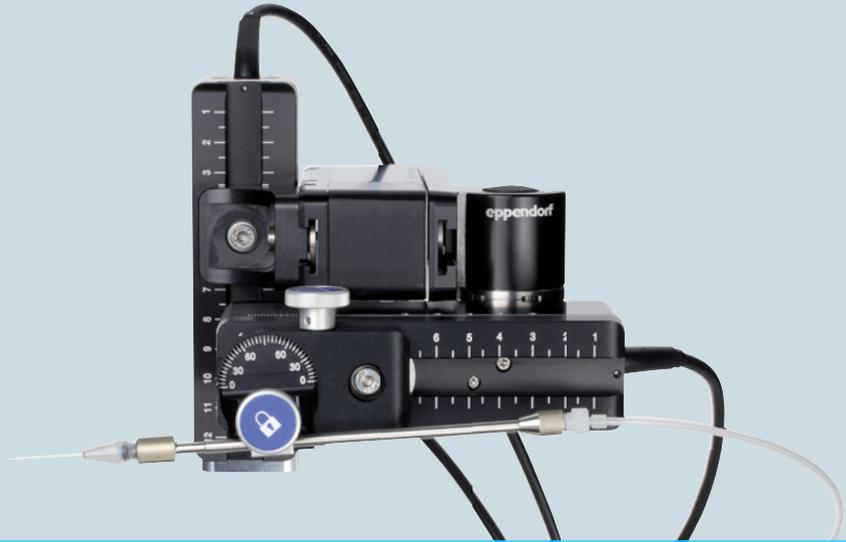


Register your instrument!
www.eppendorf.com/myeppendorf



TransferMan[®] 4m

Instructions for Use

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1 Operating instructions

1.1 Using this manual

- ▶ Read this entire manual before using the device for the first time. Also observe the manuals of any accessories if used.
- ▶ This manual is part of the product. Keep it in a place that is easily accessible.
- ▶ Include this manual when transferring the device to a third party.
- ▶ The current version of the manual for all available languages can be found on our webpage www.eppendorf.com/manuals.

1.2 Danger symbols and danger levels

1.2.1 Danger symbols

The safety instructions in this manual have the following danger symbols and danger levels:

	Cuts		Electric shock
	Hazard point		Material damage

1.2.2 Danger levels

DANGER	Will lead to severe injuries or death.
WARNING	May lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Depiction	Meaning
1.	Actions in the specified order
2.	
▶	Actions without a specified order
•	List
<i>Text</i>	Display or software texts
	Additional information

2 Safety

2.1 User notes

The applicable user instructions are subject to the regulations of the country to which the device is sold. The availability of a TransferMan 4m for clinical use depends on the approval status of the TransferMan 4m in the country where the device is to be sold.

2.2 Intended use

The TransferMan 4m has been designed and manufactured to assist in the positioning of micro tools (e.g., microcapillaries or micro glass pipettes) under the microscope, during the performance of assisted reproductive technologies (ART) such as intracytoplasmic sperm injection (ICSI), or the collection of genetic material for the purpose of genetic preimplantation testing (PGT).

The TransferMan 4m is therefore a medical device in accordance with the Directive 93/42/EEC of the European Union. It must only be used indoors and only by sufficiently trained specialists.

2.3 Warnings for intended use



WARNING! Risk of injury due to flying capillaries and glass splinters.

If exposed to high pressures, capillaries may detach themselves from the grip heads and become projectiles.

Capillaries can crack as a result of incorrect handling.

- ▶ Wear protective goggles.
- ▶ Never aim capillaries at people.
- ▶ Use capillaries with an outer diameter that matches the grip head specifications.
- ▶ Always mount / dismount capillaries when they are depressurized.
- ▶ Mount the capillary correctly in the grip head.
- ▶ Do not touch the capillary with the Petri dish or other objects.



CAUTION! Risk of cuts from broken capillaries.

Capillaries are made of glass. They are very sharp and fragile.

- ▶ Wear your personal protective equipment (PPE).
- ▶ Always mount capillaries depressurized.
- ▶ Never aim capillaries at people.
- ▶ Handle the capillaries very carefully.



NOTICE! Mechanical damage to the motor modules.

Excessive load leads to increment errors or destruction of the drive.

- ▶ Do not drive the modules against mechanical obstructions.
- ▶ Do not hold any objects near the modules.
- ▶ Load the motor module with a maximum of 200 g.



NOTICE! Device malfunction

Do not use mobile phones or other mobile communication equipment during operation.

- ▶ Keep at least a distance of 2 meters.



WARNING! Damage to health due to infectious liquids and pathogenic germs.

- ▶ When handling infectious liquids and pathogenic germs, observe the national regulations, the biosafety level of your laboratory, and the manufacturers' Safety Data Sheets and application notes.
- ▶ Wear your personal protective equipment.
- ▶ Consult the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, as amended) for comprehensive regulations on the handling of germs or biological material of risk group II or higher.



CAUTION! Poor safety due to incorrect accessories and spare parts.

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, functioning and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of accessories and spare parts other than those recommended or from improper use.

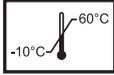
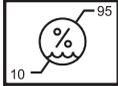
- ▶ Only use accessories and original spare parts recommended by Eppendorf.

2.4 Warning symbols on the device

Warning symbol	Meaning
	Warns of the risk of injury caused by capillary tips
	Warns of the risk of crushing on the motor module
	Warns of magnetic fields
	Read the instructions for use

2.5 Symbols used on the name plate and packing

Symbol	Meaning
	Global Trade Item Number
	Batch code
	Article number
	Serial number
	Medical device

Symbol	Meaning
	Manufacturer
	Production date
	Read the instructions for use
	Permissible storage temperature range
	Permissible storage humidity range
	Fuse
 	Symbol for waste electrical and electronic equipment (WEEE) according to EU Directive 2012/19/EU, European Community
	UL listing certification mark: Declaration of conformity, USA
	CE conformity

2.6 User profile

The device and accessories may only be operated by trained and skilled personnel.

Before use, read the manual of the device and the manual of the accessories carefully and familiarize yourself with the device's mode of operation.

2.7 Information on product liability

In the following cases, the designated protection of the device may be affected. The liability for any resulting damage or personal injury is then transferred to the owner:

- The device is not used in accordance with the manual.
- The device is used outside of its intended use.
- The device is used with accessories or consumables which are not recommended by Eppendorf SE.
- The device is maintained or repaired by persons who were not authorized by Eppendorf SE.
- The user makes unauthorized changes to the device.

2.8 Obligation to report accidental damage or damage to the device

As the operator of a medical device, you are obliged to report serious accidents or injuries to persons caused by our device to the following authorities:

- The competent local authorities
- Eppendorf SE
- Your local Eppendorf distributor

2.8.1 Manufacturer Eppendorf SE

Eppendorf SE

Barkhausenweg 1

22339 Hamburg

GERMANY

eppendorf@eppendorf.com

2.8.2 Local Eppendorf distributor

www.eppendorf.com/contact

3 Product description

3.1 Delivery package

Quantity	Description
1	X-module
1	Y-module
1	Z-module
1	YZ connector
1	Swivel joint
1	Angle head
1	Control board
1	Mains/power cord
1	Cable sheathing
1	Instructions for use
1	Unpacking instructions

3.1.1 Tools

Quantity	Description
7	Allen key, 1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm
1	Allen torque screwdriver, 3 mm
1	Allen screwdriver, 1.3 mm
1	Tool bag

3.1.2 Accessories

Quantity	Description
2	Positioning aid for capillary holder
1	Spare parts kit

Product description

TransferMan® 4m

English (EN)

3.2 Features

The micromanipulator has been especially developed for work processes that require intuitive movement of the capillary.

The TransferMan 4m combines the classic benefits of a mechanical system with the benefits of an accurate electrically driven system.

The capillary is controlled by a joystick. The joystick has an inner (proportional) and an outer (dynamic) movement range. In the inner range, the joystick movement is transferred directly to the capillary. In the outer range, a greater forwards or backwards movement of the joystick results in an acceleration of the capillary movement. The movement ranges enable moving to any position in the working range of the micromanipulator.

Proportional movement is suitable for all working techniques that require intuitive, sensitive handling, e.g., intracytoplasmic sperm injection (ICSI).

The software control provides predefined applications, freely programmable softkey functions, a freely programmable application and the storage of different positions in all spatial coordinates.

3.2.1 Approved accessories

The following accessories from Eppendorf are approved for use with the TransferMan 4m:

- CellTram 4m Air
- CellTram 4m Oil
- Capillary holder 4
- Microscope adapter
- Universal stand

The following third-party accessories are approved for use with the TransferMan 4m:

- Capillary for medical applications (according to the specifications for CellTram 4m Air/CellTram 4m Oil)

3.3 Product overview

The motor module is mounted on a special microscope adapter or on a free-standing tripod (magnetic). The control board is separated from the motor module and the microscope in terms of vibration.

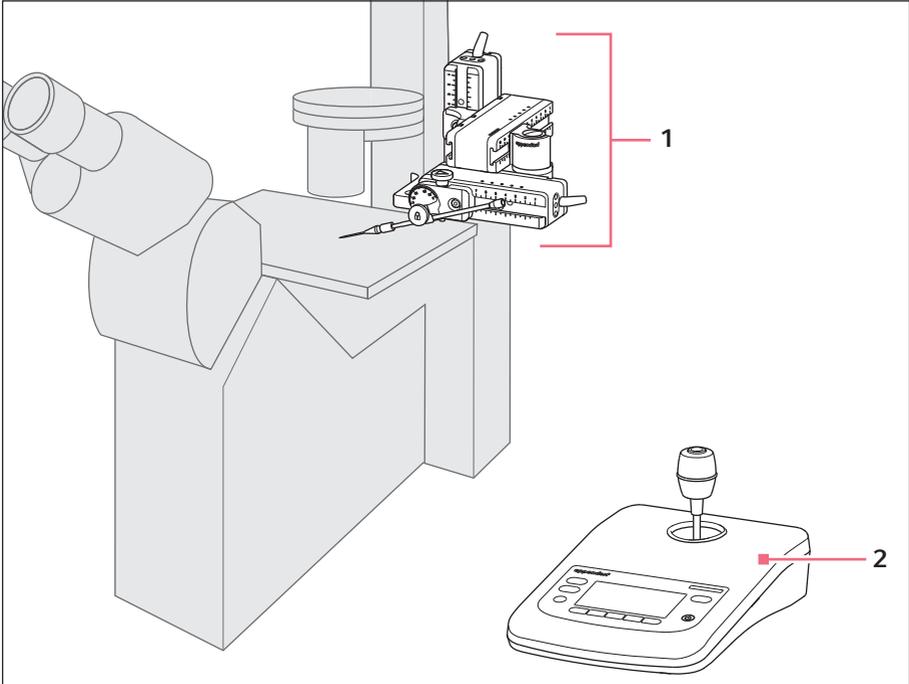


Fig. 3-1: TransferMan 4m – right side mounting

1 Motor module

X-module, Y-module and Z-module

2 Control board

Product description

TransferMan® 4m

English (EN)

3.3.1 Motor module

The motor module consists of three modules (X, Y and Z-modules). Each module enables movement along a spatial axis. On the X-module, capillary holder 4 is attached to the angle head and the injection angle of the capillary can be set as required. The X-module can be swung out of the working range using the swivel joint.

- i** Capillary holder 4 is not included in the scope of delivery of the TransferMan 4m micromanipulator. Capillary holder 4 is available with the CellTram 4m Air/Oil microinjector.

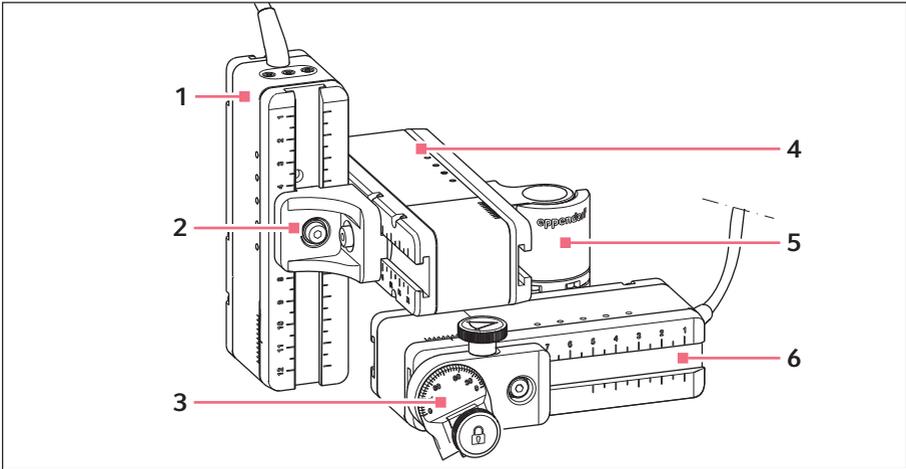


Fig. 3-2: Motor module – right side mounting

- | | |
|-----------------------|-----------------------|
| 1 Z-module | 4 Y-module |
| 2 YZ connector | 5 Swivel joint |
| 3 Angle head | 6 X-module |

3.3.2 Microscope adapter

Special microscope adapters are available for various microscope types from different manufacturers. The motor module is mounted on a microscope adapter. The microscope adapters are mounted either horizontally or vertically.

- i** The microscope adapter is not included in the delivery package.

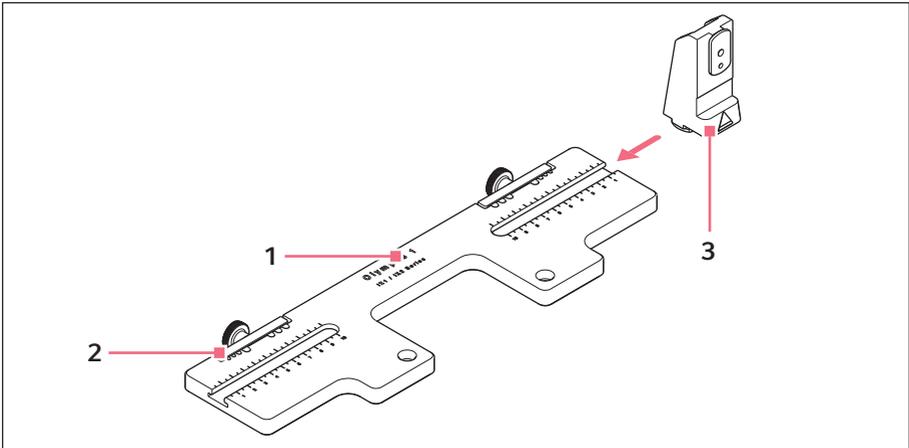


Fig. 3-3: Microscope adapter for horizontal mounting – example: Olympus 1

1 Adapter designation

With indication of the microscope type

3 Z-module holder

For horizontally mounted microscope adapters

2 Cable conduit

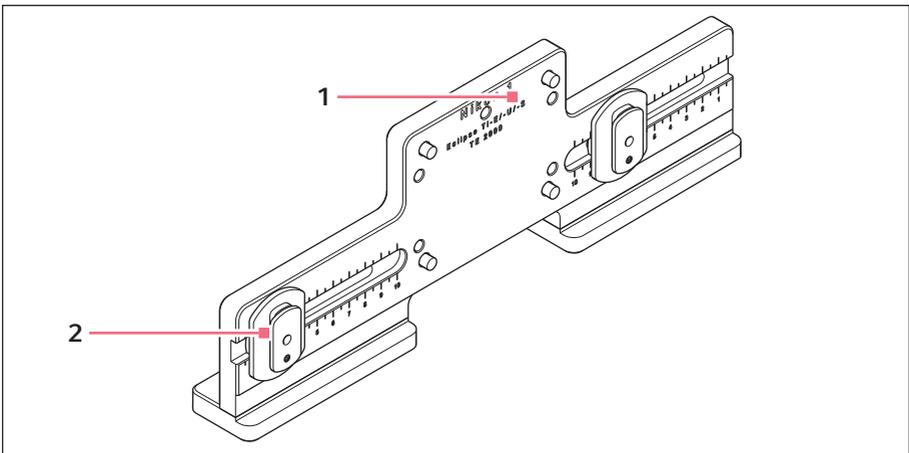


Fig. 3-4: Microscope adapter for vertical mounting – example: Nikon 1

1 Adapter designation

With indication of the microscope type

2 Z-slider

For vertically mounted microscope adapters

3.3.3 Control board

The control board contains the key pad, the display and the joystick, and, to the side, the selection dial. The direction of movement and the speed of the joystick are transferred to the capillary. The responsivity of the movement and the size of the working range are predefined in the software setting. On the control panel, the working range can be selected and individually changed using the selection dial.

