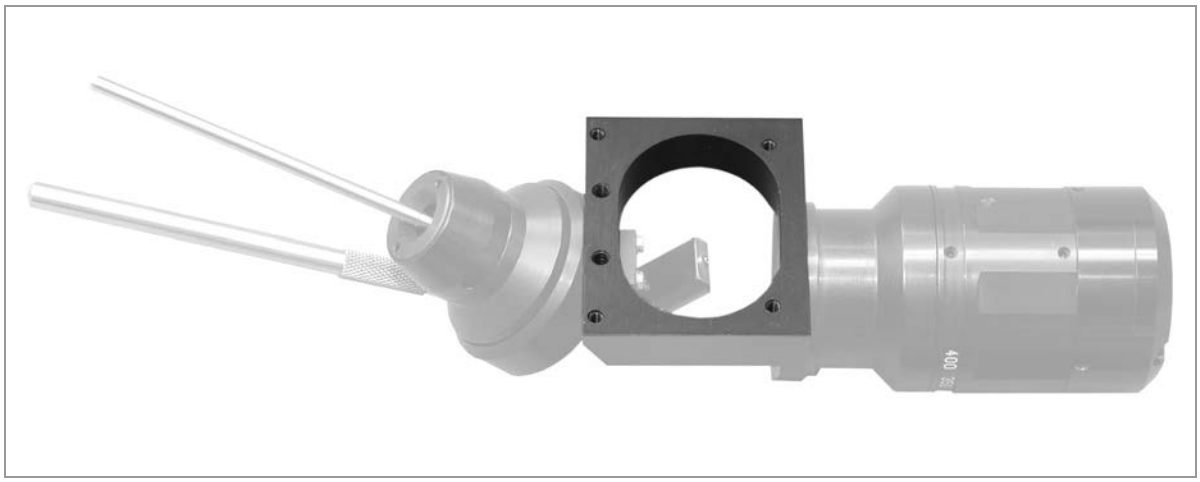

Fig. 5.1 Mounting surface with screw threads for various adapter plates

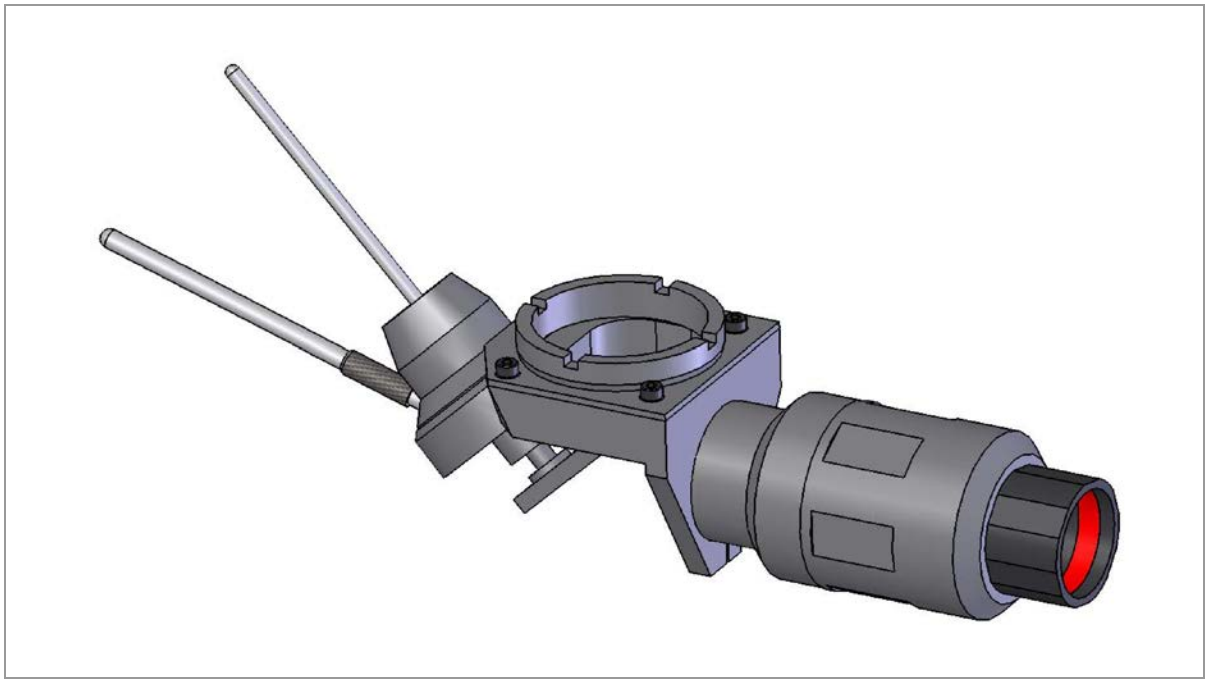

Fig. 5.2 Quick-coupling mounting option

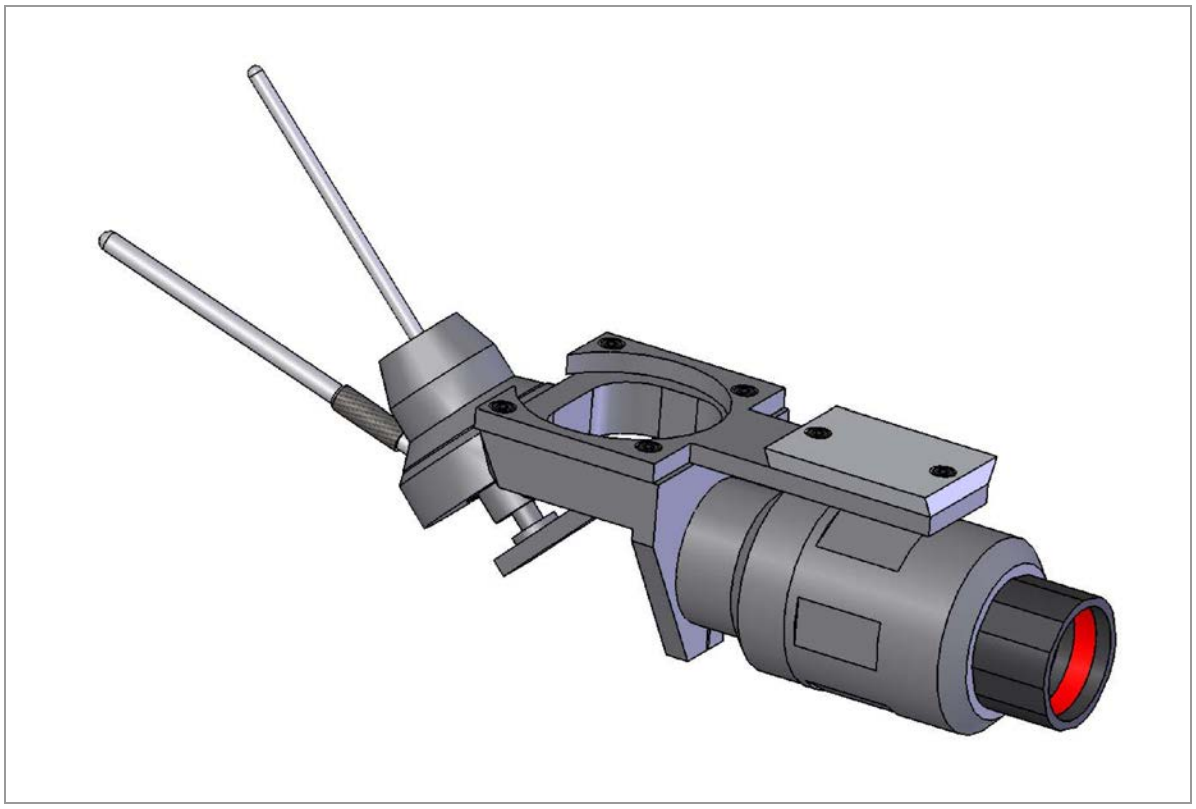

Fig. 5.3 Zeiss dovetail mounting option

Please note the following for Zeiss microscopes with a dovetail adapter:

NOTICE!

Before you mount the dovetail adapter, be sure to remove any adapter plates that may have been fitted (including plate 5 in Fig. 5.1)!

Slightly loosen the thumbscrew on the bottom of the microscope. Insert the MINI POINT by its dovetail adapter track into the open dovetail mount. Slightly tighten the clamping screw. Adjust the axial position of the MINI POINT so that the monitoring beam path of the microscope/colposcope is not obstructed. Tighten the clamp.

Make sure that the microscope can be pushed easily and smoothly onto the dovetail and does not catch anywhere.

ATTENTION!

Make sure that the monitoring beam path and the illumination beam path of the microscope/colposcope are not obstructed by the opening of the MINI POINT!

