MICRO POINT 2 / MICRO POINT 2 R

Instructions for Use

CE 0297

EN

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KLS martin GROUP

Table of Contents

1 Introduction

1.1 General Information

Welcome to your KLS Martin MICRO POINT 2 / 2 R micromanipulator.

The MICRO POINT 2 / 2 R micromanipulator allows you to use your CO_2 laser for surgical applications in conjunction with an operating microscope. You can connect the MICRO POINT 2 / 2 R to a large range of operating microscopes, enabling you to make highly precise use of the laser beam via mechanical and/or electronic beam control.

This manual provides in-depth information about the functionality, installation and operation of the MICRO POINT 2 / 2 R micromanipulator and how it can be used for the best possible results. Detailed maintenance and cleaning instructions guarantee in addition that your MICRO POINT 2 / 2 R will work reliably and smoothly.

Notice! Should you have any questions regarding the operation or maintenance of your MICRO POINT 2 / 2 R, please contact Gebrüder Martin GmbH & Co. KG or an authorized service partner.

1.2 CO_2 Laser Light Delivery

The MICRO POINT 2 / 2 R enables laser light to be transmitted via mirrors. The mirrors used are combined into a folded optical system offering a high focal length for superior focusing of the laser beam.

The MICRO POINT 2 / 2 R focuses the pilot laser beam (aiming beam) in exactly the same way as the CO_2 working beam.

As the focal plane is identical for both laser beams, the pilot beam allows precise adjustment of the working beam.

A red pilot laser indicating the working or application spot is a standard feature of the following KLS Martin CO_2 laser units: MCO25, MCO50, MCO25plus and MCO50plus.

1.3 MICRO POINT 2 / 2 R Operating Advantages

With the MICRO POINT 2 / 2 R it is easy to bring together the monitoring beam path and the paths of the CO_2 laser beam and the pilot laser beam (Fig. 1-1). The focal/working distance can be easily adjusted with the zoom ring.

Thanks to its great flexibility, the MICRO POINT 2 / 2 R can be adapted for use with numerous OR microscopes.
Combined with a KLS Martin CO_2 laser, the MICRO POINT 2 / 2 R 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 MICRO POINT 2 / 2 R produces very small spot sizes across the entire focal length range from 225 mm to 500 mm.

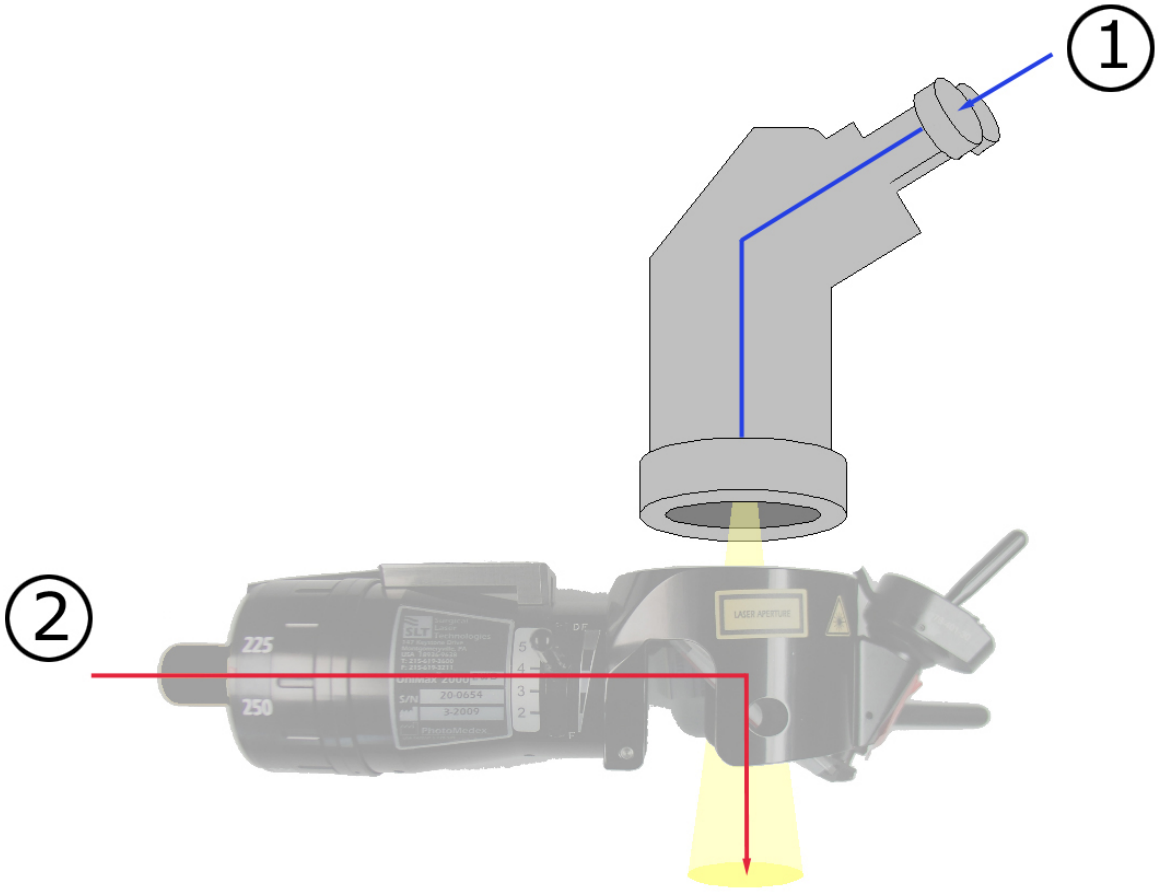


Fig. 1-1 MICRO POINT 2 / 2 R beam path

1 Microscope/monitoring beam path *2 Laser light beam path*

2 Intended Use

The MICRO POINT 2 / 2 R micromanipulators are intended for focusing and controlling CO_2 laser light during microsurgical interventions.

They are to be used for laser operations in conjunction with operating microscopes.

The laser wavelength to be used is 10,600 nm and the maximum output power is 50 watts in continuous mode (CW).

The MICRO POINT 2 / 2 R micromanipulators are compatible with KLS Martin CO_2 lasers. The KLS Martin products are matched to each other in terms of performance 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 GmbH & Co. KG.

WARNING! Gebrüder Martin GmbH & Co. KG accepts no liability for any material damage or injury to health caused by non-intended use!

3 Product Liability & Warranty

3.1 General Information

We thank you for having decided in favor of a KLS Martin product. This product carries the CE-mark, which means that it satisfies the essential requirements laid down in the EC Directive concerning medical devices.

We are the manufacturer of this product:

Gebrüder Martin GmbH & Co. KG

A company of the KLS Martin Group
KLS Martin Platz 1 ● D-78532 Tuttlingen / Germany
Postfach 60 ● D-78501 Tuttlingen / Germany
Tel.: +49 7461 706-0 ● Fax: +49 7461 706-193
info@klsmartin.com ● www.klsmartin.com

3.2 Warranty

General Information

Our Standard Terms and Conditions of Sale as updated from time to time shall apply. Agreements diverging from these Standard Terms and Conditions do not restrict the legal rights of the buyer.

Any warranty exceeding the above provisions shall require a contractual form and shall exclude component-related vandalism, software updates and consumables.

Improper interventions or alterations performed by third parties during the period of limitation shall void any and all warranty claims. Unauthorized actions performed on the product shall invalidate any liability claims against Gebrüder Martin.

Important Notices

The product may only be repaired by Gebrüder Martin or a qualified person or firm expressly authorized by Gebrüder Martin to perform such work.

If the repair is carried out by a person or firm specially authorized by Gebrüder Martin, the operator of the product is required to obtain from the repairer a certificate with details about the nature and scope of the repair work done. This certificate must be dated and signed and include the firm’s details.

In all cases where a party other than the product manufacturer performed the work, repaired products must be additionally marked with the repairer’s ID label.

Improper interventions or alterations performed by third parties during the period of limitation shall void any and all warranty claims. Unauthorized actions performed on the product shall invalidate any liability claims against Gebrüder Martin.

3.3 User's Inspection

Immediately upon receipt, check the goods for completeness and integrity. Any damage or loss in transit must be reported without delay.

3.4 Hotline

- Should you have any questions concerning the proper handling of the unit/product or clinical applications, please contact our
  Product Management:
  Tel.: +49 7461 706-243
  Fax: +49 7461 706-190
- Should you have any technical questions, please contact our
  Martin Service Center:
  Tel.: +49 7461 706-343
  Fax: +49 7461 706-203
  E-mail: msc@klsmartin.com

Our hotline is available Monday through Friday from 8 a.m. to 5 p.m. (CET).