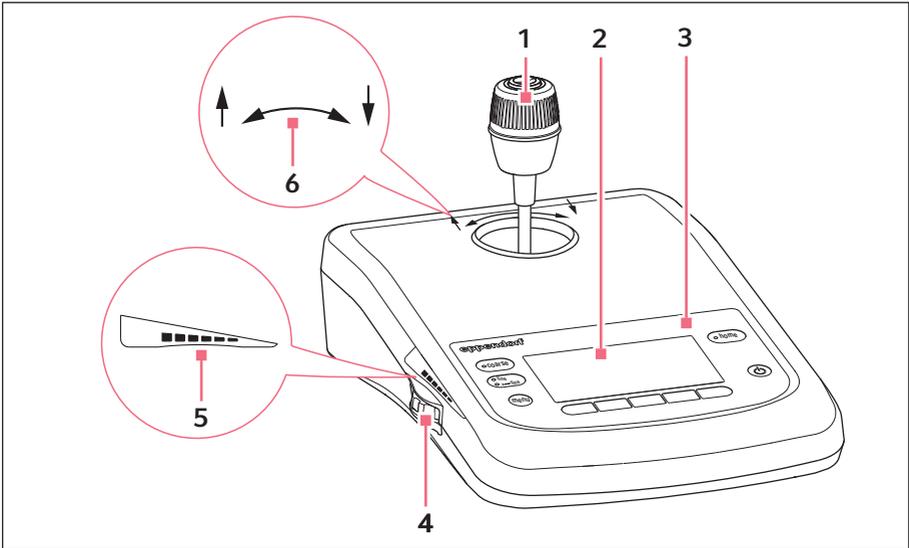


Fig. 3-5: Control board – front

- | | |
|--|---|
| <p>1 Joystick
Proportional and dynamic movement</p> <p>2 Display</p> <p>3 Control panel</p> | <p>4 Selection dial
For increasing or reducing the working range</p> <p>5 Marking for increasing or reducing the working range</p> <p>6 Marking indicating the direction of rotation of the Z-axis</p> |
|--|---|

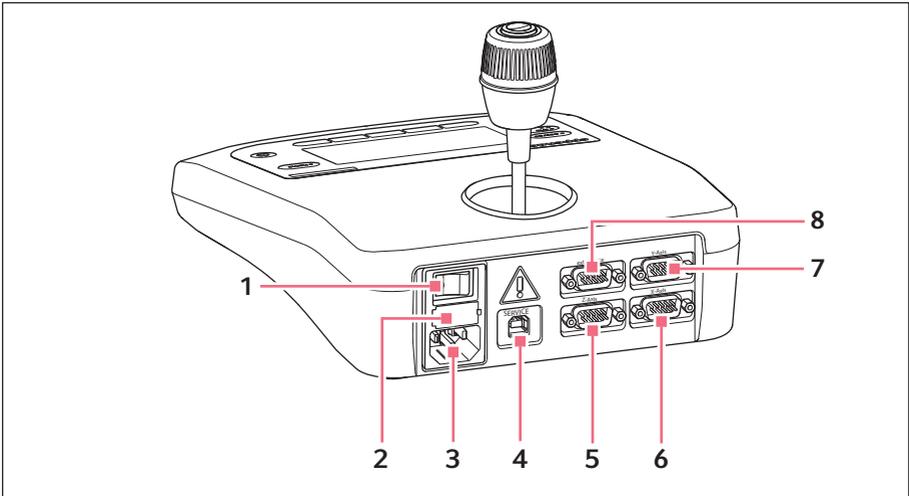


Fig. 3-6: Control board – rear

- | | |
|-----------------------------|-------------------------------------|
| 1 Mains/power switch on/off | 5 Connection for a Z-module |
| 2 Micro fuse | 6 Connection for an X-module |
| 3 Mains/power connection | 7 Connection for a Y-module |
| 4 Service connection | 8 Connection for an external device |

3.3.4 Tools

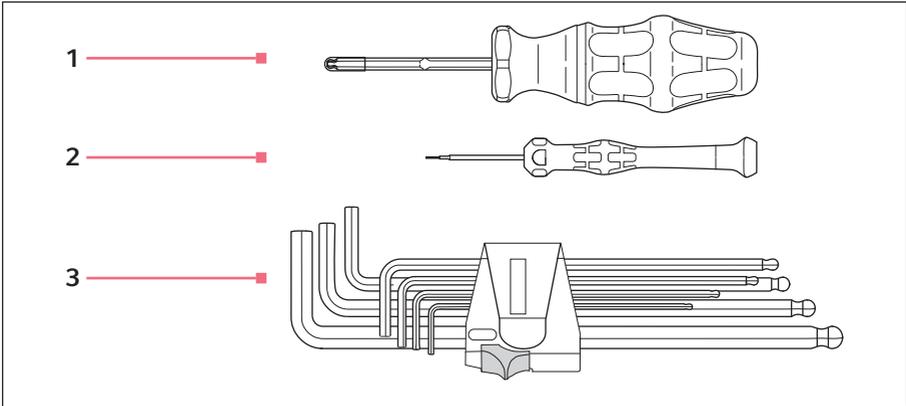


Fig. 3-7: Tools

1 Allen torque screwdriver

3 mm

2 Allen screwdriver

1.3 mm

3 Allen key

1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm

3.4 Control panel

With the keys on the control panel you can switch on the control board and select the size of the working range. The softkeys are used to open applications, execute functions, navigate the menu and set parameters.

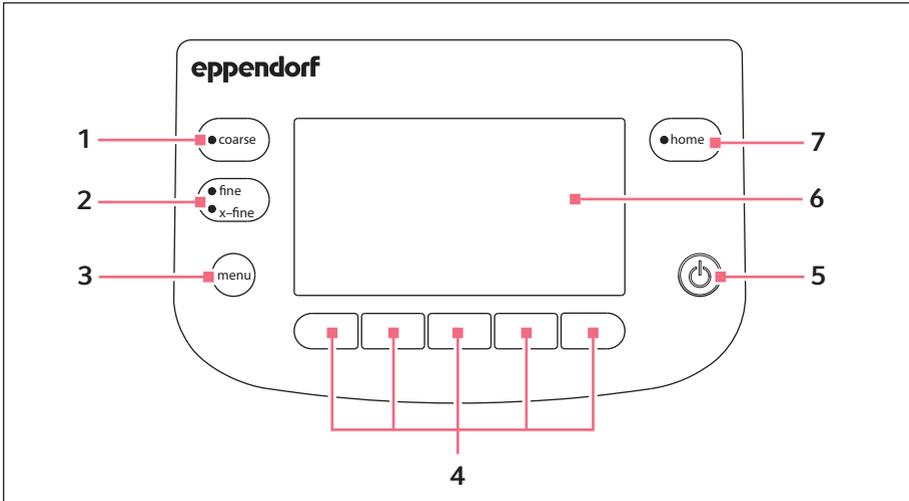


Fig. 3-8: Control panel

- | | |
|---|---|
| <p>1 coarse key
Sets the large working range</p> <p>2 fine/x-fine key
Sets the medium or small working range</p> <p>3 menu key
Opens the menu</p> <p>4 Softkeys 1 – 5
Select an application, trigger a function, navigate or set parameter values</p> | <p>5 standby key
Switches the control board on or off or cancels automatic movements</p> <p>6 Display
Displays the software</p> <p>7 home key
Moves the capillary out of the working range to a defined position</p> |
|---|---|

Product description

TransferMan® 4m

English (EN)

3.5 Joystick

The joystick moves the capillary in all three spatial axes. The joystick movement is transferred directly to the capillary in the proportional range. In the dynamic range, the movement of the capillary is accelerated the further the joystick is moved forwards and backwards.

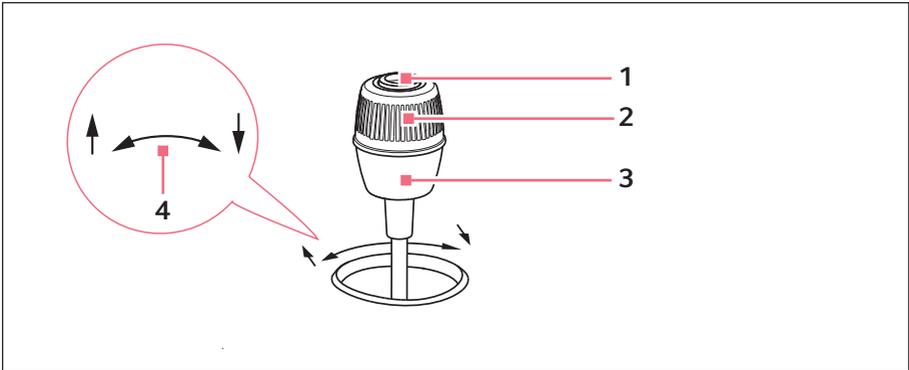


Fig. 3-9: Joystick

1 Joystick key**2 Swivel**

Controls movements in the Z-axis

3 Lower part

Controls movements in the X and Y-axis

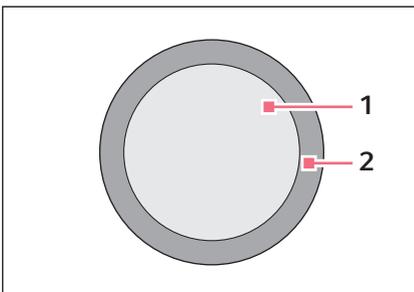
4 Marking indicating the direction of rotation of the Z-axis

Fig. 3-10: Movement ranges of the joystick

1 Proportional range**2 Dynamic range**

3.5.1 Proportional range

In the proportional range, the capillary will move as quickly or slowly as the joystick is moved. The travel of the capillary is also proportional to the distance that the joystick has been moved forwards and backwards. The movement of the capillary will stop as soon as the joystick is no longer moved or when the position is reached at which the joystick was stopped. There is a noticeable stop on the outer limit of the proportional range. This stop is in a narrow zone in which moving the joystick sideways does not result in any further movement of the capillary.

The size of the proportional range depends on the working range selected.

3.5.2 Dynamic range

After the stop, the dynamic range of the joystick begins: When the joystick is moved against the spring-loaded stop, the capillary starts moving in the direction of the joystick movement. The movement stops when the joystick is released and it drops back into the zone due to the spring force of the stop. The speed of the capillary in the dynamic range is increased dynamically by a stronger pressure against the stop.

The size of the dynamic range is limited by the movement range of the modules (X and Y).

3.5.3 Direction of movement of the joystick

The joystick can be moved along the horizontal plane. This controls the motors of the X-module and the Y-module. The joystick can be moved in one axis at a time or in a combination of axes.

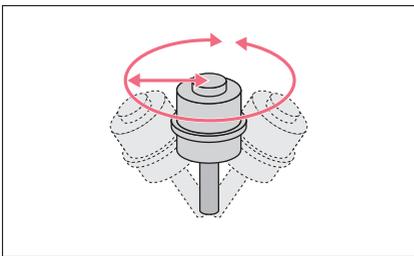


Fig. 3-11: Movement in the X and Y-axis

- Move the capillary in the horizontal direction (X and Y-axis).

Product description

TransferMan® 4m

English (EN)

3.5.4 Direction of movement of the rotating wheel

The rotating wheel on the joystick moves the motor module in the vertical axis. This activates the motor of the Z-module.

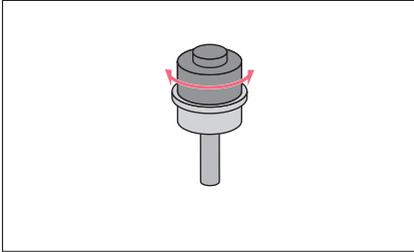


Fig. 3-12: Movement in the Z-axis

- ▶ Move the capillary in the vertical direction (Z-axis).
Clockwise rotation (to the right): The Z-motor moves downwards.
Counter-clockwise rotation (to the left): The Z-motor moves upwards.

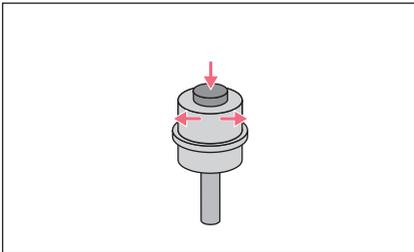
3.5.5 Joystick key functions

Fig. 3-13: No movement of the capillary

- ▶ Uncouple the joystick from the motor module.
- ▶ Trigger functions (e.g., switch between saved positions).

3.6 Working range

There are three working ranges within the movement range of the joystick. For each working range, a radius with a resulting speed ratio is preset. The radius can be set using the selection dial on the control board and in the *Speed* menu.

Working ranges:

- *coarse* – for a large working range
- *fine* – for a medium working range
- *x-fine* – for a small working range

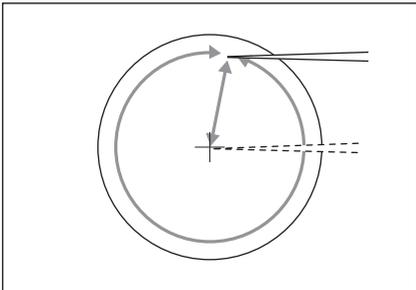


Fig. 3-14: Large working range – *coarse*

- ▶ Move capillary over a large distance.
- ▶ Position capillary roughly and quickly.

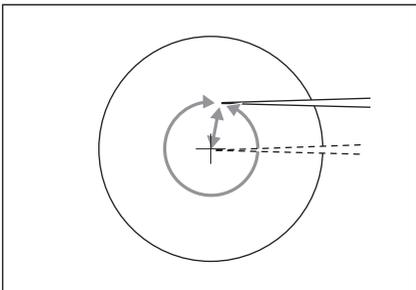


Fig. 3-15: Medium working range – *fine*

- ▶ Move capillary over a medium distance.
- ▶ Position capillary precisely.