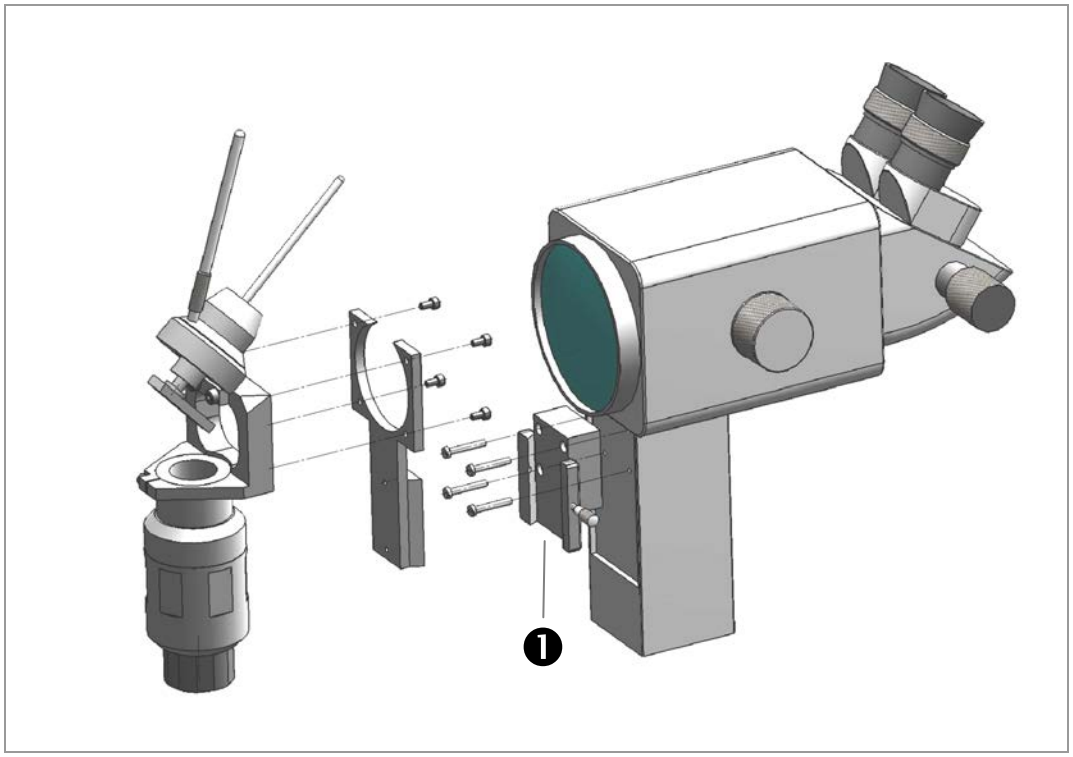

Fig. 5.4 Exploded view of the 150 FC colposcope with the MINI POINT

Item 1 Adapter plate with fastening screws, item number 76-400-18

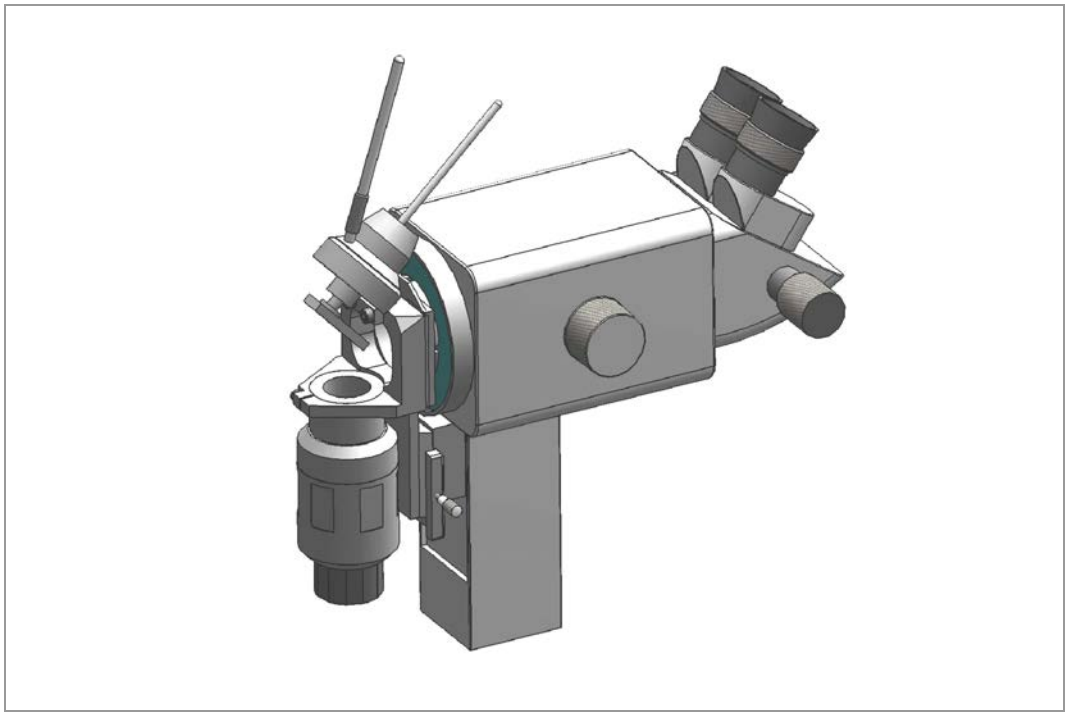