Should you have any questions concerning maintenance contracts or training courses, please contact our Technical Service Manager under +49 7461 706-332, or send an e-mail to: msc@klsmartin.com.

4 Safety

4.1 Warnings and Precautions

The MICRO POINT 2 / 2 R micromanipulator is intended for use by physicians and specialized medical staff trained in handling surgical lasers.

Use of the MICRO POINT 2 / 2 R micromanipulator requires familiarity of the operator with the safety and operating instructions relating to the laser system used.

Be sure to observe the safety provisions relating to the laser used!

WARNING! 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 MICRO POINT 2 / 2 R micromanipulator in your CO_2 laser logbook.

The MICRO POINT 2 / 2 R micromanipulator must be inspected annually as part of the recurrent safety check to be carried out on your laser.

WARNING! To assure reliable and smooth operation, be sure to observe the maintenance instructions provided in section 8!

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 MICRO POINT 2 / 2 R.

4.2 Laser Safety

With the laser units prescribed for use with the MICRO POINT 2 / 2 R, all of which are Class 4 lasers, both the direct laser beam and the laser light reflected diffusely from surfaces can be dangerous.

The unit emits radiation in the non-visible spectral range of 10,600 nm. Be aware that such radiation can cause irreversible damage to the eyes, skin and other organs.

All doors providing access to the laser area must be marked by warning lamps. The "laser area" is defined as the area in which the maximum permissible exposure (MPE) values that are normally binding may be exceeded, taking the possibility of an accidental deflection of the laser beam into consideration as well. Therefore, the following safety provisions must be complied with under any circumstances:

- All persons present in the laser area during laser operation must be informed about all the dangers posed by laser light and must wear suitable protective goggles. The patient's eyes need to be protected as well.
- It is the responsibility of the operator of the unit to provide suitable protective equipment.
- The organ most endangered by the laser light is the human eye. Therefore, when the laser is switched from **STANDBY** to **LASER READY**, all persons present in the laser area must wear protective goggles rated "D 10,600 nm L4" or higher, as prescribed by DIN EN 207 for CO_2 lasers.

Notice!

When using MCO25, MCO50, MCO25plus or MCO50plus laser units, protective goggles rated "D 10600 nm L4"* must be used, as prescribed by DIN EN 207.
Never stare directly into the red pilot laser beam! Be aware that the afore-mentioned protective goggles do not protect against the red pilot laser light!

* See Operating Instructions relating to your laser unit

- When performing open surgery, the entire operating room is considered as the laser area.
- Never keep potentially explosive substances in the laser area! Easily flammable materials might catch fire!
- If laser radiation is applied in the area of organs, body cavities or tubi that may contain flammable gases or vapors, protective measures must be taken against potential fire and explosion hazards.
- Objects that are capable of reflecting CO_2 laser light must either be covered or removed from the laser area. Windows and reflecting walls must also be covered with suitable materials. Besides, adequate protective measures must be taken also if harmful gases, dust, smoke or secondary radiation could be generated, or if potentially explosive gas mixtures could be formed, as a result of the impact of laser radiation on certain substances or materials.
- Instruments that need to be brought into the beam path in the course of the medical treatment must have such a shape and finish that dangerous reflections are largely prevented.
- The laser area should be kept as small as possible and should be screened off, making sure that it cannot be entered by unauthorized persons. The number of people present in the laser area should always be kept to the essential minimum.

- At least once a year, all persons working in the laser area must be informed on pertinent safety requirements and measures to be taken, and must be instructed in the proper handling of the laser unit. Such instruction must be recorded in writing, together with a list of all participants.
- Laser light can be an ignition source. Never activate the CO_2 laser in the vicinity of flammable materials, liquids or gases – especially anesthetics. Non-observance poses a fire or explosion hazard!

4.3 Compliance with Safety Regulations

The MICRO POINT 2 / 2 R is CE-marked and therefore complies with the EU Medical Devices Directive (MDD).

If you need additional information on your MICRO POINT 2 / 2 R or wish to contact the Technical Service of Gebrüder Martin GmbH & Co. KG, please always indicate the item number and serial number of your MICRO POINT 2 / 2 R and the type of laser used.

4.4 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 spot diameter greatly affects the laser's impact on the tissue. The highest power densities are obtained with the shortest focal length of 225 mm. The various power densities and corresponding spot sizes are detailed in section 7.3.

It is customary to use a microscope with a fixed focal length. In this case the working distance remains the same and the MICRO POINT 2 / 2 R is operated with a fixed focal length as well. The spot diameter is also kept constant as a result.

4.5 Marking

The MICRO POINT 2 / 2 R is fitted with a warning label as shown in Fig. 4-1. Never stare into the laser aperture (beam exit opening) when the laser unit is energized!

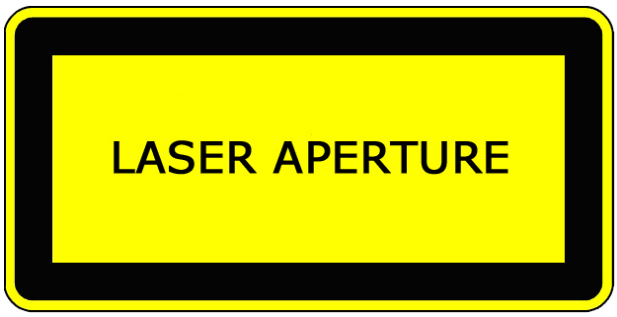


Fig. 4-1 Laser aperture – Warning notice

5 Components

5.1 Scope of Supply

Your MICRO POINT 2 / 2 R is delivered with the following parts (shown in Fig. 5-1):

- MICRO POINT 2 / 2 R (1, Fig. 5-1).
- Joystick nut (only MICRO POINT 2 / 2 R) (2, Fig. 5-1).
- Beam alignment indicator (3, Fig. 5-1) for checking correct laser beam adjustment with the pilot laser beam.
- Soft Scan Plus adapter (4, Fig. 5-1) for connecting the Soft Scan Plus scanner to your micromanipulator.
- Allen socket wrench (6, Fig. 5-1) for mounting and adjusting the microswitch (only MICRO POINT 2 / 2 R).
- Allen wrench set (7, Fig. 5-1).
- Adapter plate (8, Fig. 5-1) for easy mounting of the MICRO POINT 2 / 2 R on the operating microscope.

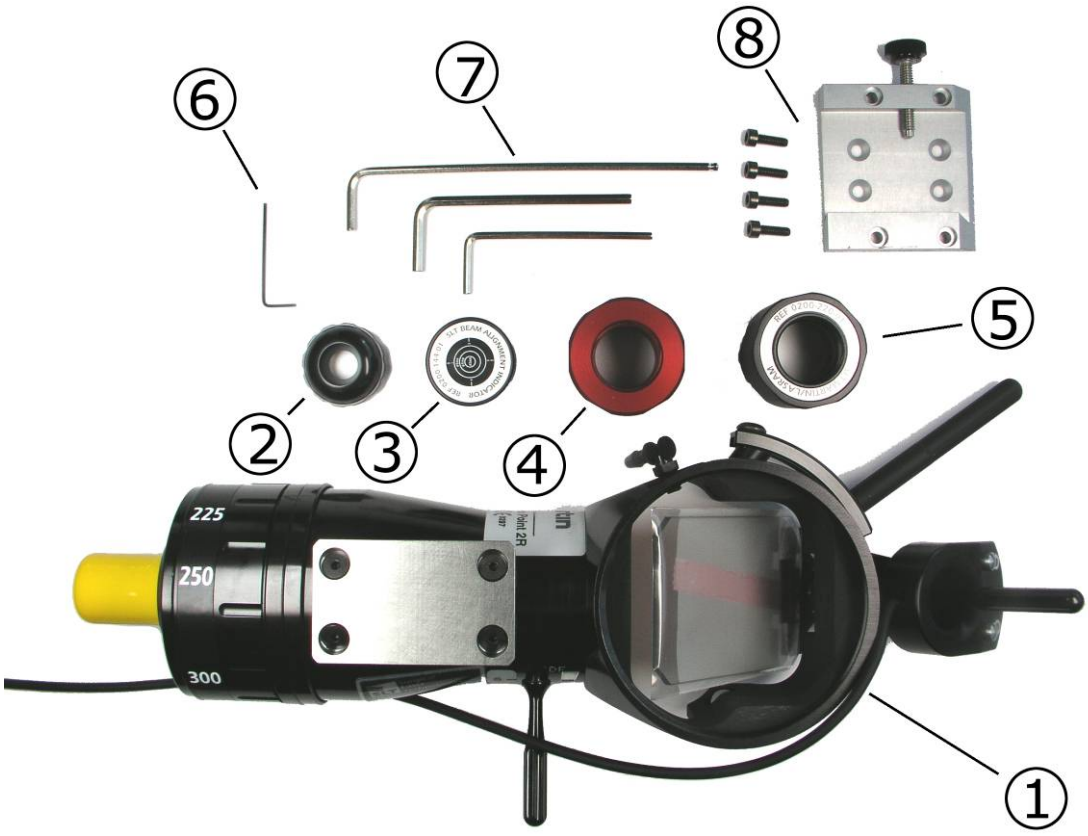


Fig. 5-1 MICRO POINT 2 / 2 R scope of supply

1 MICRO POINT 2 / 2 R
2 Joystick nut (MICRO POINT 2 / 2 R only)
3 Beam alignment indicator
4 Soft Scan Plus adapter
5 Laser arm adapter
6 Allen wrench (MICRO POINT 2 / 2 R only)
7 Allen wrench set
8 Adapter plate (Zeiss)