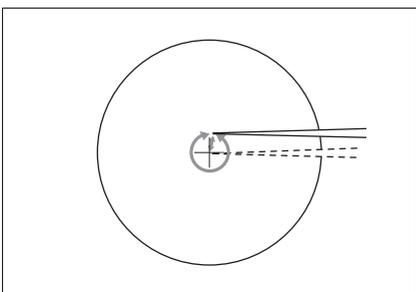


Fig. 3-16: Small working range – *x-fine*

- ▶ Move capillary over a very short distance.
- ▶ Position capillary very precisely and slowly.
- ▶ Active for *x-fine* working range larger than 0.

3.7 Resulting speed

In the inner (proportional) range, the speed of the capillary is dependent on the speed at which the joystick is moved forwards and backwards and the size of the set working range. If the joystick is moved forwards and backwards at the same speed with, e.g., the setting *fine* or *coarse*, the resulting speed with the smaller *fine* working range is less than with the larger *coarse* range.

The speed of the outer (dynamic) range is coupled to the selected working range. The coupling factor (*Dyn-factor*) can be changed and adjusted in the *Installation* menu. Since the speed results from the working range, the settings for Coarse fine and x-fine can be adjusted in the *Speed* menu.

4 Installation

4.1 Preparing installation



NOTICE! Damage to the control board as a result of incorrect handling.

- ▶ Grasp the control board on the housing.
 - ▶ Do not lift the control board using the joystick.
 - ▶ Never place the control board on the joystick.
-



Keep the packaging and the transport securing devices for later transport or storage.



Do not operate the device if there is visible damage to the device and/or to its packaging.

1. Check the packaging for damage.
2. Carefully remove the motor module and the control board from the packaging.
3. Check that everything is included in the delivery.
4. Check the modules, the control board and the accessories for damage.

4.1.1 Complaints about damages

1. Contact customer service (see *Contact details on p. 98*).

4.1.2 Incomplete delivery

1. Contact customer service (see *Contact details on p. 98*).

4.1.3 Microscope adapter assembly

The microscope adapter from Eppendorf is not included in the scope of delivery and must be ordered separately.

1. Assemble the microscope adapter in accordance with the instructions for the microscope adapter.

4.2 Selecting the location

Select the location for the device according to the following criteria:

- Mains/power connection in accordance with the name plate.
 The mains/power supply must be equipped with a residual current circuit breaker.
- A bench with a horizontal and even work surface which is designed to support the weight of the devices.
- A mat or bench that is cushioned against vibrations.
- A mat or bench that is cushioned against vibrations.



The mains/power switch and the disconnecting device for the mains/power line must be easily accessible during operation (e.g., a residual current circuit breaker).

4.3 Mounting overview

4.3.1 Mounting with horizontal microscope adapter

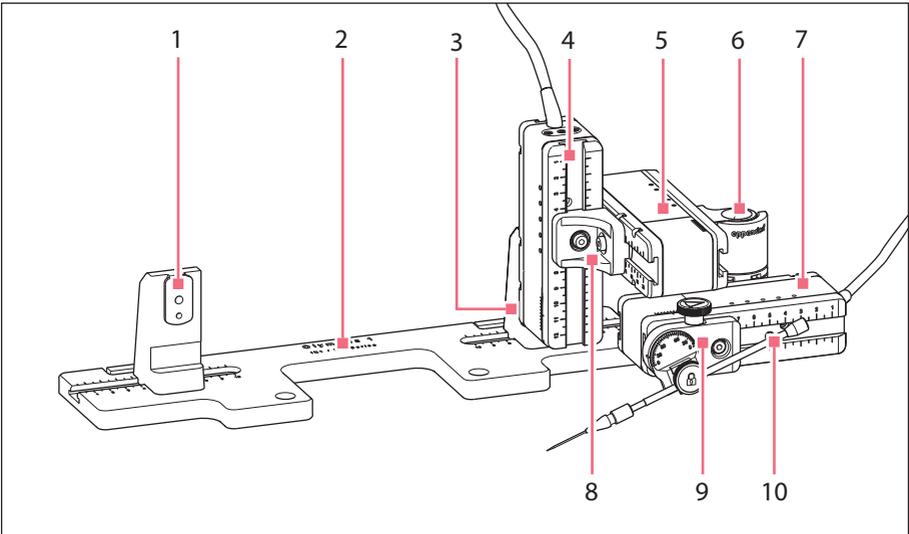


Fig. 4-1: Overview for right side mounting

- | | |
|--|--|
| 1 Z-module holder
Position for left side mounting | 6 Swivel joint |
| 2 Designation of the microscope adapter | 7 X-module |
| 3 Z-module holder
Position for right side mounting | 8 YZ connector |
| 4 Z-module | 9 Angle head |
| 5 Y-module | 10 Capillary holder 4
(not included in the delivery package) |

4.3.2 Mounting with vertical microscope adapter

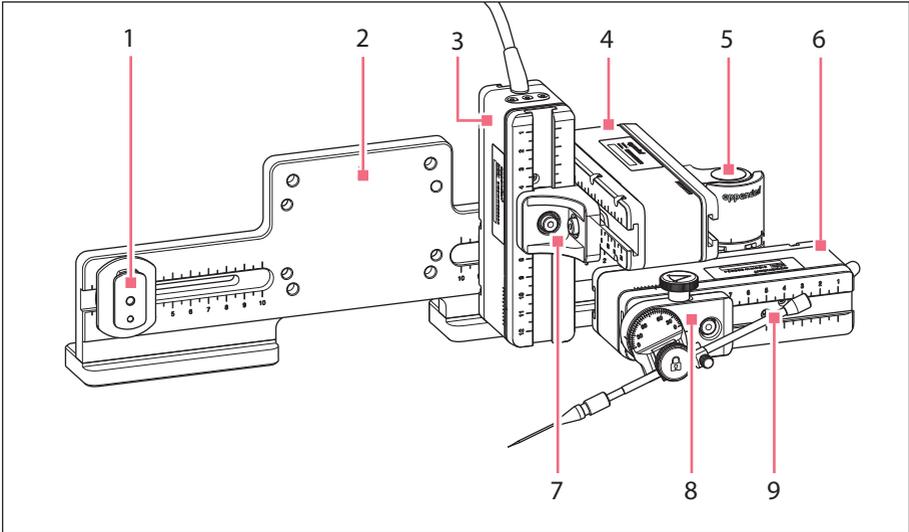


Fig. 4-2: Overview for right side mounting

- | | |
|---|--|
| 1 Z-slider | 6 X-module |
| 2 Designation of the microscope adapter | 7 YZ connector |
| 3 Z-module | 8 Angle head |
| 4 Y-module | 9 Capillary holder
(not included in the delivery package) |
| 5 Swivel joint | |

4.3.3 Module (X, Y, Z)

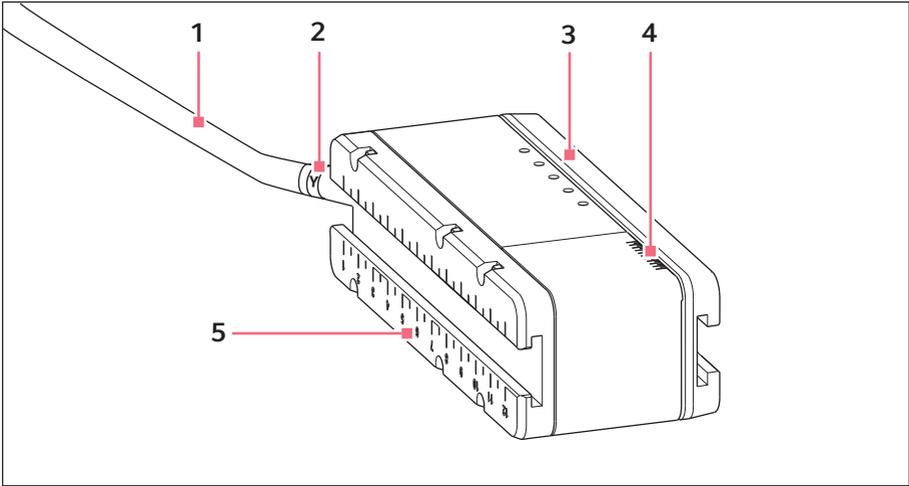


Fig. 4-3: Y-module (example)

- | | |
|--------------------------------|--|
| 1 Cable | 4 Scale
Movement range of the rail |
| 2 Module identification | |
| 3 Movable rail | 5 Fixed rail |

4.3.4 Z-module holder – horizontal microscope adapter

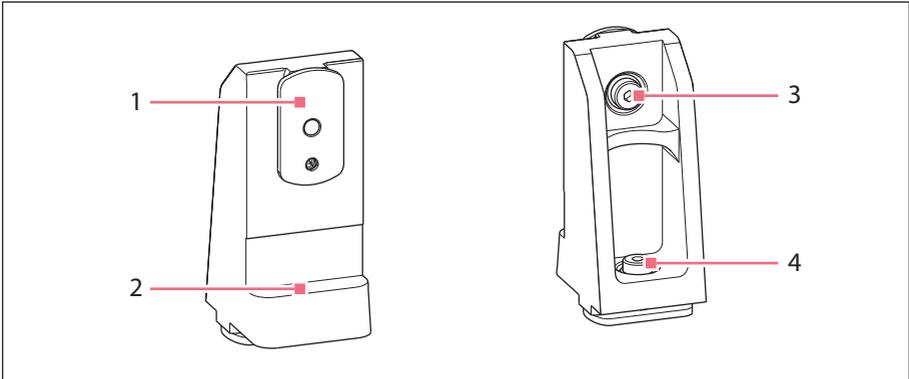


Fig. 4-4: Z-module holder, front and back

- | | |
|---------------------|---|
| 1 Slider | 3 Screw
Attach Z-module |
| 2 Stop angle | 4 Screw
Attach Z-module holder to the adapter |

4.3.5 Slider

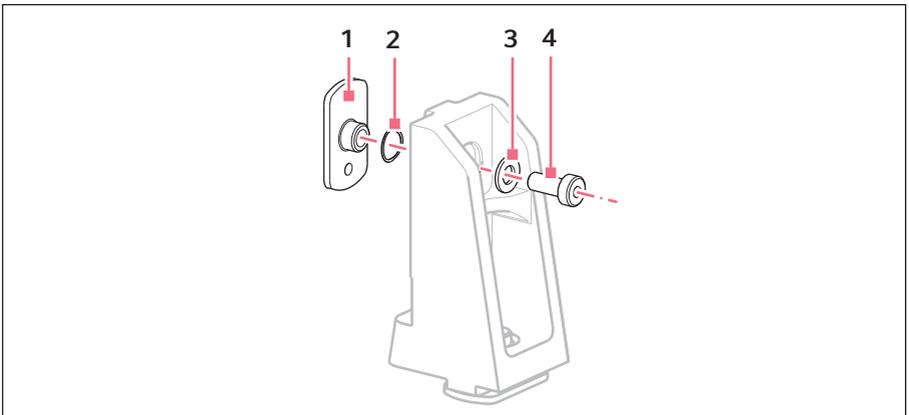


Fig. 4-5: Slider – position of the washers on the Z-module holder as an example

- | | |
|----------------------|----------------------|
| 1 Slider | 3 Flat washer |
| 2 Lock washer | 4 Screw |

4.3.6 Z-slider – vertical microscope adapter

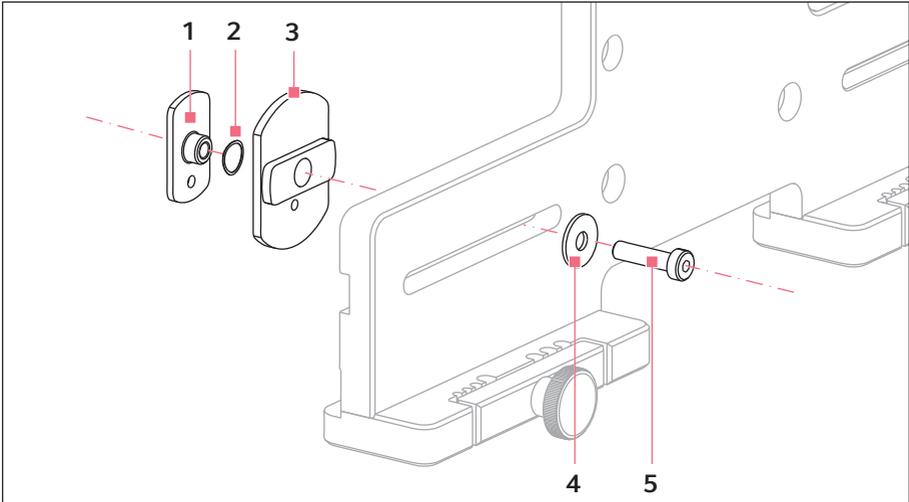


Fig. 4-6: Z-slider – position of the washers on the vertical adapter as an example

- | | |
|----------------------|----------------------|
| 1 Slider | 4 Flat washer |
| 2 Lock washer | 5 Screw |
| 3 Z-slider | |

4.3.7 Angle head

The angle head is supplied ready for right side mounting. For left side mounting, the position of the fixing screw has to be changed and the holder for the capillary holder has to be turned accordingly.

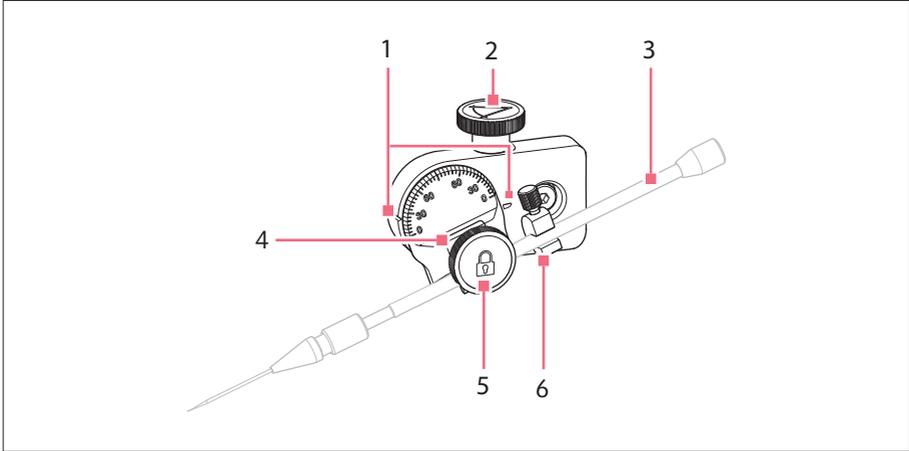


Fig. 4-7: Angle head with inserted capillary holder 4

- | | |
|--|--|
| <p>1 Identification
For setting the angle</p> <p>2 Knurled screw
For setting the injection angle</p> <p>3 Capillary holder 4
(not included in the delivery package)</p> | <p>4 Holder for capillary holder</p> <p>5 Fixing screw
For securing the capillary holder</p> <p>6 Positioning aid</p> |
|--|--|

4.3.8 Swivel joint

The swivel is supplied ready for right side mounting. For mounting on the left-hand side, the swivel joint must be modified.