Fig. 5.5 View of the 150 FC colposcope with the MINI POINT attached

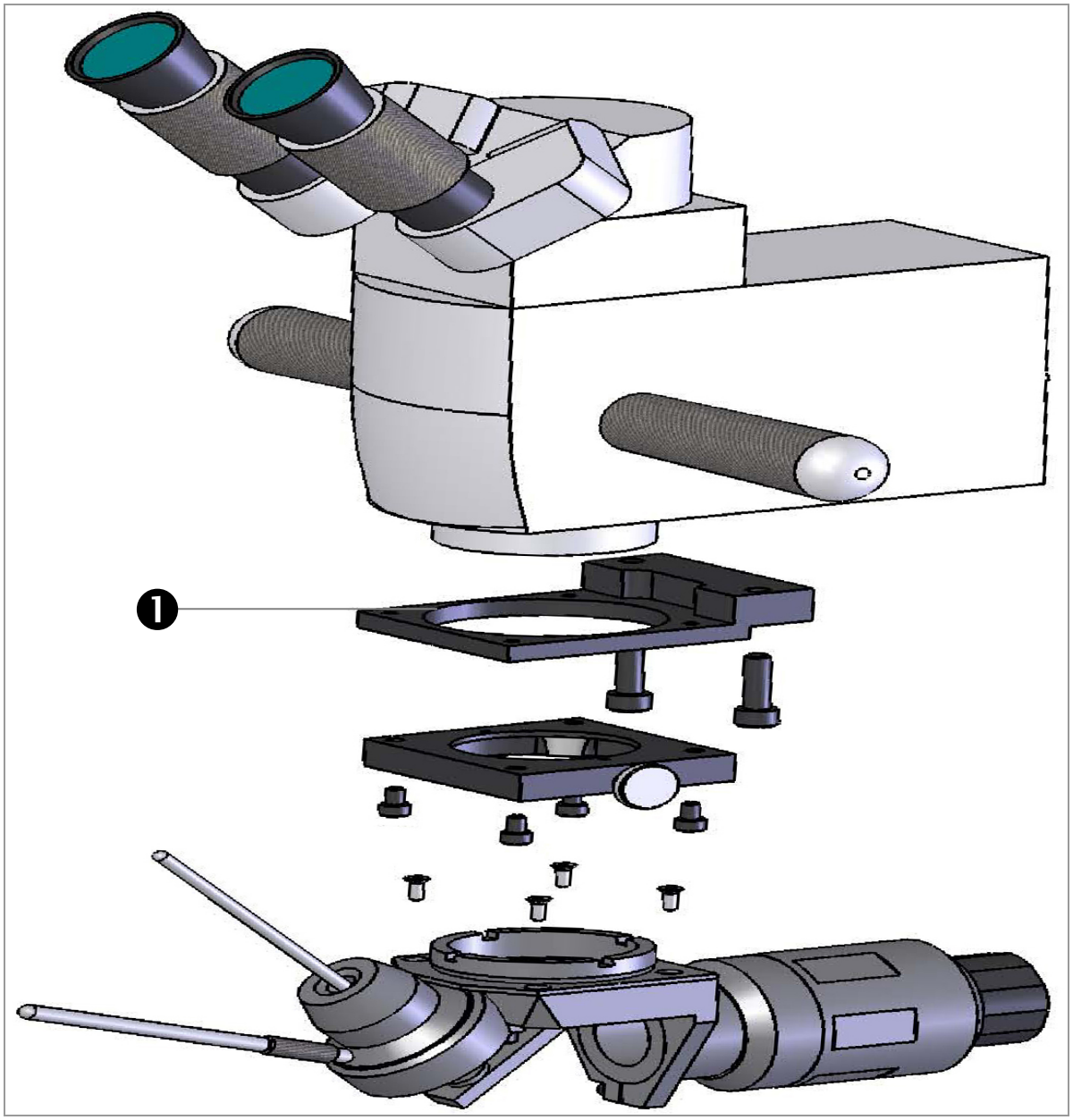

Fig. 5.6 Exploded view of the Leica-Wild M690 operating microscope with the MINI POINT