5.2 Design of the MICRO POINT 2 / 2 R

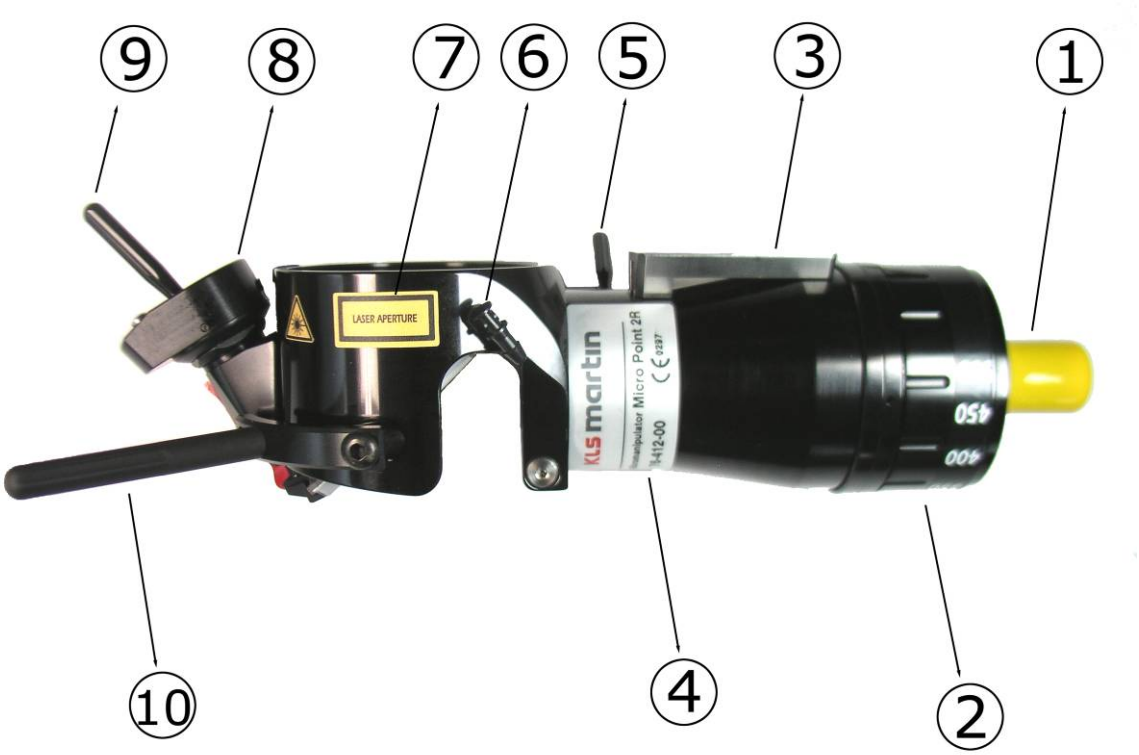


Fig. 5-2 MICRO POINT 2 / 2 R design

1 Protective cap
2 Focal length setting (zoom) ring
3 Dovetail mounting plate
4 Rating plate with serial number
5 Focus/defocus selector, with lever
6 Irrigation gas connector
7 ***LASER APERTURE*** *warning label*
8 Microswitch (MICRO POINT 2 R only)
9 Joystick
10 Hand rest

5.3 Soft Scan Plus Adapter

A red adapter is available for connecting the Soft Scan Plus or Soft Scan Plus R scanner of the MCO25plus or MCO50plus laser to the MICRO POINT 2 / 2 R micromanipulator so that you can scan via the latter. The adapter (4, Fig. 5-1) is fitted between the red output of the Soft Scan Plus / Plus R and the micromanipulator.

5.4 Microswitch for Line Scan

If you work with a MCO25/50plus laser with software 5.00 and a Soft Scan Plus R scanner, the microswitch allows you both to rotate the scan pattern and to adjust the curvature (bending radius) of the line pattern when using the Line Scan function.
The scanning pattern can be rotated clockwise (2, Fig. 5-3) as well as counterclockwise (4, Fig. 5-3). The line curvature can be adjusted with the central switch (3, Fig. 5-3).

Fig. 5-3 Microswitch (MICRO POINT 2 R only)

1 Microswitch
2 Switch for clockwise rotation of the scan pattern
3 Switch for curving the scan figure (line)
4 Switch for counterclockwise rotation of the scan pattern

6 Preparing your MICRO POINT 2 / 2 R for Use

To identify the components and accessories of the MICRO POINT 2 / 2 R, refer to section 5.

WARNING! Prior to each use, be sure to inspect the housing of the MICRO POINT 2 / 2 R for potential damage and foreign bodies. If damage is found, please contact Gebrüder Martin's authorized service partner!
To clean the housing and zoom lens, refer to section 8.2.

6.1 Arm Rest

The lateral position of the arm rest can be adjusted. To release the clamping mechanism, rotate the Allen wrench counterclockwise by one and a half rotations, then select the new position and rotate wrench clockwise to fix handle in place again. It is also possible to transfer the arm rest from the right side (for right-handers) to the left side (for left-handers). To this end, loosen the outer fixing screw with the wrench (2, Fig. 6-1) and remove the arm rest (1, Fig. 6-1). Remove the inner fixing bolt with the wrench (3, Fig. 6-1) and screw bolt in place on the left side, then attach the arm rest.

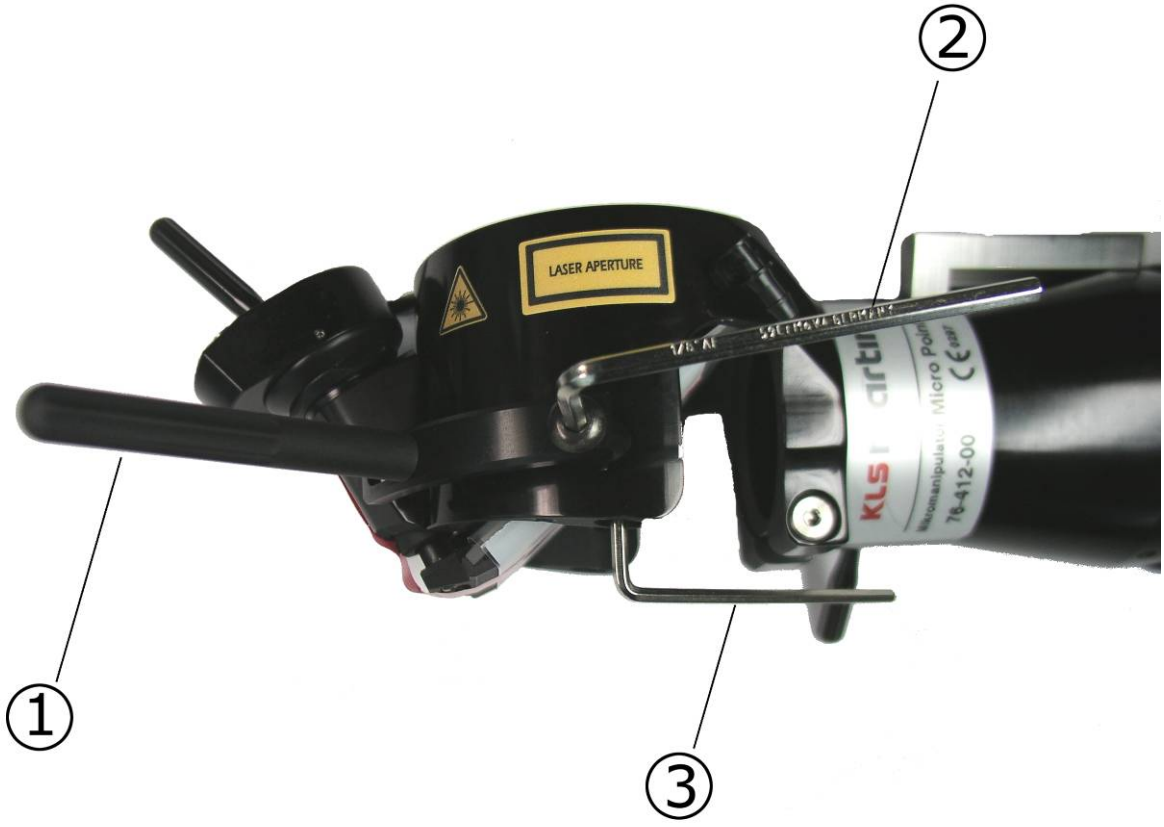


Fig. 6-1 Arm rest

1 Arm rest (can be mounted on either side)
2 Hexagonal socket (Allen) wrench 1/8"
3 Hexagonal socket (Allen) wrench 3/32"