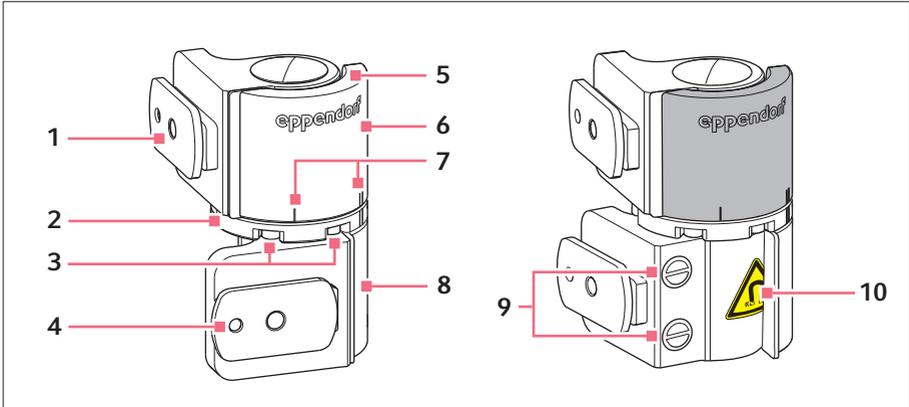


Fig. 4-8: Swivel joint for right side mounting of the motor module

- | | |
|---|--|
| <p>1 Slider
Y-module</p> <p>2 Turntable</p> <p>3 Allen screws</p> <p>4 Slider
X-module</p> <p>5 Stop plate</p> | <p>6 Upper joint</p> <p>7 Mounting mark
I stands for left side mounting
II stands for right side mounting</p> <p>8 Lower joint</p> <p>9 Industrial magnets</p> <p>10 Warning symbol
Strong magnetic field</p> |
|---|--|

4.4 Mounting the motor module

The motor module can be mounted on the right-hand or left-hand side of the microscope adapter. The following describes mounting on the right-hand side. For mounting on the left-hand side, the swivel joint and the angle head must be modified.

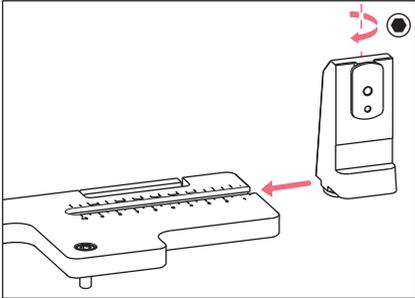


The motor module is mounted as standard on an inverse microscope. It can also be mounted on a universal stand. Mounting on a universal stand is described in the corresponding manual.

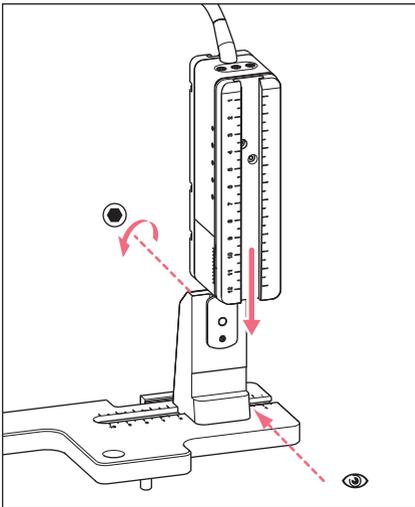
4.4.1 Mounting the Z-module – horizontal microscope adapter

Prerequisites

- Horizontally mounted microscope adapter
- Installation manual for the microscope adapter
- Allen torque screwdriver, 3 mm



1. Slide the Z-module holder onto the microscope adapter.

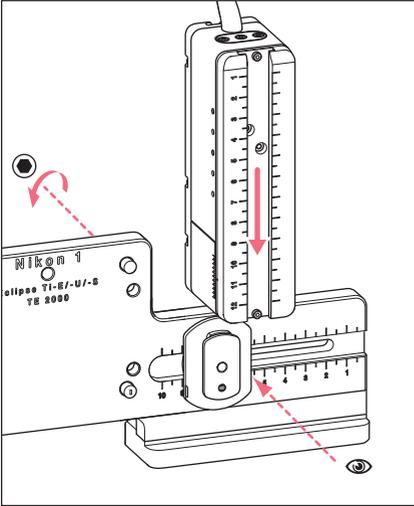


2. Push the fixed rail onto the Z-module holder until it reaches the stop angle and tighten the screw.
The connecting cable must point to the rear.
3. Take the setting position for the Z-module holder from table column **1** (installation manual for the microscope adapter).
4. Slide the Z-module holder with the Z-module into its setting position and tighten the screw.

4.4.2 Mounting the Z-module – vertical microscope adapter

Prerequisites

- Vertically mounted microscope adapter
- Installation manual for the microscope adapter
- Allen torque screwdriver, 3 mm

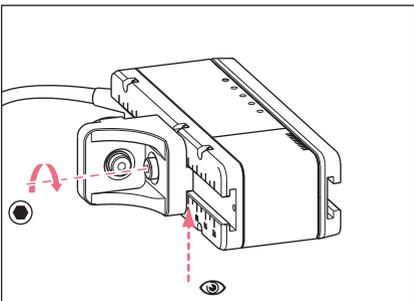


1. Slide the Z-module onto the Z-slider and tighten the screw slightly.
2. Take the setting position for the Z-module from table column 1 (installation manual for the microscope adapter).
3. Slide the Z-module into its setting position and tighten the screw.

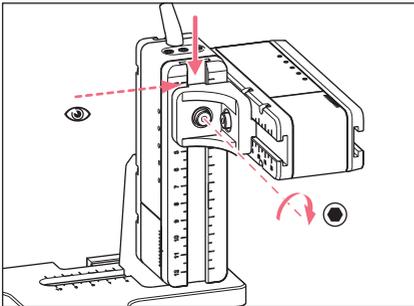
4.4.3 Mounting the Y-module

Prerequisites

- Installation manual for the microscope adapter
- Allen torque screwdriver, 3 mm



1. Undo the screw on the YZ connector.
2. Take the setting position from table column 3 (installation manual for the microscope adapter).
3. Set the position on the front edge of the YZ connector.
4. Tighten the screw on the YZ connector.



5. Take the setting position from table column **4** (installation manual for the microscope adapter).
6. Push the YZ connector with the Y-module onto the Z-module and hold it in position.
7. Set the position on the upper edge of the YZ connector.
8. Tighten the screw on the YZ connector.

4.4.4 Mounting the X-module

Prerequisites

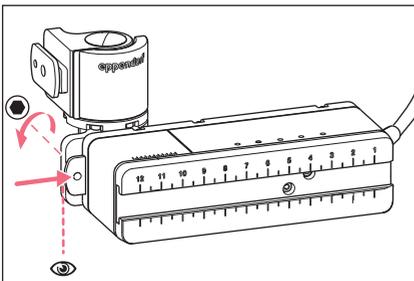
- Installation manual for the microscope adapter
- Allen torque screwdriver, 3 mm



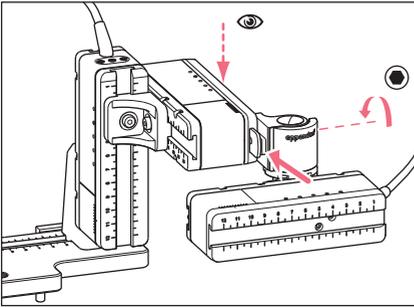
WARNING! Danger due to strong magnetic field

Magnetic fields may affect pacemakers and defibrillators. Pacemakers may be reset.

- ▶ Keep a distance of at least 10 cm from the magnet.
- ▶ In particular, be sure to keep the safety distance during installation.



1. Push the swivel joint onto the fixed rail of the X-module.
The **ependorf** labeling must be readable.
2. Take the setting position from table column **6** (installation manual for the microscope adapter).
3. Set the position on the left edge of the swivel joint.
4. Tighten the screw on the swivel joint.

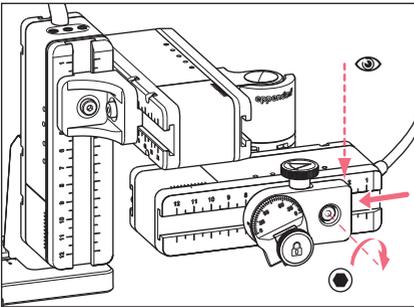


5. Take the setting position from table column **5** (installation manual for the microscope adapter).
6. Push the swivel joint with the X-module onto the Y-module.
7. Set the position on the rear edge of the swivel joint.
8. Tighten the screw on the swivel joint.

4.4.5 Mounting the angle head

Prerequisites

- Installation manual for the microscope adapter
- Allen torque screwdriver, 3 mm



1. Push the angle head onto the X-module.
2. Take the setting position from table column **7** (installation manual for the microscope adapter).
3. Set the position on the right edge of the angle head.
4. Tighten the screw on the angle head.

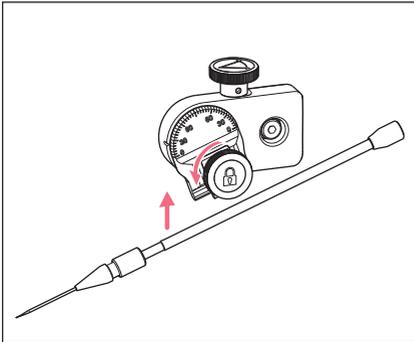
4.5 Inserting capillary holder 4 into the angle head

Prerequisites

- Fully assembled capillary holder 4 is prepared.



Capillary holder 4 is included in the delivery package of the CellTram 4m Air/Oil microinjector from Eppendorf.



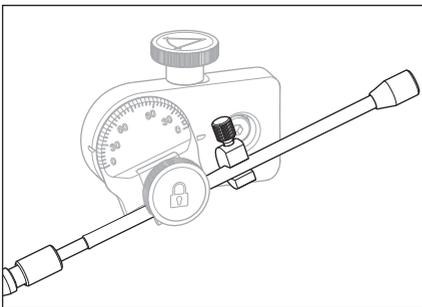
1. Loosen the fixing screw on the angle head.
2. Insert the capillary holder into the clamp.
3. Align the capillary holder in such a way that the capillary tip is located approx. 20 mm above and approx. 20 mm from the outside of the operating point.

4.5.1 Attaching the positioning aid

Prerequisites

- The positioning aid (included in the delivery package) is prepared.
- Capillary holder 4 is inserted in the angle head.

The positioning aid can be attached to the capillary holder to quickly clamp it in the same position.



1. Place the positioning aid on the capillary holder and tighten.
2. Tighten the fixing screw.

4.6 Inserting the capillary



WARNING! Risk of injury due to flying capillaries and glass splinters.

If exposed to high pressures, capillaries may detach themselves from the grip heads and become projectiles.

Capillaries can crack as a result of incorrect handling.

- ▶ Wear protective goggles.
 - ▶ Never aim capillaries at people.
 - ▶ Use capillaries with an outer diameter that matches the grip head specifications.
 - ▶ Always mount / dismount capillaries when they are depressurized.
 - ▶ Mount the capillary correctly in the grip head.
 - ▶ Do not touch the capillary with the Petri dish or other objects.
-



NOTICE! Mechanical damage to the motor modules.

Excessive load leads to increment errors or destruction of the drive.

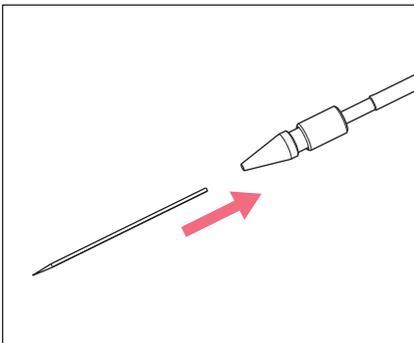
- ▶ Do not drive the modules against mechanical obstructions.
 - ▶ Do not hold any objects near the modules.
 - ▶ Load the motor module with a maximum of 200 g.
-



Standard capillary: Only use the grip head 4, size 0, with capillaries with an outer diameter of 1.0 mm to 1.1 mm. If you would like to use other capillaries, order the matching gear head.

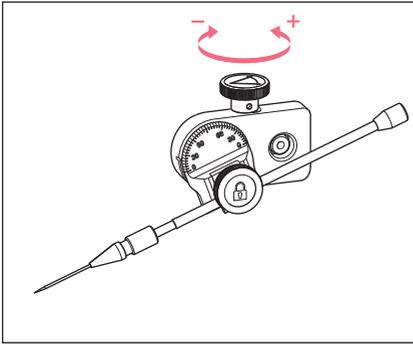
Prerequisites

- The O-rings are inserted in the grip head.



1. Push the capillary into the grip head until it reaches the stop and tighten the grip head.

4.7 Setting the injection angle



1. Turn the knurled screw to set the injection angle.
The injection angle normally corresponds to the angle of the capillary.

4.8 Aligning the motor module

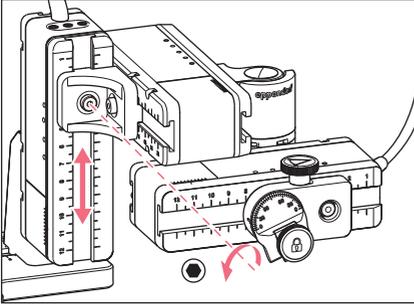
To be able to use the full movement range of the modules, the modules should be aligned centrally.

- i** The exact position values (vary depending on the angle adjustment) to adjust the modules to the microscope can be found in the installation instructions of the respective microscope adapter.

Position holder	Angle	1 [cm]	2 [cm]	3 [cm]	4 [cm]	5 [cm]	6 [cm]	7 [cm]
Down	10°	6.5	7.0	4.2	9.2	6.0	6.8	9.0
Top	25°	6.5	7.0	5.2	9.2	6.0	6.8	9.0
Top	35°	6.5	7.0	4.1	9.2	6.0	6.3	9.0
Top	45°	6.5	7.0	2.4	9.2	6.0	5.5	9.0

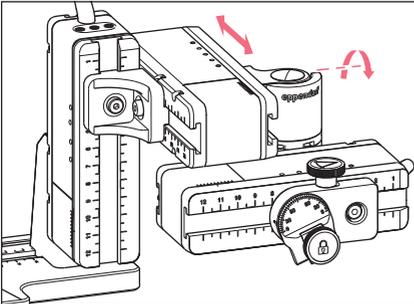
Fig. 4-9: Sample table from the installation manual for the Olympus 1 microscope adapter

4.8.1 Aligning the height



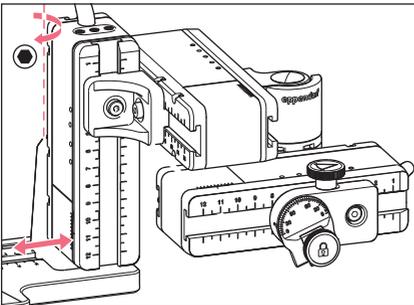
1. Undo the screw on the YZ connector.
2. Align the Y-module on the scale of the Z-module.
3. Tighten the screw to the set torque.

4.8.2 Aligning the depth



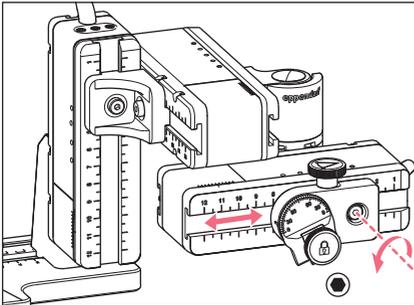
1. Undo the screw on the swivel joint.
2. Align the X-module on the scale of the Y-module.
3. Tighten the screw to the set torque.

4.8.3 Aligning the width



1. Undo the screw on the Z-module holder.
2. Align the Z-module on the scale of the microscope adapter.
3. Tighten the screw to the set torque.