Adapter plate (1) with fastening screws, item number 76-400-13 (see Adapter Overview on page 11)

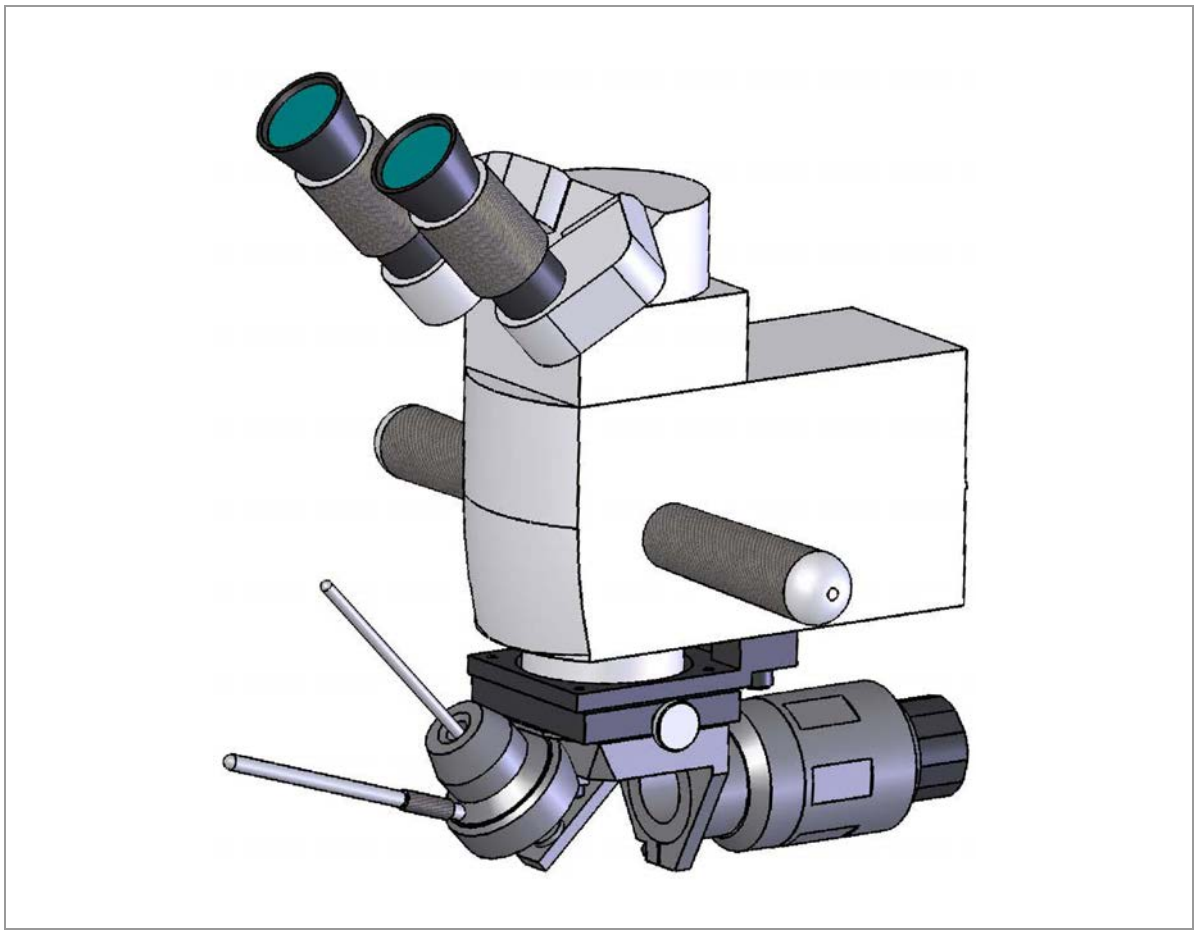

Fig. 5.7 View of the Leica-Wild M690 operating microscope with the MINI POINT attached