6.2 Completing the Assembly

To complete the assembly, proceed as follows:

- Select the appropriate adapter according to the type and design of your microscope. See section 6.3.
- When using the "Soft Scan Plus" scanner, the scanner must be connected together with the MICRO POINT 2 / 2 R.
- When using a gas irrigation system, this unit must be connected to the gas connector of the MICRO POINT 2 / 2 R via a flexible gas tube.
- When using a sterile disposable drape for the microscope, the drape must be fitted to the MICRO POINT 2 / 2 R using the drape adapter. See section 7.6.

6.3 Attaching the MICRO POINT 2 / 2 R to the Microscope

Once the appropriate adapter has been selected and fitted to the microscope, the two devices can be connected with each other. For Zeiss microscopes, the adapter plate is already included in the scope of supply as a standard component. For the following OR microscope makes, adapters are available from Gebrüder Martin on request:

Kaps
Leica
Möller-Wedel
Olympus
Zeiss

The exact procedure for fitting the MICRO POINT 2 / 2 R to the various operating microscopes, please refer to the diagrams provided in the Annex (section 12).

6.4 Checking the Laser

WARNING! Never use the CO_2 laser beam for checking the CO_2 laser for proper adjustment! Only the red pilot light may be used for this purpose!

A well-adjusted CO_2 laser is required for working with the MICRO POINT 2 / 2 R. This can be verified with the beam alignment indicator:

1. Make sure that the laser system has been set to STANDBY mode.
2. Switch off scanner by selecting the single-pulse operating mode.
3. Screw the beam alignment indicator into the adapter instead of the micromanipulator.
4. Turn on the pilot laser.
5. Check the size and position of the red pilot light on the indicator surface (Fig. 6-2).

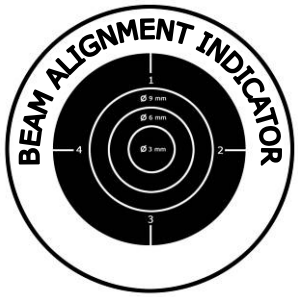


Fig. 6-2 Beam alignment indicator

When using an MCO 25/50plus laser with ENT module, the red pilot laser beam should have a diameter of approx. 3 mm and should be located in the center. A good result will still be guaranteed if the beam spot is no more than 3 mm off-center.

When using an MCO 25/50plus laser with standard module, the red pilot laser beam should have a diameter of 3 mm. The beam spot may be located up to 3 mm off-center.

The diameter of the pilot beam spot can vary a little, depending on the brightness and version of your pilot laser. The red spot should always be located in the center, with the maximum off-center tolerance limited to 3 mm.

If deviations are greater, please contact the Technical Service to have your MCO laser checked.

6.5 Attaching the Articulated Mirror Arm to the MICRO POINT 2 / 2 R

If no scanner is used, the articulated mirror arm of the laser unit must be directly connected to the MICRO POINT 2 / 2 R using the black adapter (5, Fig. 5-1). Screw the adapter first in place on the laser arm and then on the MICRO POINT 2 / 2 R.

When using a Soft Scan Plus scanner in addition, the red adapter (4, Fig. 5-1) must be used to connect the scanner to the micromanipulator (see section 5.3). The articulated mirror arm is connected to the red input of the scanner in this setup (no adapter needed).

CAUTION! It is essential to ensure that the laser arm is attached correctly to the MICRO POINT 2 / 2 R!
Note that non-compliance poses a risk of injury and affects your working results!

7 Using the MICRO POINT 2 / 2 R

7.1 Operation

CAUTION! Before you use the micromanipulator, verify once again that the microscope and the laser arm are correctly attached to the MICRO POINT 2 / 2 R!

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

When starting the application, the joystick should be in neutral position, i.e. perpendicular to the microswitch or clamping ring.

7.2 Setting the Focal Length

Before treatment can begin, you must adjust the MICRO POINT 2 / 2 R zoom lens to the focal length of the microscope. The focal length scale on the MICRO POINT 2 / 2 R lens system corresponds to the focal length scale on the microscope.

The following example describes how to make the settings when using a microscope with a focal length of 250 mm.

Proceed as follows **(EXAMPLE)**:

- The attached microscope has a focal length of 250 mm.
- Select 250 mm as the setting on the MICRO POINT 2 / 2 R zoom lens as well.
- Set the focus/defocus selector of the MICRO POINT 2 / 2 R to position “F” (focused).
- Set the microscope ocular preferably to ±0.
- Place a test object – preferably a wooden tongue depressor – under the microscope.

- Adjust the distance between the test object and the microscope until the test object is seen in sharp focus through the ocular.
- Activate the laser once with a single pulse at 10 W for 0.1 s.
- Using the zoom ring, make slight adjustments to the focal length of the MICRO POINT 2 / 2 R in both directions in order to determine the smallest focal spot size (burn spot).
- When you have completed the fine setting, the burn spot on the test object should display the smallest diameter. The diameter of the pilot laser beam is also minimized in this setting.
- This is the focal length setting to work with.

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 focal length of the MICRO POINT 2 / 2 R 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. This setting should no longer be changed!
If you are using a modern operating microscope with variofocus technology (automatic focusing through change of focal length), then the variofocus feature must be deactivated.

Once the settings are completed, we recommend carrying out a repeat test using a test object (paper or a wooden tongue depressor) for verification.

7.3 Power Density

The impact of the laser light on the tissue depends on the focal power density. The lateral lever (focus/defocus selector) enables you to change over quickly and conveniently from the focused beam (F) to a defocused beam (DF), thus increasing the spot size and reducing power density.

Other parameters determining the effective power density are the focal length and the laser power. The following table shows the available settings and resulting power densities.

Focal length setting	**Minimum (focused)**			**Maximum (defocused)**		
	Spot size (mm)	**Power density (kW/cm^2) at:**		**Spot size (mm)**	**Power density (kW/cm^2) at:**	
		25 W	**50 W**		**25 W**	**50 W**
225 mm	0.105	289	577	1.8	98	196
250 mm	0.110	263	526	2.0	80	159
300 mm	0.120	221	442	2.2	66	132
350 mm	0.130	188	377	2.5	51	102
400 mm	0.140	162	325	2.7	44	87
450 mm	0.150	141	283	2.8	41	81
500 mm	0.160	124	249	3.0	35	71

7.4 Controlling the Laser Beam

The beam delivery system reflects the laser beam and the pilot (aiming) beam into the monitoring beam path of the operating microscope. The mirror used for coupling in the beams can be moved via the joystick. This is done by grasping the joystick with the thumb and the forefinger while placing the hand conveniently on the hand rest.

The joystick is connected to the deviating mirror via a precision reducing gear. This allows you to fine-adjust the mirror by tilting or inclining it as required, thus controlling the position (focal spot) of the two laser beams on the tissue. The joystick-controllable deviating mirror acts upon both the red pilot laser and the infrared CO_2 working beam.

Moving the joystick moves the beams in the same direction. So if you move the joystick upwards, the laser beams move upwards as well; if you move the joystick rightwards, the beam spot follows suit again. For example, you can use the joystick to move the laser beam across the tissue in a cutting motion.

Additional laser beam control is available when using a scanner (which is to be mounted between the micromanipulator and the laser arm). The scanner allows you to transfer scan patterns (geometrical figures or lines, selectable via the laser display) to the tissue. Again, the position of the scan pattern on the skin can be controlled with the joystick.