4.8.4 Aligning the angle head



1. Undo the screw on the angle head.
2. Align the angle head on the scale of the X-module.
3. Tighten the screw to the set torque.

4.9 Entering mounting parameters

To facilitate easy remounting, the mounting parameters can be recorded.

- ▶ Enter the mounting parameters in the tables.

4.9.1 Microscope and adapter

Name	Type
Microscope	
Adapter	
Attachment side of the motor module	

4.9.2 Motor module – horizontal microscope adapter

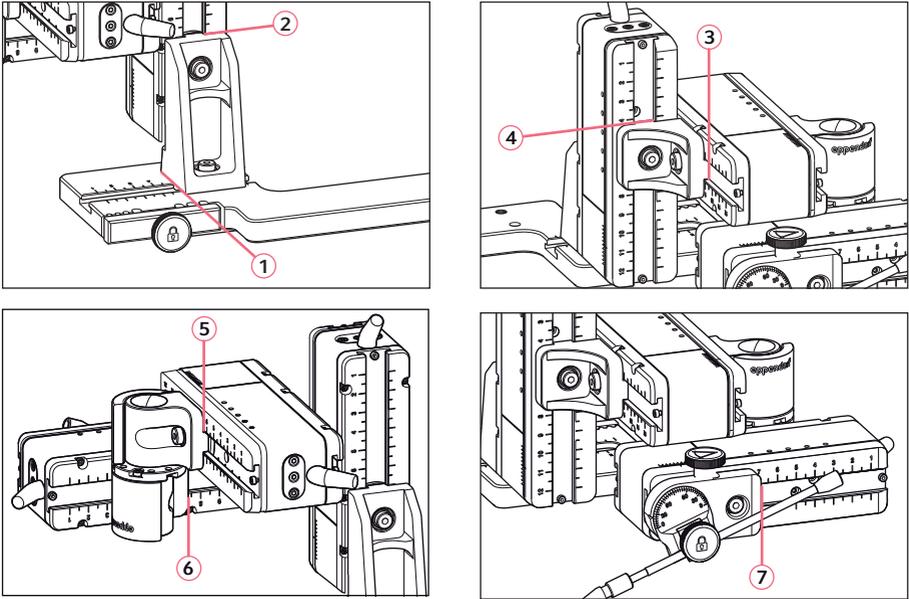


Fig. 4-10: Reading positions of the mounting parameters

4.9.3 Motor module – vertical microscope adapter

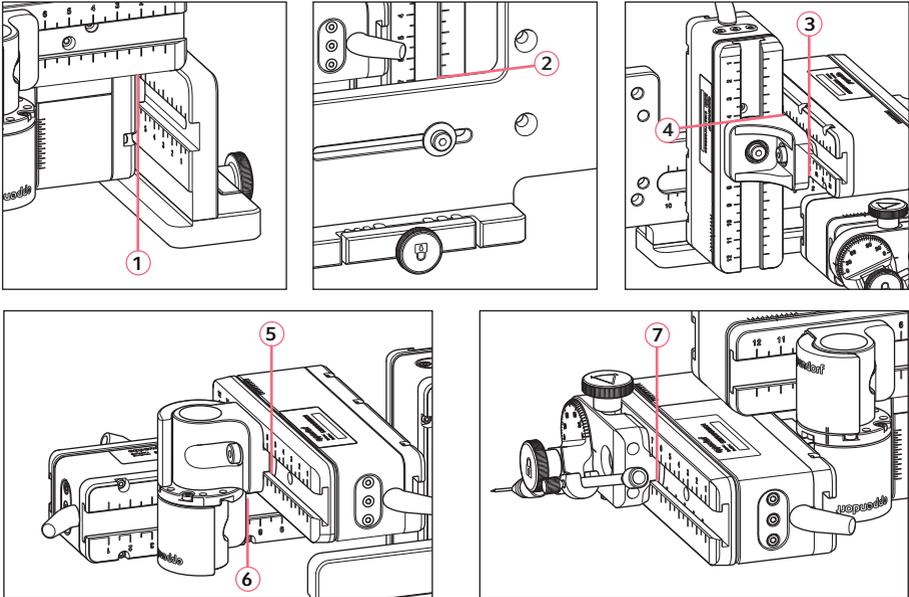


Fig. 4-11: Reading positions of the mounting parameters

Reading position	Position [cm]
1	
2	
3	
4	
5	
6	
7	

4.9.4 Angle head

Name	Position [cm]	Degrees
Capillary holder		
Injection angle		

4.10 Converting the swivel joint for left side mounting

Prerequisites

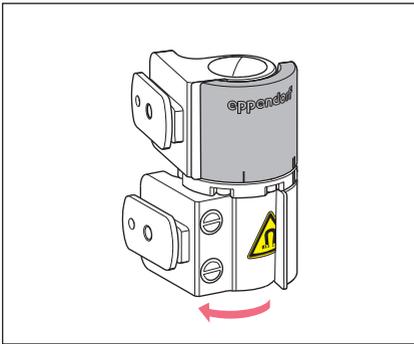
- 2 mm Allen key
- Right side mounting marks (II) are aligned above each other



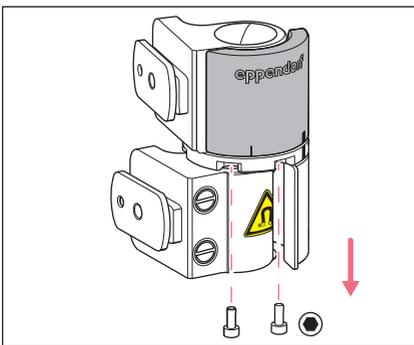
WARNING! Danger due to strong magnetic field

Magnetic fields may affect pacemakers and defibrillators. Pacemakers may be reset.

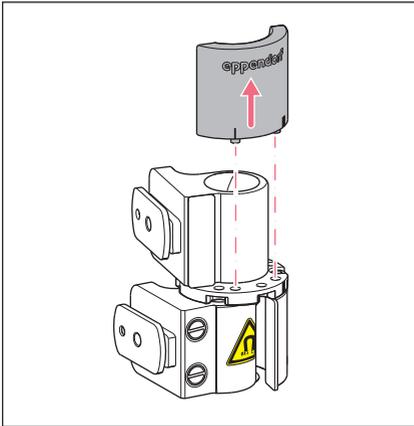
- ▶ Keep a distance of at least 10 cm from the magnet.
- ▶ In particular, be sure to keep the safety distance during installation.



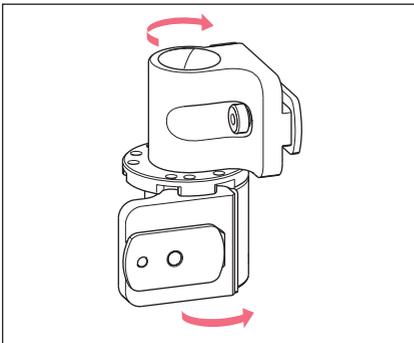
1. Rotate the lower joint until both Allen screws are accessible.



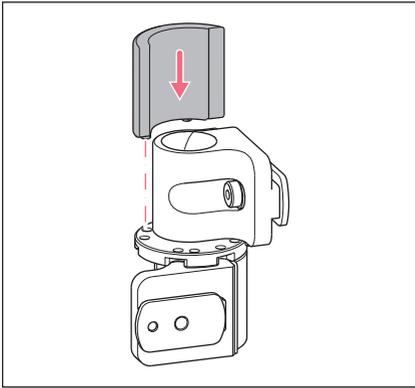
2. Unscrew the Allen screws.



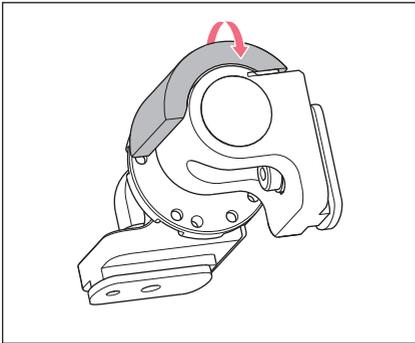
3. Open the upper joint a little bit.
The magnets are not in contact with the stop plate.
The stop plate can be removed more easily.
4. Remove the stop plate.



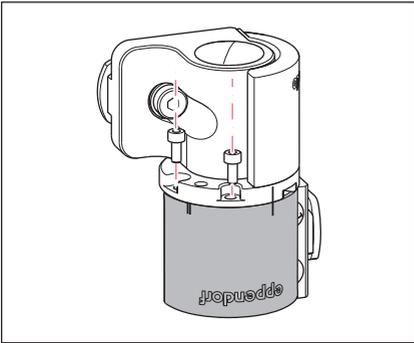
5. Rotate the lower joint back.
6. Rotate the upper joint by 180°.
The sliders must be at a 90° angle to each other.



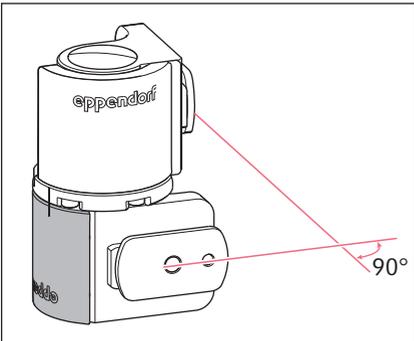
7. Align the left side mounting marks (I).
8. Fit the stop plate in such a way that the pins sit in the holes of the turntable.



9. Rotate the swivel joint by 180°.



10. Insert the Allen screws and tighten the stop plate.
Left side mounting marks (I) are aligned above each other.

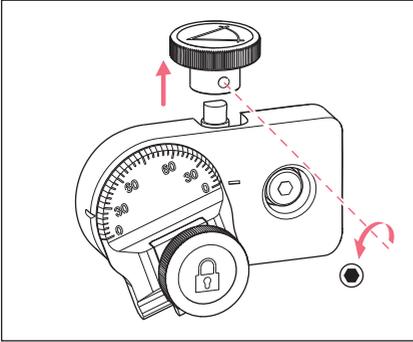


11. Check the position of the joints.
The sliders must be at a 90° angle to each other.
The ependorf labeling must be readable.

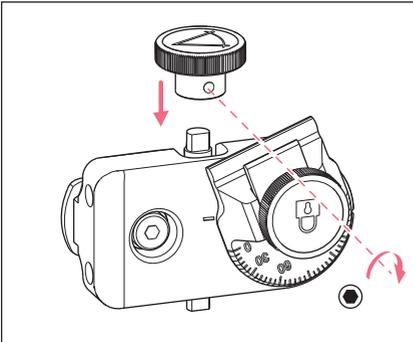
4.11 Converting the angle head for left side mounting

Prerequisites

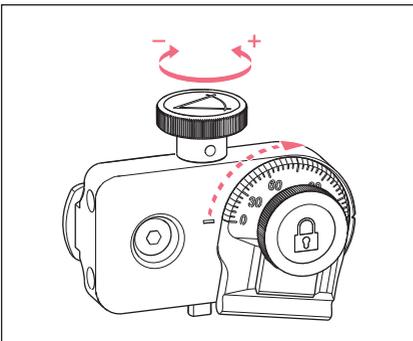
- 1.3 mm Allen key.



1. Undo the set screw and pull the knurled screw off the spindle.



2. Rotate the angle head by 180°.
3. Push the knurled screw onto the spindle end and fasten it with the set screw.



4. Turn the knurled screw until the desired angle is set.

4.12 Connect the motor module to the control board



WARNING! Danger due to incorrect voltage supply.

- ▶ Only connect the device to voltage sources which correspond with the electrical requirements on the name plate.
- ▶ Only use earth/grounded sockets with a protective earth (PE) conductor.
- ▶ Only use the mains/power cord supplied.



NOTICE! Damage to the control board as a result of incorrect handling.

- ▶ Grasp the control board on the housing.
- ▶ Do not lift the control board using the joystick.
- ▶ Never place the control board on the joystick.



NOTICE! Material damage due to incorrect connections.

- ▶ Only make electrical connections to devices that are described in the operating manual.
- ▶ Other connections are only permitted the consent of Eppendorf SE.
- ▶ Only connect devices that meet the safety requirements defined in IEC 62368-1.



NOTICE! Short circuit caused by incorrect installation.

- ▶ Failure to observe the order of steps may result in a short circuit.

Prerequisites

- TransferMan 4m is switched off.
 - The power cable is disconnected.
1. Connect the module (X,Y,Z) plug with the ports on the control board.
 2. Tighten the fixing screws on the plug manually.
 3. Connect the mains/power cord.
 4. Switch on the mains switch.
 5. Set the installation parameters. You can use the software wizard *First set-up* or the *Installation* menu to set the *Side* and *Angle* parameters.

4.13 Setting installation parameters

Installation parameters must be set:

- During first set-up
- After a reset

The following settings are defined:

- Mounting side of the motor module
- Center motors
- Adjust motors
- Set date
- Dynamic movement range of the joystick

4.13.1 First set-up wizard

Prerequisites

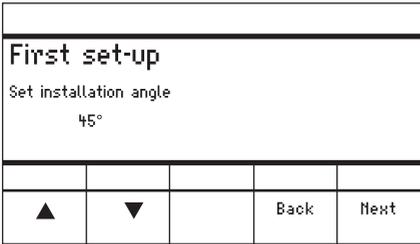
- The micromanipulator is switched on.
- The capillary holder is **not** installed.

Choose Your Application				
For permanent storage, press the soft key for 3 seconds (Changeable in Menu)				
Cell transf.	ICSI	DNA inject.	Basic	First setup

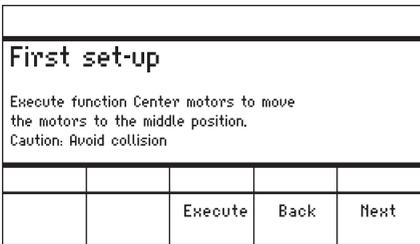
1. Select the *First set-up* application.

First set-up				
Installation side: left / right				
<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Left.	Right			Next

2. Select the mounting side.
3. Select *Next*.



4. Select *Next*.

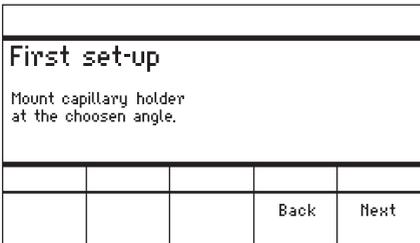


5. Select *Execute*.

The X-motor and the Y-motor are moved to the middle position.

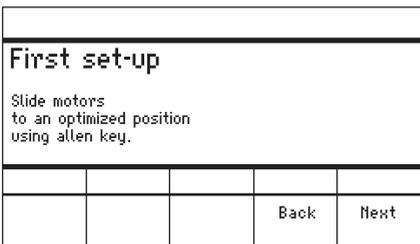
The Z-motor is set to a 20/80 position.

6. Select *Next*.



7. Insert the capillary holder into the angle head.

8. Select *Next*.



9. Align the modules manually with an Allen key.

10. Select *Next*.

First set-up				
Mount capillary and adjust position of capillary holder if necessary.				
			Back	Next

First set-up				
Set time /date				
			Back	Next
▲	▼	▶		

First set-up				
Dyn.-mode ON / OFF				
<input checked="" type="checkbox"/>	<input type="checkbox"/>		Back	Next
ON	OFF			

First set-up				
Installation is done, press ENTER				
			Back	
		Enter		

11. Remove the capillary holder.
12. Insert the capillary into the capillary holder.
13. Insert the capillary holder with the capillary into the angle head.
14. Finely adjust the position of the capillary holder and the modules.
Align the capillary tip so that it is approximately in the focus of the microscope.
15. Select *Next*.