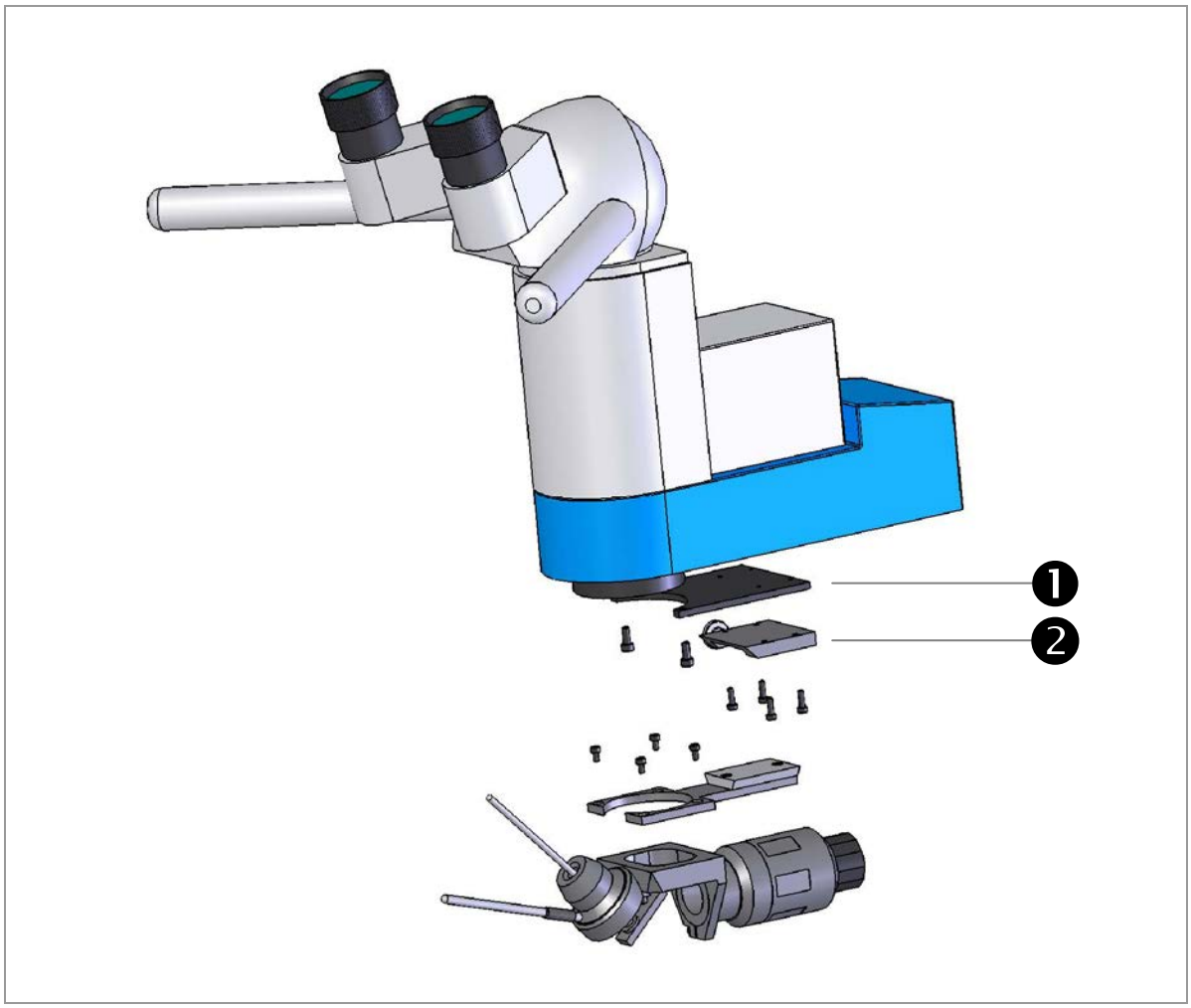

Fig. 5.8 Exploded view of the Moeller-Wedel operating microscope with the MINI POINT

Adapter plate (1) with fastening screws, item number 76-400-14, for installing the dovetail adapter track (2), item number 08-501-00-11.