7.5 Microswitch Operation

When using a MICRO POINT 2 R unit, the microswitch enables you to rotate the scan pattern via the micromanipulator, which provides two buttons for this purpose (2 and 4, Fig. 5-3, for clockwise and counterclockwise rotation). The third, central button (3, Fig. 5-3) is intended for adjusting the curvature (bending radius) of your scanning line when using the Line Scan function.

Notice! The microswitch functions are active only after the laser has been switched to LASER READY!

7.6 Sterile Drape

When using the MICRO POINT 2 / 2 R for sterile procedures, the operating microscope including the micromanipulator is covered with a sterile drape. The drapes specifically intended for your operating microscope must be used for this purpose.

Notice! Before you attach the drape, the MICRO POINT 2 / 2 R, the scanner and the articulated mirror arm of the laser must be connected first and the focal settings made.

To attach the drape, the MICRO POINT 2 / 2 R must first be fitted with a drape adapter (Fig. 7-1). (For procedure, see Drape Adapter Mounting Instructions).

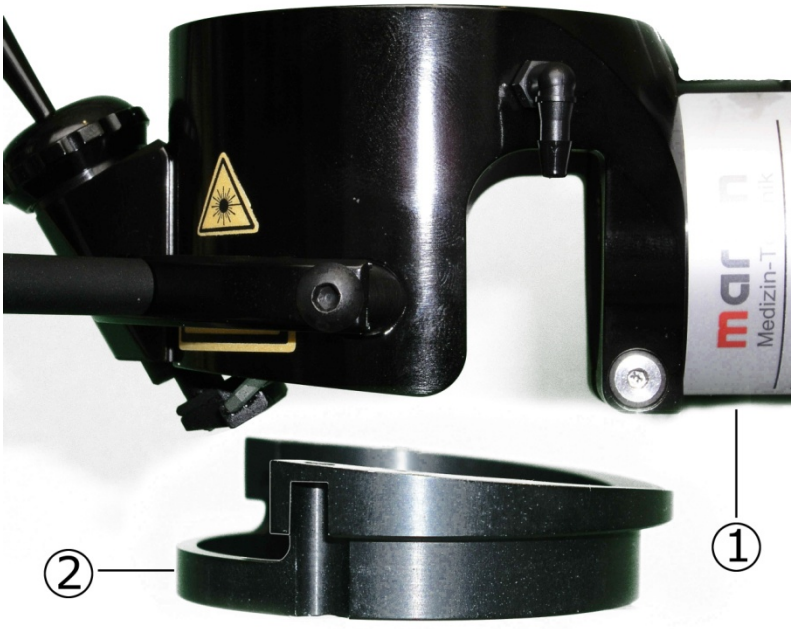


Fig. 7-1 Drape adapter

1 MICRO POINT 2 / 2 R *2 Drape adapter*

The plastic push-on ring of the drape opening (intended for the objective) is now plugged in place on the pre-mounted drape adapter. The drape is then pulled over the operating microscope to cover also the MICRO POINT 2 / 2 R and the articulated mirror arm of the laser.

8 Maintenance

WARNING! No maintenance other than that listed below may be carried out on the MICRO POINT 2 / 2 R micromanipulator!

Never soak, boil, autoclave or sterilize your MICRO POINT 2 / 2 R! Non-compliance will damage the optical components irreversibly!

Never immerse the unit in disinfectant solution! Never spray the unit for cleaning or disinfection!

If you have any queries, please contact Gebrüder Martin GmbH & Co. KG or an authorized service partner!

8.1 Maintenance

The MICRO POINT 2 / 2 R micromanipulator is an optical instrument and as such to be treated with care.

Check your MICRO POINT 2 / 2 R for easy movement of the laser arm adapter and the zoom ring. Moreover, check the joystick for proper functioning and zero "play" and the mirror for cleanness.

You can either leave your MICRO POINT 2 / 2 R micromanipulator mounted on the microscope or detach it and store it in its original packaging until it is needed for an intervention again.

8.2 Cleaning

- Only Gebrüder Martin or an authorized service partner may clean the mirrors of the zoom lens system if they become dirty. There is a danger of laser light scatter if the specially coated mirror surfaces become damaged or scratched.
- Check the deviating mirror regularly, but clean it only if dirty. Use lens-cleaning tissue: Fold the tissue to form a lip and drag-wipe over the mirror surface in one direction. Before wiping, apply one drop of cleaning agent to the mirror surface (use either ether-acetone 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 MICRO POINT 2 / 2 R micromanipulator each time before you use the device. Pay special attention to the mirrors and the lens system.
- Check the sharpness of the pilot (aiming) beam. It must be possible to focus the pilot beam sharply on a sheet of paper.

8.3 Repairs and Service

The MICRO POINT 2 / 2 R micromanipulator is factory-repairable only. Report any damage or malfunction to Gebrüder Martin's authorized service partner or contact us direct.

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

Notice! A comprehensive safety check must be carried out once every year in conjunction with the annual safety check required for your laser unit!

9 Technical Data

Dimensions	28 x 7.6 x 5.7 cm
Weight	0.8 kg
Transport Conditions	
Temperature	-40°C to +35°C (-40°F to +95°F)
Relative humidity	5-99% (non-condensing)
Atmospheric pressure	700–1060 mbar
Operating Conditions	
Temperature	+8°C to +35°C (46.4°F to 95°F)
Relative humidity	5–90% (non-condensing)
Atmospheric pressure	700–1060 mbar
Performance Parameters	
Laser wavelength	10,600 nm
Max. laser input power	50 W, continuous-wave (CW) at operating wavelength
Average power transmission	85%

10 Compatibility

The following table provides you with an overview of the various compatibilities between the usable lasers and their software, the scanners and micromanipulators and the corresponding applications.

MCO25/50plus lasers	Software	Scanner	Micromanipulator	Application
Standard pilot laser module	4.00	none	MICRO POINT 2	Manual cutting, with reduced pilot laser brightness
		Soft Scan Plus	MICRO POINT 2	Line Scan, control via laser, reduced brightness
		Soft Scan Plus R	MICRO POINT 2	Line Scan, control via laser, reduced brightness
		none	MICRO POINT 2 R	Manual cutting, with reduced pilot laser brightness
		Soft Scan Plus	MICRO POINT 2 R	Line Scan, control via laser, reduced brightness
		Soft Scan Plus R	MICRO POINT 2 R	Line Scan, control via laser, reduced brightness
ENT pilot laser module	4.00	none	MICRO POINT 2	Manual cutting, with high pilot laser brightness
		Soft Scan Plus	MICRO POINT 2	Line Scan, control via laser
		Soft Scan Plus R	MICRO POINT 2	Line Scan, control via laser
		none	MICRO POINT 2 R	Manual cutting, with high pilot laser brightness
		Soft Scan Plus	MICRO POINT 2 R	Line Scan, control via laser
		Soft Scan Plus R	MICRO POINT 2 R	Line Scan, control via laser
	5.00	none	MICRO POINT 2	Manual cutting, with high pilot laser brightness
		Soft Scan Plus R	MICRO POINT 2	Line Scan, control via laser
		none	MICRO POINT 2 R	Manual cutting, with high pilot laser brightness
		Soft Scan Plus R	MICRO POINT 2 R	Line Scan, control via laser/microswitch

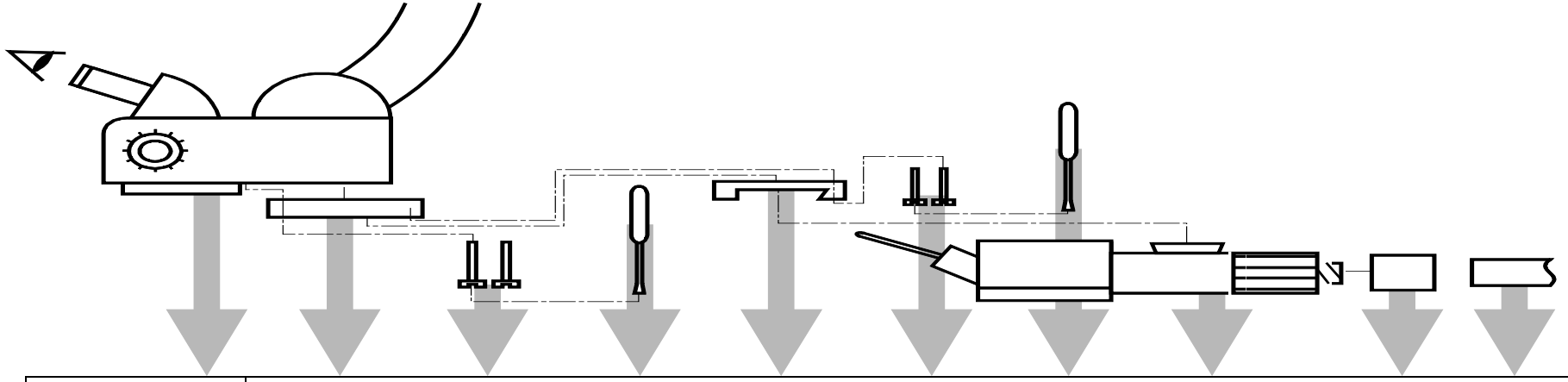
11 Spare Parts / Accessories

The following spare parts and accessories are available from Gebrüder Martin GmbH & Co. KG under the respective Martin item number:

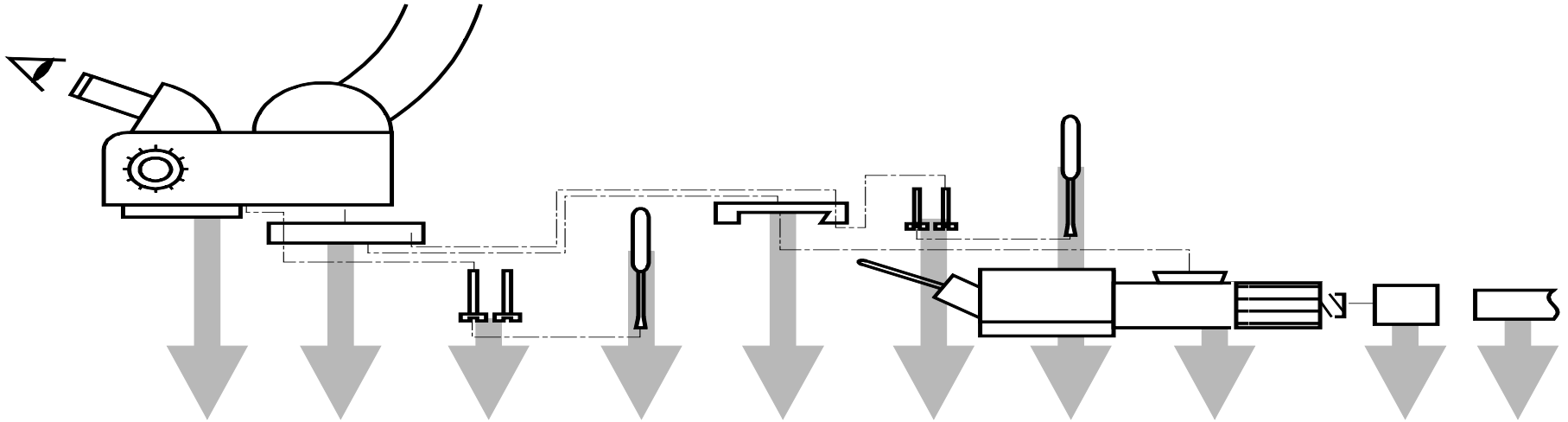
Spare Part / Accessory	Martin Item No.
MICROPOINT 2 MICROMANIPULATOR	76-402-00-04
MICROPOINT 2 R MICROMANIPULATOR	76-412-00-04
Adapter plate, Möller-Wedel	76-401-03-04
Adapter plate, Leica M500; M840/841	76-401-16-04
Adapter plate, Leica M520; M525	76-401-20-04
Adapter plate, Leica M520; M690/ 691/ 695; M650/ 651/ 655; M400E	76-401-01-04
Adapter plate, Olympus OCS-500	76-401-17-04
Adapter plate, Kaps	76-401-11-04
Dovetail plate	08-501-00-11
Laser arm adapter for MCO25/50	08-501-00-10
Adapter for Soft Scan Plus	76-500-42-04
Adapter for Zeiss OPMI drape	76-401-18-04
Adapter for DEKA laser	92-790-30-04
Fixing clip for Soft Scan Plus	76-401-21-04
MICRO POINT 2 / 2 R Operating Instructions	90-857-51-10

12 Annex

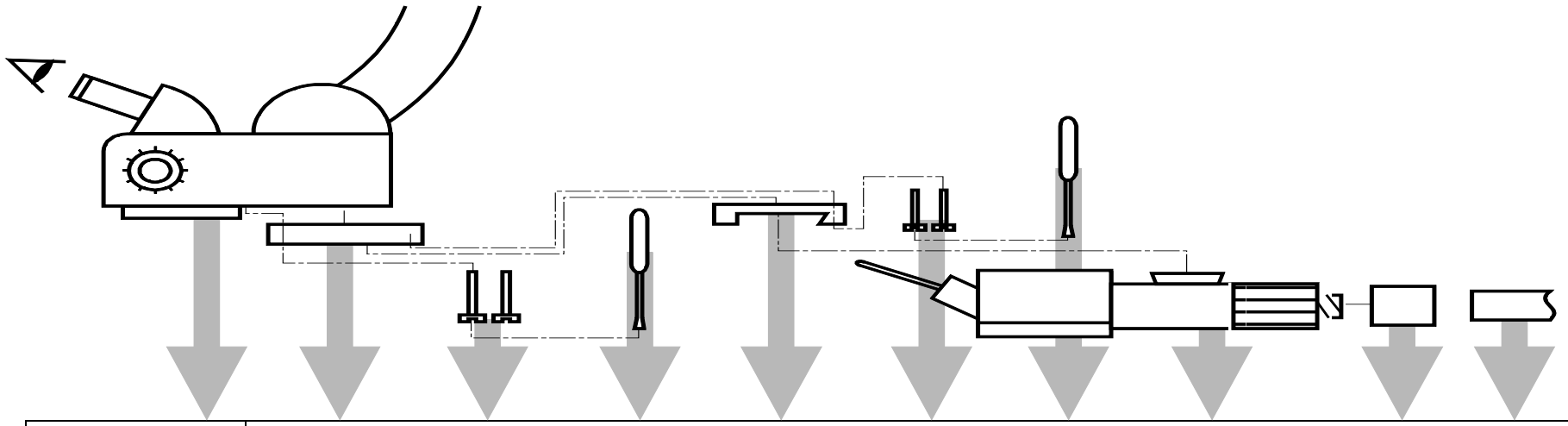
12.1 Attaching the MICRO POINT 2 / 2 R to a Zeiss Microscope



Zeiss	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
OPMI Sensera				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 111/MDO/MDU				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 1				integrated			76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 1 F	No threaded holes provided; conversion to 1 FC possible at Zeiss								
OPMI 1 FC							76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus



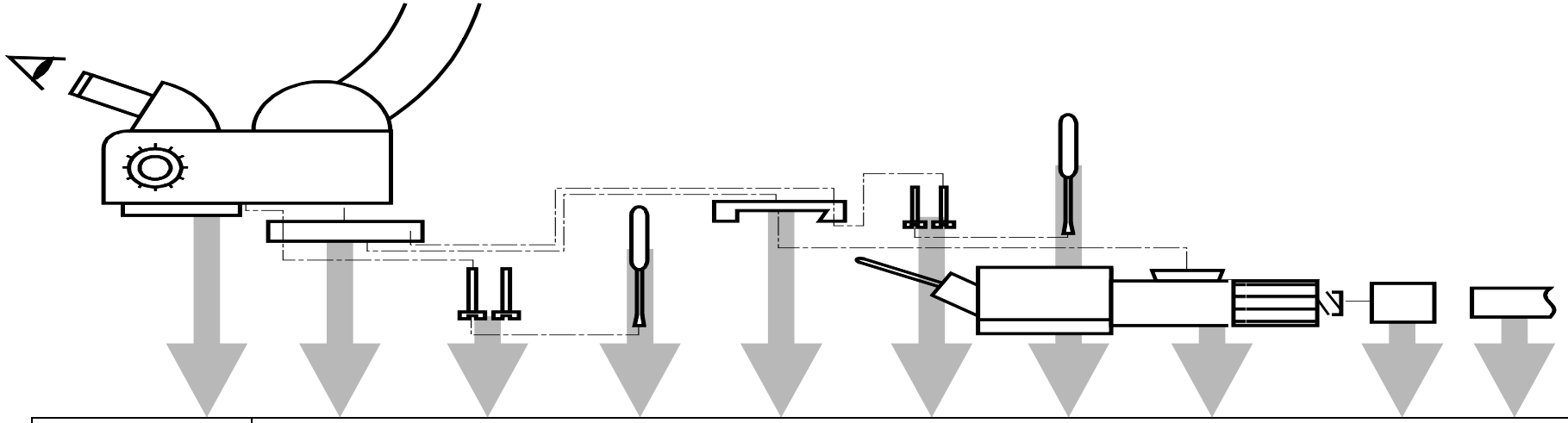
Zeiss	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
OPMI 6				integrated			76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPM 9	Depending on version a) Not possible								
OPMI 9 FC				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 11				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 19 FC				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OPMI 99	Not possible								