16. Set the time and the date.
17. Select *Next*.

18. Switch the dynamic movement range of the joystick on or off.
19. Select *Next*.

20. Select *Enter*.
The installation is complete and the modules are adjusted.
The application screen shows *My application*.
You can select an application or define it as the start screen.

5 Software

5.1 Display

The display shows current settings, e.g., the selected working range, the position of the motors and the defined limits.

5.1.1 Application display

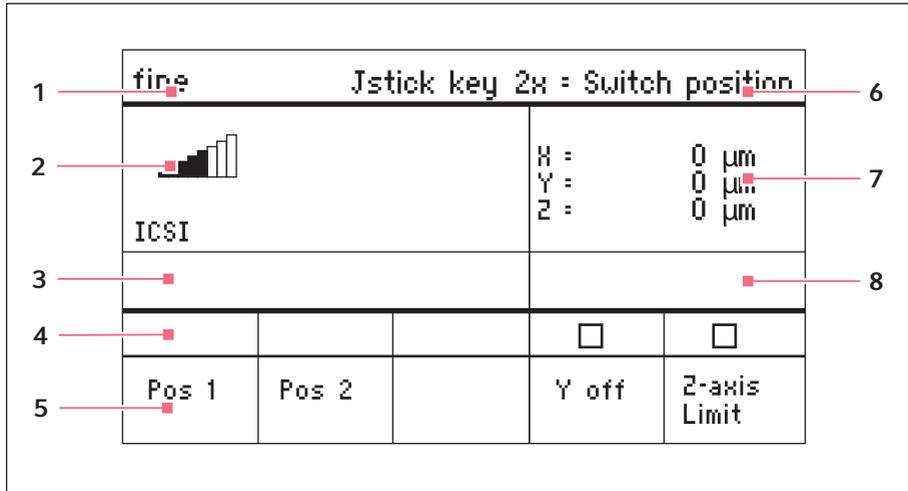


Fig. 5-1: Display layout - ICSI application example

- | | |
|--------------------------------------|--------------------------------|
| 1 Status line with working range | 5 Softkeys |
| 2 Active application with speed bars | 6 Function of the joystick key |
| 3 Connected device | 7 Display of coordinates |
| 4 Softkey status fields | 8 Display of defined limits |

5.1.2 Display of coordinates

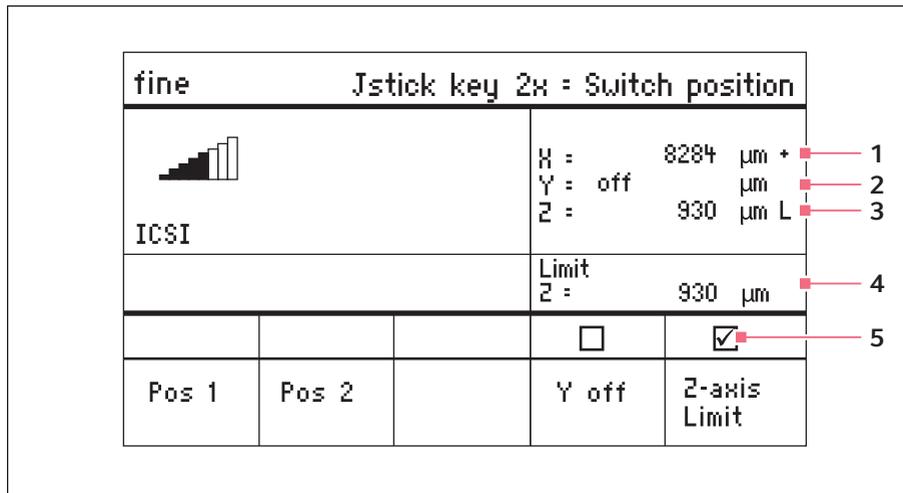


Fig. 5-2: Display of coordinates

- 1 **Motor limit stop**
 + = positive, - = negative
- 2 **Axis is switched off**
- 3 **Lower limit (Z-axis Limit) reached**
- 4 **Display of lower limit**
- 5 **Downward limit is switched on**

5.1.3 Menu display

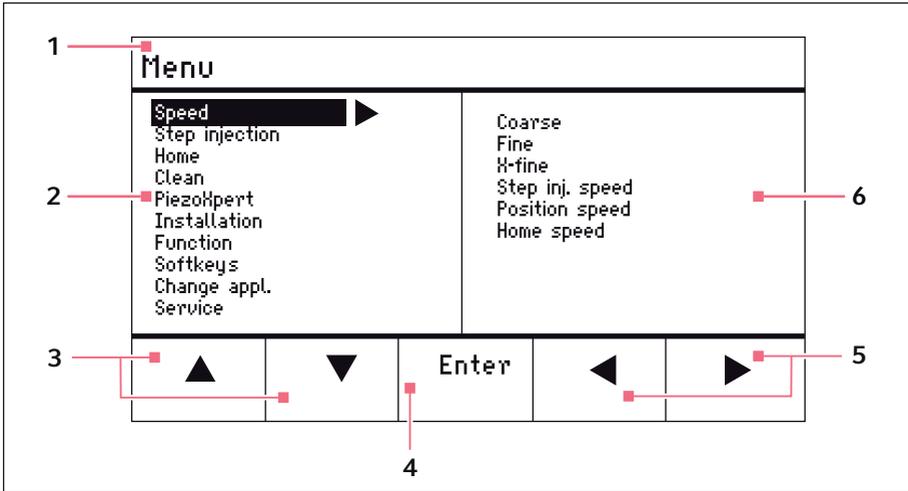


Fig. 5-3: Menu and parameter display

- | | |
|---|---|
| <p>1 Navigation path</p> <p>2 Menu</p> <p>3 Arrow up/down softkey
 Navigation and changing parameters.</p> | <p>4 Enter softkey
 For confirming input, executing the function, saving parameters</p> <p>5 Arrow left/right softkey
 Navigation</p> <p>6 Parameter</p> |
|---|---|

5.2 Applications



Fig. 5-4: Application screen

Application selection

- Select the *ICSI* application
- Store the main application



The *Cell transfer*, *DNA injection* and *Basic* applications are not approved for medical use.

5.2.1 Application parameters

Predefined softkeys of the *ICSI* application.

Application parameters	Description
<i>Pos 1</i>	Save the X, Y and Z values of the capillary position. Switch the position using the joystick key.
<i>Pos 2</i>	Save the X, Y and Z values of the capillary position. Switch the position using the joystick key.
<i>Y off</i>	Switch off the movement of the capillary in the Y-axis. Prevents moving sideways during injection.
<i>Z-axis Limit</i>	Set the lower limit for vertical capillary movement.
<i>Axial</i>	The use of this function is not permitted for medical applications.

5.2.2 Application – ICSI

fine Jstick key 2x = Switch position				
 ICSI		H : ----- μm H Y : ----- μm H Z : ----- μm H		
		<input type="checkbox"/> <input type="checkbox"/>		
Pos 1	Pos 2			
		Y off	Z-axis Limit	

Fig. 5-5: Application 2 ICSI

Parameter selection

- Double-click on joystick key – switch position
- Save positions 1 and 2
- Freely program the softkey
- Deactivate the control of the movement axis (Y-axis)
- Set the lower limit (Z-axis Limit)

5.3 Main menu

Menu				
Speed ▶ Step injection Home Clean PiezoXpert Installation Function Softkeys Change appl. Service		Coarse Fine H-fine Step inj. speed Position speed Home speed		
▲	▼	Enter	◀	▶

Fig. 5-6: Main menu

Menu	Parameter
<i>Speed</i>	Set the working range and the speed parameters
<i>Step injection</i>	This function is not approved for medical applications
<i>Home</i>	Set the parameters for the Home movement
<i>Clean</i>	Set the parameters for the Clean movement
<i>PiezoXpert</i>	This function is not approved for medical applications
<i>Installation</i>	Set the device parameters
<i>Function</i>	Execute the device function
<i>Softkeys</i>	Program the softkeys
<i>Change appl</i>	Change the selected application or activate the application screen
<i>Service</i>	Execute the service function on a user basis

5.4 Navigating in the menu

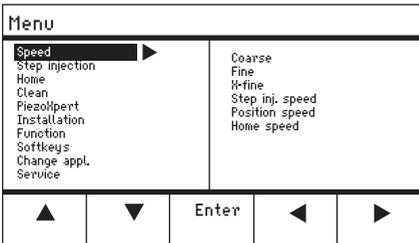


Fig. 5-7: Software navigation

Use the arrow keys to navigate in the menu. Press *Enter* to confirm a selection. Use the left or right arrow keys to change between the menus and submenus.

5.4.1 Entering or changing the parameters

Parameters can be changed in the menu using the arrow keys, the selection dial or the rotating wheel on the joystick.

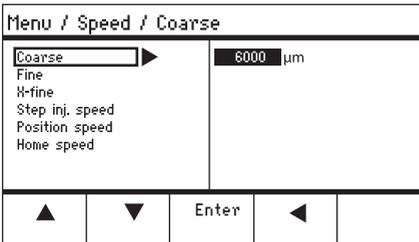


Fig. 5-8: Changing parameters

- ▶ Change values using the up and down arrow keys.
- ▶ Change values using the selection dial.
- ▶ Change values using the upper part of the joystick.
- ▶ Save with *Enter*.

6 Operation



WARNING! Electric shock due to damage to the device or mains/power cord.

- ▶ Only switch on the device if the device and the mains/power cord are undamaged.
- ▶ Only operate devices which have been installed or repaired properly.
- ▶ In case of danger, disconnect the device from the mains/power supply voltage. Disconnect the mains/power plug from the device or the earth/grounded socket. Use the disconnecting device intended for this purpose (e.g., the emergency switch in the laboratory).



Do not move the joystick immediately after power-on. Wait until the initialization is completed. The completion of initialization is indicated by the display switching to the operating state.

6.1 Switching the device on or off

6.1.1 Switching the device on

1. Switch on the device at the mains/power switch.
The motor module and the control board are switched on.
The device runs through an initialization phase.
The application screen appears.

6.1.2 Switching off the device

1. Switch off the device at the mains/power switch.
The motor module and the control board are deenergized.

6.2 Activating or deactivating the control board

6.2.1 Activating the control board

Prerequisites

- The display shows *STANDBY*.
1. Press the *standby* key.
The keys, joystick, selection dial, and softkeys are activated.
The display shows the application screen.

6.2.2 Deactivating the control board

The step motors slowly move to the next parking position. This prevents the motors falling back to the parking position and the capillary jumping.

1. Press the *standby* key.
The keys, joystick, and selection dial are deactivated.
The display shows *STANDBY*.
Current movements are stopped.
The motor module remains switched on so that the step motors keep their current position.

6.3 Defining the start screen

The *ICSI* application can be selected as the default application. The micromanipulator then starts with the defined application. The application screen with all the applications can be redefined in the *Start display* menu.

6.3.1 Defining the application

1. Press and hold the *ICSI* softkey for 3 seconds.
The micromanipulator always starts with the defined application.

6.3.2 Defining the selected application

1. In the *Change appl* menu, select the *Start display* submenu.
2. Select *Execute*.
3. Confirm with *Enter*.
The micromanipulator starts with the selected application.

6.4 Replacing the capillary

Prerequisites

- The capillary is depressurized.



WARNING! Risk of injury due to flying capillaries and glass splinters.

If exposed to high pressures, capillaries may detach themselves from the grip heads and become projectiles. Capillaries can crack as a result of incorrect handling.

- ▶ Wear protective goggles.
- ▶ Never aim capillaries at people.
- ▶ Use capillaries with an outer diameter that matches the grip head specifications.
- ▶ Always mount / dismount capillaries when they are depressurized.
- ▶ Mount the capillary correctly in the grip head.
- ▶ Do not touch the capillary with the Petri dish or other objects.



CAUTION! Risk of injury from capillaries

Capillaries can easily penetrate your skin.

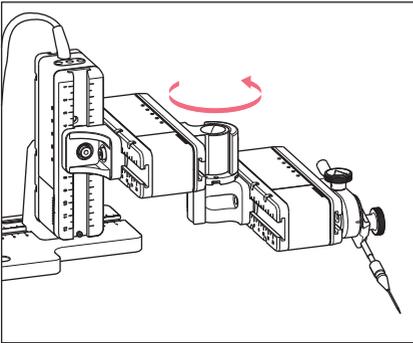
- ▶ After changing a capillary, swivel it immediately back to the working range.



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

- ▶ Do not reach into the movement range of the modules.
-



1. Move the capillary out of the working range using the *home* key.
2. Swing the X-module forwards.
3. Undo the grip head on the capillary holder.
4. Carefully pull the capillary out of the grip head.
5. Push the new capillary into the grip head until it reaches the stop and tighten the grip head.
6. Swing the X-module back.

6.4.1 Manually positioning the capillary

i Suitable when using capillaries of different lengths.

1. Press the *Back manual* key.
2. Manually position the capillary in the working range.

6.4.2 Automatically positioning the capillary

i Suitable for capillaries of exactly the same length.

1. Press the *home* key.
The capillary automatically moves back into the working range.

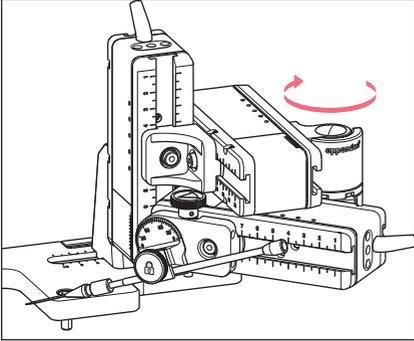
6.5 Replacing the sample on the microscope table



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

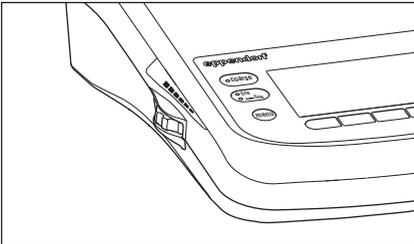
- ▶ Do not reach into the movement range of the modules.



1. Press the *home* key to move the capillary out of the working range.
2. Swing the X-module backwards.
3. Replace the sample.
4. Swing the X-module back.
5. Press the *home* key to move the capillary back into the working range.

6.6 Changing the size of the working range

6.6.1 Changing parameters using the selection dial



1. Press the key for the required working range on the control panel.
2. Turn the selection dial to change the value of the working range.

6.6.2 Changing parameters in the menu

Prerequisites

- The *ICSI* application is selected.