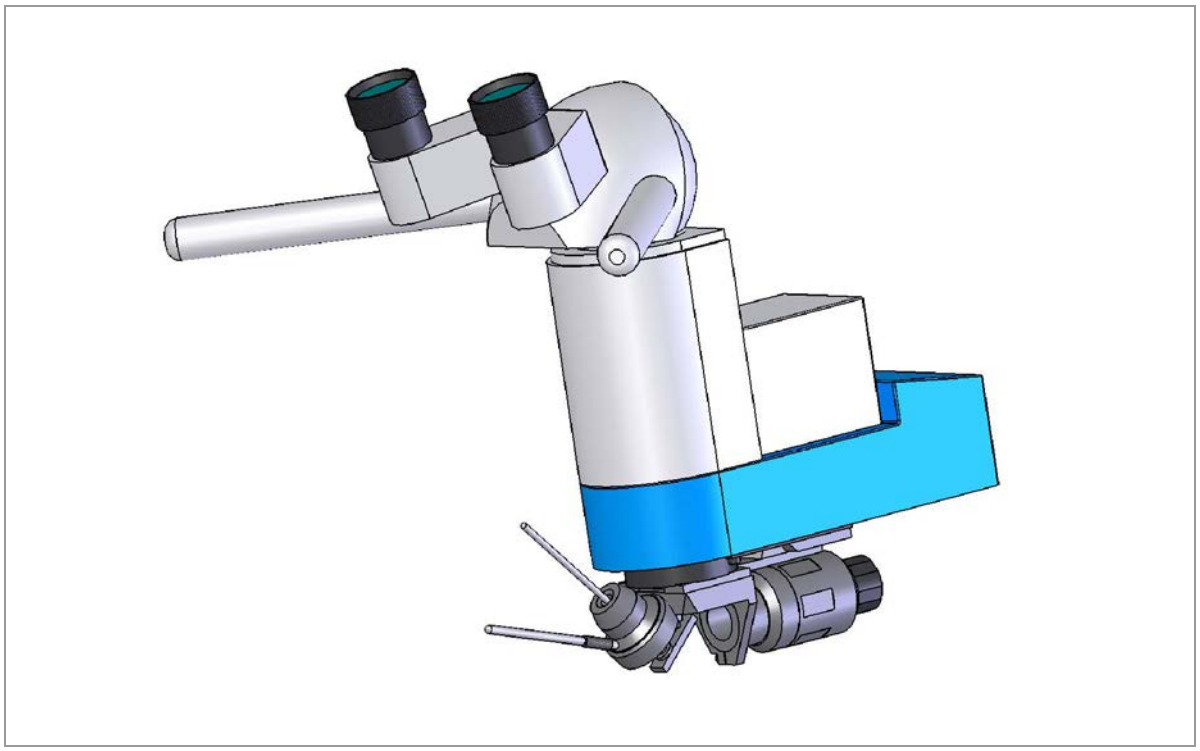

Fig. 5.9 View of the Moeller-Wedel operating microscope with the MINI POINT attached

NOTICE!

For adapter details, including the Soft Scan Plus adapter, refer to Section 4.3 “Accessories”, page 10.

5.3 Attaching the Articulated Mirror Arm to the MINI POINT

The articulated mirror arm must be attached to the MINI POINT.

When Soft Scan Plus scanners are used, the matching red adapter must first be screwed onto the articulated arm. For details, refer to Section 4.3.1 "Soft Scan Plus Adapter".

ATTENTION!

Make sure that the laser arm is correctly seated on the MINI POINT!

Faulty assembly could result in injury or poor work results!

6 Using the MINI POINT

6.1 Operation

ATTENTION!

Before you use the micromanipulator, make sure once again that the microscope/colposcope and the laser arm are correctly attached to the MINI POINT!

Secure the hand rest in the best ergonomic position for a right-handed or left-handed user as required.

Make sure that when the joystick for controlling the laser beam is in the working position, it can be operated comfortably with the hand normally held. This is important for relaxed and reliable operation.

6.2 Setting the Focal Length

Before treatment can begin, you must adjust the MINI POINT zoom lens to the focal length of the microscope. The focal length scale on the MINI POINT lens system corresponds to the focal length scale on the microscope.

The following example describes how to make the settings for a microscope with a focal length of 200 mm.

Proceed as follows (example):

- The attached microscope has a focal length of 200 mm.
- Select 200 mm as the setting on the MINI POINT zoom lens (the two values must always be identical).
- Set the microscope ocular preferably to ±0.
- Place a test object (ideally a wooden tongue depressor) a distance of 200 mm away.
- Adjust the distance between the wooden tongue depressor and the microscope until the depressor is in sharp focus in the microscope.
- Activate the laser once with a single pulse at 10 W for 0.1 s.
- Make slight adjustments in both directions to the focal length of the MINI POINT lens system in order to determine the smallest spot size (burn spot).
- When you have completed the fine setting, the burn spot on the test object should display the smallest scatter. It is quite possible that the red aiming beam will not be at its smallest in the setting "Smallest CO_2 spot size".
- This is the best focus setting and should no longer be changed.

NOTICE!

If, after you have made the settings, the object is sharply focused in the microscope, then the focal length is correctly adjusted!

After the MINI POINT focal length has been set, the laser beam will be optimally focused on the tissue. The zoom lens setting now corresponds to the focal length of the monitoring microscope or colposcope. This setting should no longer be changed!

If you are using a modern operating microscope with variofocus technology (focusing through change of focal length), then the variofocus feature must be deactivated.

Once the settings are completed, you must carry out a new test on a test object (paper or a wooden tongue depressor).