Zeiss	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
OPMI ORL				08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus

* Included in package (Allen = hexagonal socket)

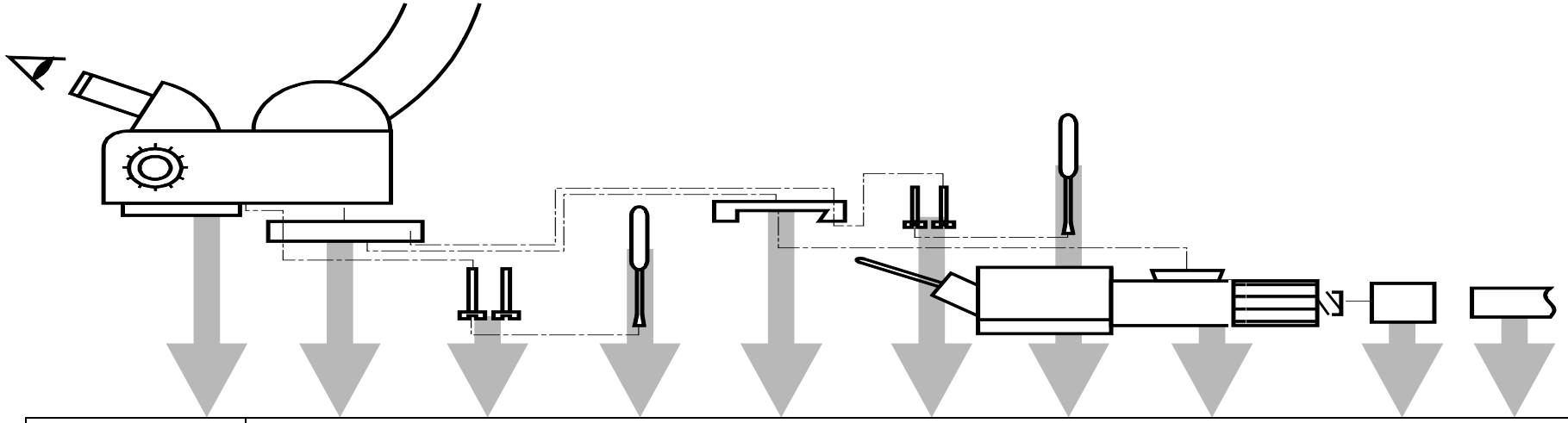
12.2 Attaching the MICRO POINT 2 / 2 R to a Möller Wedel Microscope



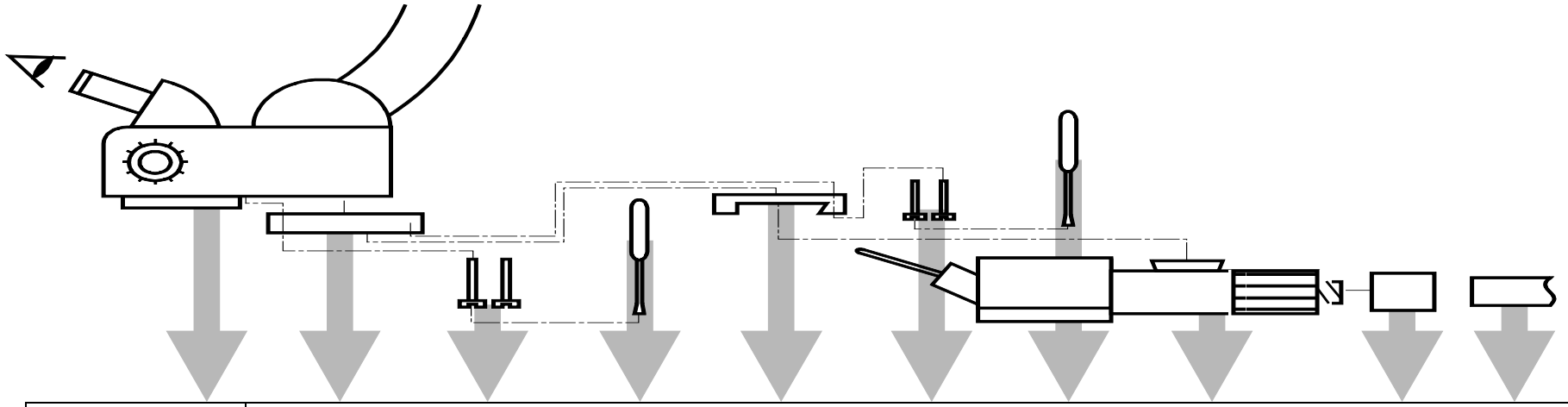
Möller Wedel	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
VM 900	76-401-03	2 x M4		08-501-00-11*			76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
Hi-R 900	76-401-03	2 x M4		08-501-00-11*			76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
Hi-R 1000	76-401-03	2 x M4		08-501-00-11*			76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus

* Included in package (Allen = hexagonal socket)

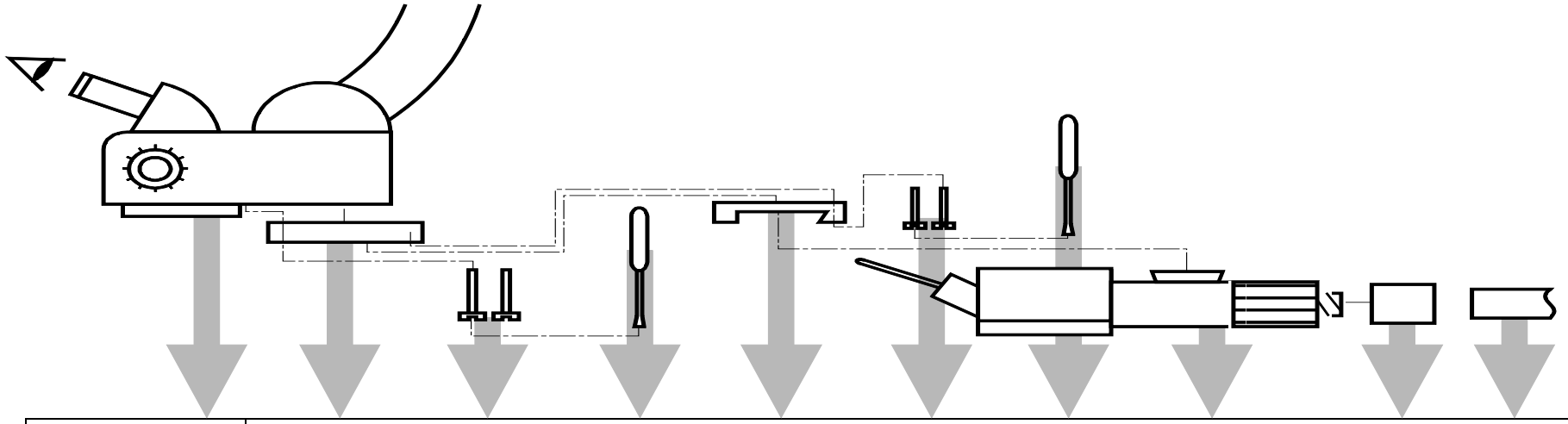
12.3 Attaching the MICRO POINT 2 / 2 R to a Leica Microscope



Leica	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
MC1	Stand for M525								
MS1	Stand for M500 or M520								
M500	76-401-16	4 x DIN7991 M6x16*	Allen wrench, size 4	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
M520	76-401-20	4 x DIN 7991 M6x25*	Allen wrench, size 4*	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
OHS1							76-412-00		