Menu / Speed	
Coarse	8000 μm
Fine	250 μm
X-fine	0 μm
Step inj. speed	300 $\mu\text{m}/\text{s}$
Position speed	1500 $\mu\text{m}/\text{s}$
Home speed	7500 $\mu\text{m}/\text{s}$

▲ ▼ Enter ◀ ▶

1. Press the *menu* key.
2. Select the *Speed* menu.
3. Select the required parameter.
4. Change the value.

6.7 Shifting the movement range of the capillary

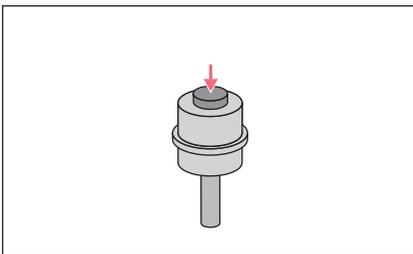
6.7.1 Extending the movement range into the dynamic range

When the movement range of the capillary is not sufficient, the joystick can be moved into the dynamic range. By doing that you can move the capillary further into the required direction.

1. Move the joystick into the dynamic range.
2. Keep the joystick in the dynamic range until the capillary has reached the desired position.
The further you move the joystick forwards or backwards, the faster the capillary will move.

6.7.2 Uncoupling and resetting the joystick

When the current movement range of the capillary is not in the correct position, the joystick movement can be uncoupled from the capillary movement. By doing that you can reset the joystick and move the capillary further into the required direction.



1. Hold the joystick button.
2. Move the joystick in the opposite direction.
3. Release the joystick.
The capillary can now be moved further into the required direction.

6.8 Capillary positions

To secure the capillary when moving a slide and to move it back again to the same work position, you can save the coordinates. Strictly speaking, the system does not save the position of the capillary tip, but the coordinates of the motor module. The standard function saves the coordinates for the duration of the working session. When the micromanipulator is switched off, the saved data, positions and coordinates will be deleted. If the saved data is to be kept beyond the duration of the working session, the extended storage function can be used.

Storage functions:

- Standard storage function – the coordinates are deleted when the device is switched off.
- Extended storage function – the coordinates are kept when the device is switched off.

6.8.1 Saving a position

Prerequisites

- The *ICSI* application is selected.

fine		Jstick key 2x = Switch position		
		X = -229 µm Y = 44 µm Z = -985 µm		
ICSI				
<input checked="" type="radio"/>			<input type="checkbox"/>	<input type="checkbox"/>
Pos 1	Pos 2		Y off	Z-axis Limit

1. Move the capillary to the desired position.
2. Hold the *Pos 1* softkey for approx. one second to store the working position of the capillary.

An acoustic signal sounds.

Pos 1 is marked.

The coordinates are displayed.

The stored position is displayed in the status field.

fine		Jstick key 2x = Switch position		
		X = 1405 µm Y = -125 µm Z = 601 µm		
ICSI				
<input type="radio"/>	<input checked="" type="radio"/>		<input type="checkbox"/>	<input type="checkbox"/>
Pos 1	Pos 2		Y off	Z-axis Limit

3. Move the capillary to the desired position (e.g., parking position).
4. Press and hold the *Pos 2* softkey for approx. one second to store the parking position of the capillary.

An acoustic signal sounds.

Pos 2 is marked.

The stored position is displayed in the status field.



As soon as the capillary leaves a stored position, the filled circle is displayed as an empty circle to show that this position is now stored. If no positions are stored, the status field will be empty.

6.8.2 Moving to the position using the softkey

Prerequisites

- At least one position is stored.
1. Press a softkey with a stored position.
 You will move to the selected position.
 The joystick is deactivated until the position has been reached.
 The LEDs flash.
 In the softkey status field a filled circle is displayed.



If a stored position is lower than the lower limit (*Z-axis Limit*), the position on the Z-axis will only be approached up to the defined limit.

6.8.3 Moving to the position using the joystick key

Prerequisites

- At least one position is stored.
 - The *Joystick key* parameter must be set to the *Switch position* value.
- ▶ Press the joystick key twice.
 You will move to the first position.
 - ▶ Press the joystick key twice.
 You will move to the next position.

6.8.4 Overwriting a stored position

Prerequisites

- A position is stored.
1. Press the softkey for a different position.
 You will move to the position.
 2. When the position has been reached, press and hold the softkey for the position to be overwritten.
 The old position is overwritten with the current coordinates.
 3. Press the softkey.
 An acoustic signal sounds.
 In the softkey status field a filled circle is displayed.
 The stored position is displayed in the coordinate field.

6.8.5 Deleting a stored position

Prerequisites

- A position is stored.
1. When the position has been reached, hold the softkey.
An acoustic signal sounds.
The position has been deleted.
The status field is empty.

6.9 Using the advanced storage function

The following data is stored:

- the current coordinates of the motor module.
- the data of the *Pos 1* to *Pos 5* softkeys.
- the defined vertical (*Z-axis Limit* and *Upper limit*) or horizontal (*X-axis Limit*) limits.

Prerequisites

- The *ICSI* application has been defined as the default application.
 - At least one position or limit has been defined.
1. Press the *standby* key.
The specified data of the work session will be stored.
The current coordinates of the motor module will be stored.
For technical reasons, the motors will still move a few micrometers after this to get into a defined end position.
The micromanipulator can be switched off at the mains/power switch.
The data will be available when the micromanipulator is started the next time.

6.10 Vertical limits

For the Z-axis, a lower and upper limit can be defined. This prevents the capillary coming into contact with the bottom of the Petri dish or moving against the condenser of the microscope adapter.

- Lower limit – *Z-axis Limit*
- Upper limit – *Upper limit*

6.10.1 Defining the lower limit

Prerequisites

- An application has been selected.

fine		Jstick key 2x = Switch position	
		H :	0 μm
ICSI		Y :	0 μm
		Z :	930 μm L
		Limit Z :	930 μm
		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pos 1	Pos 2	Y off	Z-axis Limit

1. Position the capillary a little way above the slide.
2. Press *Z-axis Limit*.
The Z-coordinate is marked with L. The value for the limit (*Limit Z*) is displayed.
Z-axis Limit is selected.
The capillary cannot be moved any lower.

6.10.2 Deleting the lower limit

1. Press *Z-axis Limit*.
The limit is deleted.

6.10.3 Defining the upper limit

Menu / Installation / Upper Limit			
Upper Limit		H :	0 μm
		Y :	0 μm
		Z :	2671 μm U
		Lim	2671 μm
	Clear	Set	Back

1. In the *Installation* menu, select the *Upper limit* submenu.
The *Upper Limit* window appears.
2. Move the capillary to the top position.
3. Save the position with *Set*.
The Z-coordinate is marked with U. The value for the limit (*Lim*) is displayed.
The capillary cannot be moved any higher.

6.10.4 Deleting the upper limit

1. In the *Installation* menu, select the *Upper limit* submenu.
The *Upper Limit* window appears.
2. Save the position with *Clear*.
The limit is deleted.

6.11 Horizontal limit

For the X-axis, a limit can be defined for a horizontal injection. This prevents the capillary from moving through the sample.

fine		Jstick key 2x = Switch position	
		H :	-96 µm L
ICSI		Y :	0 µm
		Z :	0 µm
		Limit	
		H :	-96 µm
		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pos 1	Pos 2	Y off	X-axis Limit

6.11.1 Defining the horizontal limit

1. In the *Installation* menu, select the *Angle* submenu.
2. Set the injection angle to 0° and save with *Enter*.
3. Close the menu.
The application screen now displays *X-axis Limit*.
4. Move the capillary to the desired final position for the X-axis.
5. Save the lateral limit with *X-axis Limit*.
The X-coordinate is marked with *L*.
The value for the limit (*Limit X*) is displayed.
X-axis Limit is selected.
The capillary cannot be moved any further to the side.

6.11.2 Deleting the horizontal limit

1. Press *X-axis Limit*.
The limit is deactivated.
2. In the *Installation* menu, select the *Angle* submenu.
3. Reset the injection angle to the operating angle and save with *Enter*.
The lateral limit is deleted.
The application screen displays *Back* again.

6.12 Speed function

In the *Speed* menu you can set the size of the working range and the speed at which certain positions are approached or movements executed.

6.12.1 Speed menu and parameters

Menu / Speed	
Coarse	6000 μm
Fine	250 μm
X-fine	0 μm
Step inj. speed	300 $\mu\text{m/s}$
Position speed	1500 $\mu\text{m/s}$
Home speed	7500 $\mu\text{m/s}$

▲ ▼ Enter ◀ ▶

Fig. 6-1: Menu – Speed

Parameter	Value	Range of values	Increment	Standard
Coarse	Set size in μm	5 – 12500	5	6000
Fine	Set size in μm	5 – 2000	5	250
X-fine	Set size in μm	0 – 600	1	80
Step inj. speed	Set speed in μm per second	5 – 10000	5	300
Position speed	Set speed in μm per second	5 – 10000	5	1500
Home speed	Set speed in μm per second	5 – 10000	5	7500

6.12.2 Setting the parameter for Speed

i If a value of 0 is set for the parameter *X-fine*, then the option of changing between the *Fine* and *X-fine* working ranges is deactivated.

1. Select the desired parameter.
2. Set the value for the parameter.
3. Close the menu.

6.13 Step injection function

i The use of this function is not approved for medical applications.

6.14 Home function

The *Home* function quickly moves the capillary out of the work area and is suitable for a quick change of capillary.

6.14.1 Home menu and parameters

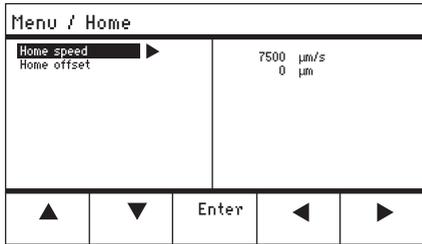


Fig. 6-2: Menu – *Home*

Parameter	Value	Range of values	Increment	Standard
<i>Home speed</i>	Set the speed of the Home function in $\mu\text{m/s}$	5 – 10000	5	7500
<i>Home offset</i>	Set vertical offset in μm	5 – 20000	5	0

6.14.2 Setting the parameter for *Home*

1. Set the speed.
2. Set the offset.
3. Close the menu.

6.14.3 Move the capillary out with the *home* key

Prerequisites

- The parameters in the *Home* menu have been defined.



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

- ▶ Do not reach into the movement range of the modules.

coarse				
HOME To move back use HOME optional press Back manual		H : 0 μm Y : 0 μm Z : 0 μm		
Offset = 0 μm				
▲	▼	Back manual		

1. Press the *home* key.
The *home* key flashes.
The capillary is moved out of the work area.
The *home* key lights up.

6.14.4 Move the capillary back with the *home* key



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

- ▶ Do not reach into the movement range of the modules.

1. Press the *home* key.
The *home* function is terminated.
The capillary is moved back into the work area.

6.14.5 Setting the offset.

For capillaries of different lengths, an offset can be set. This defines a limit for the *home* function.

coarse				
HOME To move back use HOME optional press Back manual		H : 0 μm Y : 0 μm Z : 0 μm		
Offset = 0 μm				
▲	▼	Back manual		

1. Change the offset using the arrow keys.
The value for the offset is displayed in the status field.

6.14.6 Terminate the *home* function.

COARSE				
HOME To move back use HOME optional press Back manual		H :	0	µm
		Y :	0	µm
		Z :	0	µm
Offset = 0 µm				
▲	▼	Back manual		

1. Press *Back manual*.
The *home* function is terminated.
2. Move the capillary manually using the joystick.

6.15 Clean function

With this function you can move the capillary over a defined distance out of the medium. In the process, outside contamination is removed from the capillary at the medium boundary.

6.15.1 Clean menu and parameters

Menu / Clean				
Home speed ▶		7500 µm/s		
Clean distance		10000 µm		
▲	▼	Enter	◀	▶

Fig. 6-3: Menu – Clean

Parameter	Value	Range of values	Increment	Standard
<i>Home speed</i>	Set the speed of the Clean function in µm/s	5 – 10000	5	7500
<i>Clean distance</i>	Set distance in µm	0 – 20000	5	10000

6.15.2 Setting the parameter for *Clean*

i Set the *Clean distance* above the medium boundary

1. Set *Home speed*.
2. Set *Clean distance*.
3. Close the menu.

6.15.3 Execute the *Clean* function

Prerequisites

- Parameters are set for *Clean*.
- Clean* is assigned to a softkey.

coarse				
CLEAN		H :	-3923	µm
To move back use CLEAN		Y :	2135	µm
optional press		Z :	4527	µm
Back manual				
		Back		Clean
		manual		

- Press *Clean*.
The screen for *Clean* appears.
- Execute the function with *Clean*.
The capillary is moved out of the medium with the set parameters.

6.15.4 Terminate the *Clean* function.

coarse				
CLEAN		H :	-3923	µm
To move back use CLEAN		Y :	2135	µm
optional press		Z :	4527	µm
Back manual				
		Back		Clean
		manual		

- Press *Back manual*.
The function is terminated.
The application screen appears.

6.16 PiezoXpert function

 The use of this function is not permitted for medical applications.

6.17 Installation function

This function provides settings for the fine adjustment of the motor module and the control board. Parameters in the *Installation* menu override identical softkey functions.

6.17.1 Installation menu and parameters

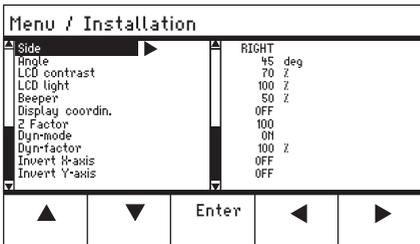


Fig. 6-4: *Installation* menu

6.17.2 Installation parameters

Parameter	Value	Range of values	Increment	Standard
<i>Side</i>	Set the mounting side	LEFT/RIGHT	–	RIGHT
<i>Angle</i>	Set the capillary angle in degrees	0° – 90°	1	–

6.17.3 Control board parameters

Parameter	Value	Range of values	Increment	Standard
<i>LCD contrast</i>	Set the display contrast	65 % – 75 %	1	70 %
<i>LCD light</i>	Set the brightness level of the display	0 % – 100 %	1	100 %
<i>Beeper</i>	Setting the volume	0 – 100 %	1	50 %
<i>Display coordin</i>	Set the coordinate display	OFF/ON	–	ON

6.17.4 Joystick parameters

Parameter	Value	Range of values	Increment	Standard
<i>Z Factor</i>	Acceleration factor for the Z-axis relative to the X and Y-axis	5 % – 400 %	5	100
<i>Dyn-mode</i>	Switch the dynamic movement range on or off	OFF/ON	–	ON
<i>Dyn-factor</i>	Set the dynamic factor	0 % – 1000 %	1	100 %

6.17.5 Module parameters

Parameter	Value	Range of values	Increment	Standard
<i>Invert X-axis</i>	Reverse the direction of movement of the motor	OFF/ON	–	OFF
<i>Invert Y-axis</i>	Reverse the direction of movement of the motor	OFF/ON	–	OFF
<i>Invert Z-axis</i>	Reverse the direction of movement of the motor	OFF/ON	–	OFF
<i>X-axis off</i>	Switch the motor of the movement axis on or off	OFF/ON	–	OFF
<i>Y-axis off</i>	Switch the motor of the movement axis on or off	OFF/ON	–	OFF
<i>Z-axis off</i>	Switch the motor of the movement axis on or off	OFF/ON	–	OFF
<i>Upper limit</i>	Define the upper limit	Execute	–	–

6.18 Function function

Function allows you to reset the parameters and coordinates and to move the modules to the middle position.