Put a sheet of paper or a wooden tongue depressor onto a laser-proof support (table or plate) and place it into the surgical field. The tongue depressor must now be sharply visible through the operating microscope. Activate the laser, then check the sharpness of the burn spot produced on the wooden surface. The burn spot should be small and round. If this is not the case, adjust the MINI POINT focal length once again until a clean, small burn spot is produced.

6.3 Joystick Operation

The beam is controlled comfortably and easily with the joystick. Rest your hand comfortably on the personally adjusted hand rest and grasp the joystick between your index finger and thumb.

The joystick is connected to the deviating mirror by means of a precision reduction gear. As you manipulate the joystick, the position of the two laser beams on the tissue changes. The deviating mirror, controlled by the joystick, affects the red aiming beam as well as the infrared CO_2 laser beam.

The beams follow the movement of the joystick. If the joystick is moved up, then the laser beams also move upwards. If the joystick is moved to the right, then the spot moves likewise to the right.

7 Technical Data

Designation	Micromanipulator
Type	MINI POINT
Item number	76-400-00
MDD classification	IIa
Marking	CE 0297
Laser wavelength	10600 nm
Laser power	0–50 W
Aiming beam wavelength	630 ± 30 nm
Lens system	Multiple-lens zoom system
Optical focal length	200–400 mm, infinitely adjustable Latching at 200, 250, 300, 350 and 400 mm
Spot diameter	0.36 mm with 200 mm focal length 0.76 mm with 400 mm focal length
Weight	580 g
Length without joystick	195 mm
Length with joystick	272 mm
Width	60 mm
Height without joystick	60 mm
Length of hand rest	95 mm, position of hand rest adjustable
Length of joystick	72 mm
Working field	approx. 30 x 30 mm with 200 mm focal length approx. 60 x 60 mm with 400 mm focal length

ATTENTION!

A safety check must be carried out once a year in conjunction with the safety check of the laser unit!

8 Maintenance and Warranty

8.1 Maintenance

Your MINI POINT micromanipulator is a precision instrument and must be treated with due care.

The primary maintenance requirement is for proper cleaning of the mirror. In normal use the mirror is exposed to intensive laser light. Any surface contaminants will absorb energy and create “hot spots” that could destroy the mirror coating. If the coating is damaged, laser performance will be reduced and the quality of the mirrored beam will be adversely affected. Therefore, it is especially important to keep the mirror clean.

The MINI POINT micromanipulator can either be left mounted on the microscope, or be removed and stored in its original packing case to await a subsequent procedure.

ATTENTION!

No maintenance other than that listed below may be carried out on the MINI POINT micromanipulator!

If you have any questions, please contact Gebrüder Martin or its authorized service partner.

- Only Gebrüder Martin or its authorized service partner may clean the zoom lenses if they become dirty. There is a danger of laser light scatter if the specially coated lens surfaces become damaged or scratched!
- Check the mirror regularly, but clean it only if it is dirty. Use lens-cleaning tissue: Fold the tissue to form a lip and wipe over the mirror surface in one direction.
  Before wiping, apply one drop of cleaning agent to the mirror surface (use either acetone-ether solution in a ratio of 2:1 or petroleum spirit or methanol). Do not rub with circular movements.
- Wipe the housing surfaces with a clean cloth.
- Inspect the exterior of the MINI POINT micromanipulator each time before you use the unit. Pay special attention to the mirror and the lens system.
- Check the sharpness of the aiming beam. It must be possible to focus the aiming beam sharply on a sheet of paper.

ATTENTION!

Do not sterilize your MINI POINT micromanipulator!

8.2 Repairs

The MINI POINT micromanipulator is factory-repairable only. Report any damage or malfunction to Gebrüder Martin's authorized service partner or contact us direct.

Gebrüder Martin or its authorized service partner will explain how to return the unit and obtain a replacement.

8.3 Spare Parts

Components and standard accessories can be obtained from your authorized service partner or direct from Gebrüder Martin. Refer to Section 4 "Components" and Section 4.3 "Accessories".

8.4 Product Liability and Warranty

Gebrüder Martin will assume responsibility for the safety, reliability and proper functioning of this unit only if:

readjustments, modifications or repairs are carried out by authorized persons;

the unit is used in accordance with these Operating Instructions.

Any unauthorized repair or modification invalidates the warranty!

NOTICE!

A two-year period of warranty shall apply.

Damage or malfunctions due to operator misuse or improper handling are excluded from the warranty.

It is essential, therefore, to read these Operating Instructions before using the unit and to observe them at all times!

9 List of Figures

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