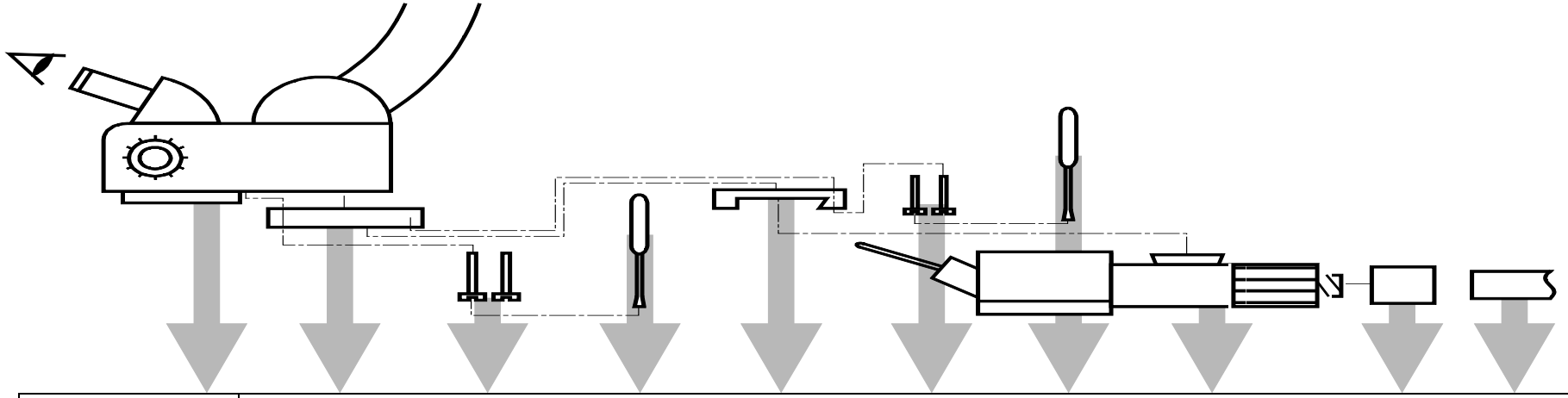
Leica	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
M840/841	76-401-16	4 x DIN7991 M6x16*	Allen wrench, size 4	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
M680	76-401-02	4 x M6x30*	flat-tip	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
M690/691/695	76-401-01	M6x12 DIN 7991*	Allen wrench, size 4*	08-501-00-11*	M3x10* DIN 912	Allen wrench size 2.5*	76-412-00	08-501-00-10*	Laser arm
M650/651/655	76-401-01	M6x12 DIN 7991*	Allen wrench, size 4*	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	76-500-42*	Soft Scan Plus
								08-501-00-10*	Laser arm
M400E	76-401-01	M6x12 DIN 7991*	Allen wrench, size 4*	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00		
								08-501-00-10*	Laser arm



Leica	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
M525	76-401-20	4 x DIN 7991 M6x25*	Allen wrench, size 4*	08-501-00-11*	M3x10* DIN 912	Allen wrench, size 2.5*	76-412-00	76-500-42*	Soft Scan Plus
								08-501-00-10*	Laser arm

* Included in package (Allen = hexagonal socket)

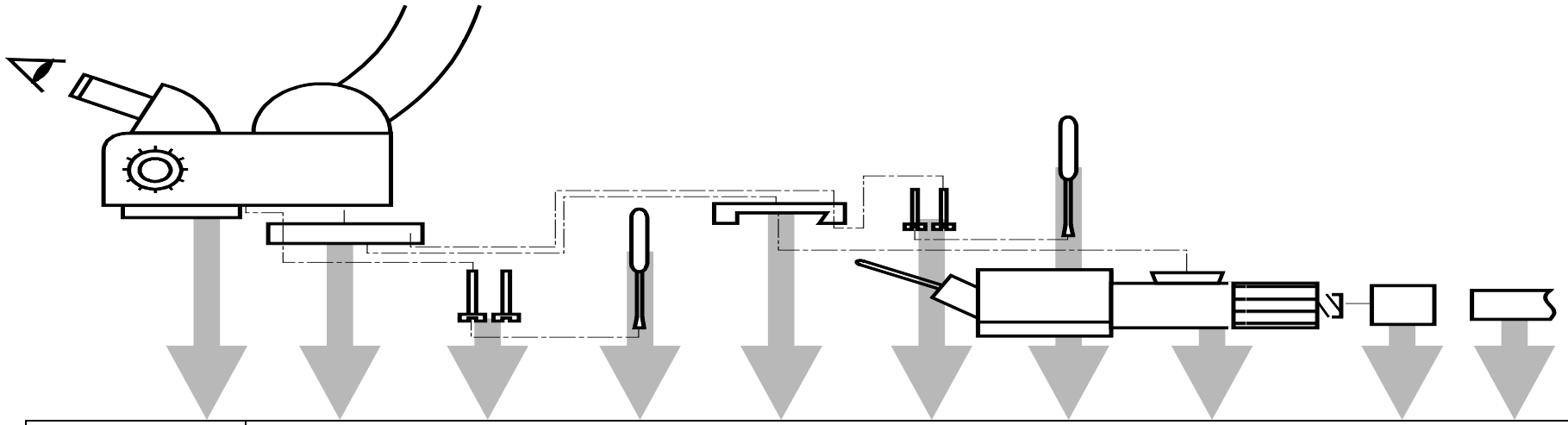
12.4 Attaching the MICRO POINT 2 / 2 R to a Kaps Microscope



Kaps	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
SOM 32	76-401-11-04	2 x M4x10*	Allen wrench, size 3*	08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
SOM 42	76-401-11-04	2 x M4x10*	Allen wrench, size 3*	08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
SOM 52	76-401-11-04	2 x M4x10*	Allen wrench, size 3*	08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus
SOM 62	76-401-11-04	2 x M4x10*	Allen wrench, size 3*	08-501-00-11*	M3x14* slotted	3.5 x 100, flat-tip	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus

* Included in package (Allen = hexagonal socket)

12.5 Attaching the MICRO POINT 2 / 2 R to an Olympus Microscope



Olympus	**KLS Martin**								
Type of Operating Microscope	Adapter Plate	Screws	Screwdriver	Dovetail Plate	Screws	Screwdriver	MICRO POINT	Adapter Ring	Beam Delivery
OCS-500	76-401-17-04	4 x DIN 912 M4x10	Allen wrench, size 3	08-501-00-11*	4 x DIN 912 M3x8	Allen wrench, size 2.5	76-412-00	08-501-00-10*	Laser arm
								76-500-42*	Soft Scan Plus

* Included in package (Allen = hexagonal socket)

Intended for your personal notes

KLS Martin Group

Karl Leibinger Medizintechnik GmbH & Co. KG
78570 Mühlheim · Germany
Tel. +49 74 63 838-0
info@klsmartin.com

KLS Martin France SARL
68000 Colmar · France
Tel. +33 3 89 21 66 01
france@klsmartin.com

Nippon Martin K.K.
Osaka 541-0046 · Japan
Tel. +81 6 62 28 90 75
nippon@klsmartin.com

KLS Martin Malaysia Snd. Bhd.
10200 Penang · Malaysia
Tel. +604 263 2566
malaysia@klsmartin.com

KLS Martin GmbH + Co. KG
79224 Umkirch · Germany
Tel. +49 76 65 98 02-0
info@klsmartin.com

Martin Italia S.r.l.
20864 Agrate Brianza (MB) · Italy
Tel. +39 039 605 67 31
italia@klsmartin.com

KLS Martin L.P.
Jacksonville, Fl 32246 · USA
Office phone +1 904 641 77 46
usa@klsmartin.com

Gebrüder Martin GmbH & Co. KG
Representative Office
121471 Moscow · Russia
Tel. +7 (499) 792-76-19
russia@klsmartin.com

Stuckenbrock Medizintechnik GmbH
78532 Tuttlingen · Germany
Tel. +49 74 61 16 58 80
verwaltung@stuckenbrock.de

Martin Nederland/Marned B.V.
1270 AG Huizen · The Netherlands
Tel. +31 35 523 45 38
nederland@klsmartin.com

KLS Martin do Brasil Ltda.
CEP 04.531-011 São Paulo · Brazil
Tel. +55 11 3554 2299
brazil@klsmartin.com

Gebrüder Martin GmbH & Co. KG
Representative Office
201203 Shanghai · China
Tel. +86 21 5820 6251
china@klsmartin.com

Rudolf Buck GmbH
78570 Mühlheim · Germany
Tel. +49 74 63 99 516-30
info@klsmartin.com

KLS Martin UK Ltd.
Reading RG1 3EU · United Kingdom
Tel. +44 (0) 1189 000 570
info.uk@klsmartin.com

KLS Martin Australia Pty Limited
Artarmon NSW 2064 · Australia
Tel. +61 2 9439 5316
australia@klsmartin.com

Gebrüder Martin GmbH & Co. KG
Representative Office
Dubai · United Arab Emirates
Tel. +971 4 454 1655
middleeast@klsmartin.com

Gebrüder Martin GmbH & Co. KG
Ein Unternehmen der KLS Martin Group
KLS Martin Platz 1 · 78532 Tuttlingen · Germany
Postfach 60 · 78501 Tuttlingen · Germany
Tel. +49 7461 706-0 · Fax 706-193
info@klsmartin.com · www.klsmartin.com

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