6.18.1 Function menu and parameters

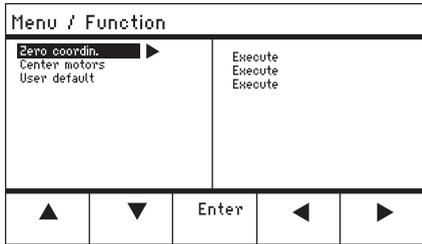


Fig. 6-5: Menu – *Function*

Parameter	Value	Range of values
<i>Zero coordin</i>	Reset all coordinates to zero	Execute
<i>Center motors</i>	Move step motors of the motor module to the middle position	Execute
<i>User default</i>	Reset the settings to the delivery status	Execute

6.18.2 Executing *Zero coordin*

1. Select the parameters and confirm with *Enter*.
2. Confirm *Execute* with *Enter*.
 All coordinates are reset to zero.
 Saved positions are deleted.
 Set limits are deleted.

6.18.3 Executing *Center motors*

Prerequisites

- No capillary holder is clamped.



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

- ▶ Do not reach into the movement range of the modules.
-

1. Select the parameters and confirm with *Enter*.
2. Confirm *Execute* with *Enter*.
X-motor and Y-motor are moved to the middle position.
Z-motor is moved to a 20/80 position.
All coordinates are reset to zero.
Saved positions are deleted.
Set limits are deleted.

6.18.4 Executing *User default*

1. Select the parameters and confirm with *Enter*.
2. Confirm *Execute* with *Enter*.
All parameters are reset to the factory settings.
The application screen appears.

6.19 *Softkeys* function

With this function you can assign programs to free softkeys. Assigned softkeys are indicated by a lock symbol.

6.19.1 Softkeys menu and parameters

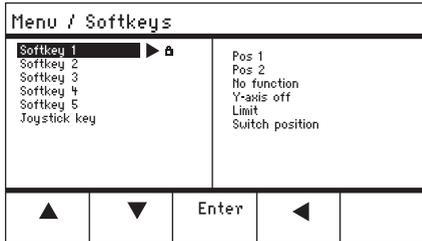


Fig. 6-6: *Softkeys* menu

Parameter	Value	Range of values
<i>Softkey 1</i>	Set the function	
<i>Softkey 2</i>	Set the function	
<i>Softkey 3</i>	Set the function	
<i>Softkey 4</i>	Set the function	
<i>Softkey 5</i>	Set the function	
<i>Joystick key</i>	Set the function for joystick key	<i>No function</i> <i>Switch position</i> <i>Switch fine</i>

Parameter	Function
<i>No function</i>	Softkey has no function
<i>Pos 1</i>	Save, overwrite or delete a position
<i>Pos 2</i>	Save, overwrite or delete a position
<i>Pos 3</i>	Save, overwrite or delete a position
<i>Pos 4</i>	Save, overwrite or delete a position
<i>Pos 5</i>	Save, overwrite or delete a position
<i>Y-axis off</i>	Switch the control of the movement axis on or off
<i>Axial</i>	Change vertical movement to axial movement
<i>Limit</i>	Activate or deactivate the vertical or horizontal (X axis) limit
<i>Step injection</i>	The use of this function is not approved for medical applications
<i>Limit up</i>	Amend value for <i>Z-axis Limit</i> upwards
<i>Limit down</i>	Amend value for <i>Z-axis Limit</i> downwards
<i>Clean</i>	Axial movement out of the working range

Parameter	Function
<i>Z-axis only</i>	Only control of movements in the Z-axis. The control of movements in the X and Y-axis is deactivated
<i>LCD light</i>	Set the brightness level of the display
<i>Beeper</i>	Set the volume
<i>Joystick off</i>	Deactivates all joystick movements
<i>X-axis off</i>	Switch the control of the movement axis on or off
<i>Z-axis off</i>	Switch the control of the movement axis on or off
<i>X-axis only</i>	Only control of movements in the X-axis. The control of movements in the Y and Z-axis is deactivated
<i>Y-axis only</i>	Only control of movements in the Y-axis. The control of movements in the X and Z-axis is deactivated
<i>Dyn-mode</i>	Activate or deactivate the dynamic movement range

Parameter	Range of values	Function
<i>Joystick key</i>	<i>No function</i>	Deactivate the function of the joystick key
	<i>Switch position</i>	Double-click to go to the next saved position
	<i>Switch fine</i>	Double-click to go to the <i>fine</i> or <i>x-fine</i> working range

6.19.2 Executing *Softkeys*

1. Select a free softkey and confirm with *Enter*.
2. Select the required parameter and confirm with *Enter*.
3. Close the menu.
The selected parameter has been assigned to the free softkey.
The parameter appears on the application screen.

6.20 *Change appl function*



The use of this function is not approved for medical applications.

6.20.1 *Change appl* menu and parameters

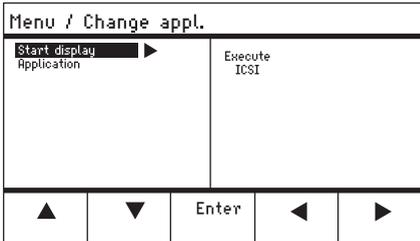


Fig. 6-7: *Change appl* menu

Parameter	Value	Range of values
<i>Start display</i>	Reactivate the start screen to select an application	EXECUTE
<i>Application</i>	Define the selected application as the start screen	<i>Cell transfer</i> <i>ICSI</i> <i>DNA injection</i> <i>Basic</i> <i>My application</i>

6.20.2 Defining the selected application as the start screen

1. Select *Start display*.
2. Confirm with *Execute*.
3. Close the menu.
The micromanipulator starts with the selected application.

6.20.3 Defining the *ICSI* application as the start screen

1. Select the *ICSI* application.
2. Confirm with *Enter*.
3. Close the menu.
The micromanipulator always starts with the defined *ICSI* application.

6.21 Service function

6.21.1 Service menu and parameters

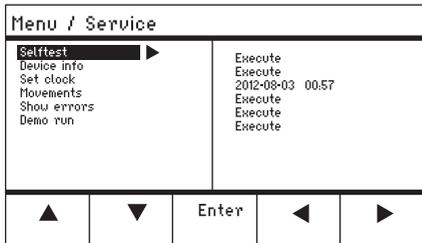


Fig. 6-8: Service menu

Parameter	Value	Range of values
<i>Selftest</i>	Move the motor module in all three axes and output error message	EXECUTE
<i>Device info</i>	Display the software version	EXECUTE
<i>Set clock</i>	Set date and time	YYYY-MM-DD 00:00
<i>Movements</i>	Show movement routes of the modules (X, Y, Z)	EXECUTE
<i>Show errors</i>	Display the last 10 error messages	EXECUTE
<i>Demo run</i>	Save the position and move to it	EXECUTE

6.21.2 Executing the *Selftest* function



CAUTION! Risk of crushing between the modules

The modules automatically move in all spatial axes.

- ▶ Do not reach into the movement range of the modules.

1. Select *Selftest* and confirm with *Enter*.
2. Confirm *Execute* with *Enter*.
The screen for the *Selftest* function appears.
3. Execute *Selftest* with *Start*.
The motors move up to the limit stops.
4. Terminate *Selftest* with *Stop*.

6.22 Resetting parameters to the factory settings

6.22.1 Perform reset

Reset all parameters to the factory settings.

1. Keep the *home* key pressed.
2. Switch on the device at the mains power switch.
The screen for *GENERAL RESET* appears.
3. Execute the function with *Yes*.
All parameters are now reset to the factory settings.

6.22.2 Carrying out a reset in the menu

Prerequisites

- An application has been selected.
1. Press the *menu* key.
 2. Select the *Function* menu.
 3. Press *Enter*.
 4. Select *User default* and confirm with *Execute*.
All parameters are now reset to the factory settings.

7 Troubleshooting

7.1 General errors

7.1.1 Motor module

Problem	Cause	Solution
Motor axes move in the wrong direction or do not match joystick movement.	<ul style="list-style-type: none"> • Motor module mounted incorrectly. • Incorrect installation parameters entered. • Direction of movement of axis inverted. 	<ul style="list-style-type: none"> ▶ Compare the installation parameters with the structure of the motor module. ▶ Check the orientation and structure of the modules. ▶ Check the connections of the modules at the control board. ▶ Cancel the inversion of the axis.

7.1.2 Capillary

Problem	Cause	Solution
Capillary moves too fast or too slow.	• Radius of working range incorrectly set.	▶ Set the radius with the selection dial or in the <i>Speed</i> menu.
	• Incorrect acceleration factor.	▶ In the <i>Installation</i> menu, set the value for the <i>Dyn-factor</i> parameter.
Capillary only moves to the side or vertically.	• Y-axis is disabled.	▶ The <i>Y off</i> function disabled.
Capillary does not move down far enough.	<ul style="list-style-type: none"> • The <i>Z-axis Limit</i> function is active. • Capillary is incorrectly adjusted. 	<ul style="list-style-type: none"> ▶ Deactivate the <i>Z-axis Limit</i> function. ▶ Readjust the capillary.

7.1.3 Control board and display

Problem	Cause	Solution
Device does not respond to keystroke when <i>Home</i> function is active.	<ul style="list-style-type: none"> The function is active. 	<ul style="list-style-type: none"> ▶ Press the <i>home</i> key again. The capillary moves down. ▶ Press the <i>Back manual</i> softkey. ▶ Move the joystick.
The display does not show anything or the device cannot be activated although the device is connected.	<ul style="list-style-type: none"> The power cable or power plug is loose. The device is switched off. 	<ul style="list-style-type: none"> ▶ Check the power cable or the power plug. ▶ Switch on the device.
	<ul style="list-style-type: none"> The fuse is defective. 	<ul style="list-style-type: none"> ▶ Replace the fuse. ▶ (see <i>Replacing fuses on p. 90</i>)

7.1.4 Joystick

Problem	Cause	Solution
Outer movement range of the joystick does not work.	<ul style="list-style-type: none"> Outer movement range is deactivated. 	<ul style="list-style-type: none"> ▶ In the <i>Installation</i> menu, set the value for <i>Dyn-mode</i> to <i>ON</i>.

7.1.5 Software and parameters

Problem	Cause	Solution
Parameters are not accessible for certain operations.	–	<ul style="list-style-type: none"> ▶ Enter parameters again. ▶ Carry out a reset and reset all parameters to the works settings. ▶ Readjust device.

7.2 Error messages

7.2.1 Warnings

Problem	Cause	Solution
<i>WARNING 1</i>	<ul style="list-style-type: none"> Will not occur in connection with medical applications because connecting the device for medical applications is not approved. 	<ul style="list-style-type: none"> ▶ –
<i>WARNING 3</i>	<ul style="list-style-type: none"> X-module is not connected. 	<ul style="list-style-type: none"> ▶ Switch off the device. ▶ Connect the plug of the X-module to the control board and tighten. ▶ Switch on the device.
<i>WARNING 4</i>	<ul style="list-style-type: none"> Y-module is not connected. 	<ul style="list-style-type: none"> ▶ Switch off the device. ▶ Connect the plug of the Y-module to the control board and tighten. ▶ Switch on the device.
<i>WARNING 5</i>	<ul style="list-style-type: none"> Z-module is not connected. 	<ul style="list-style-type: none"> ▶ Switch off the device. ▶ Connect the plug of the Z-module to the control board and tighten. ▶ Switch on the device.
<i>WARNING 6</i>	<ul style="list-style-type: none"> This warning will not occur in connection with medical use because connecting the device for medical applications is not approved. 	<ul style="list-style-type: none"> ▶ –

7.2.2 Errors

Problem	Cause	Solution
<i>ERROR 10 – ERROR 99</i>	<ul style="list-style-type: none"> Technical error. 	<ul style="list-style-type: none"> ▶ Switch the device off and back on. ▶ Reset the parameters to the factory settings. ▶ Contact Eppendorf Service.

7.3 Replacing fuses



DANGER! Electric shock.

- ▶ Switch off the device and disconnect the mains/power plug before commencing any servicing or cleaning procedures.
-

The fuse holder is located between the mains connection socket and the mains power switch. The fuses may only be replaced with the same type of fuse.

1. Disconnect the mains plug.
2. Pull the fuse holder out completely.
3. Replace the defective fuse.
4. Insert the fuse holder.

8 Maintenance

8.1 Cleaning



DANGER! Electric shock due to the ingress of liquid.

- ▶ Switch off the device and disconnect it from the mains/power line before commencing any cleaning or disinfection procedures.
 - ▶ Do not allow any liquids to enter the inside of the housing.
 - ▶ Do not spray clean or spray disinfect the housing.
 - ▶ Do not reconnect the device to the mains/power line unless both the inside and outside of the device are completely dry.
-



NOTICE! Damage due to aggressive chemicals.

- ▶ Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
 - ▶ If the device has been contaminated by aggressive chemicals, clean it immediately using a mild cleaning agent.
-



Clean the device after every use.

1. Wipe all surfaces with a cloth and mild detergent.
2. Wipe the painted parts and the aluminum surfaces with a cloth and mild detergent.
3. Polish with a dry cloth.

8.2 Disinfection/decontamination



- ▶ Select disinfection methods that comply with the legal regulations and guidelines for your area of application.
- ▶ If you have any questions about cleaning, disinfection and decontamination, please contact Eppendorf SE.

Prerequisites

- All device parts are cleaned.
- A disinfectant with an alcohol base (e.g., isopropanol or ethanol) is prepared.
- ▶ Wipe down all devices with a cloth and the disinfectant.

8.3 Service and maintenance

The user is not required to carry out servicing or safety inspections.



Eppendorf SE recommends having a service carried out every 12 months.

- Contact Eppendorf Service for more information.



Only authorized service personnel are permitted to carry out software updates.

The services of Eppendorf SE are available for servicing and certification of your device.

Service provisions:

- Service
- Operational qualification (OQ) according to manufacturer specifications
- Software update

Information on the services offered can be found on our webpage www.eppendorf.com/epServices.

9 Technical data

Motor module	
Travel, maximum	20 mm
Step motors	X-module, Y-module, Z-module
Weight	2150 g

Module (X, Y, Z)	
Type	Step motors
Step size (calculated resolution)	< 20 nm
Speed, maximum	10000 µm/s
Width	129 mm
Depth	51 mm
Height	36 mm
Weight	570 g

Swivel joint	
Direction of rotation	-45° – +90°
Capillary change	Direction of rotation forwards
Sample change	Direction of rotation backwards

Angle head	
Operating angle	0° – 90°
Weight load, maximum	200 g

Control board	
Control	Joystick
Working range	<i>coarse, fine, x-fine</i>
Width	205 mm
Depth	288 mm
Height	152 mm
Weight	1800 g

9.1 Power supply

Voltage	AC 100 V – 240 V, ± 10 %
Frequency	50 Hz – 60 Hz
Power consumption	30 W
Protection class	I
Overvoltage category	II (IEC 61010-1)
Micro fuse	250 V, 1.6 A, T

9.2 Interfaces

Module (X, Y, Z)	SubD9, female
PC/external device	Serial interface SubD9, male
Service connection	USB

9.3 Ambient conditions

Environment	For indoor use only. The surroundings must not be moist.
Ambient temperature	15 °C – 35 °C
Relative humidity	30 % – 65 %, non-condensing.
Atmospheric pressure	79.5 kPa – 106 kPa Use up to a height of 2000 m above sea level.
Pollution degree	2 (IEC 664)

10 Transport, storage and disposal
10.1 Disassembling and packing the micromanipulator

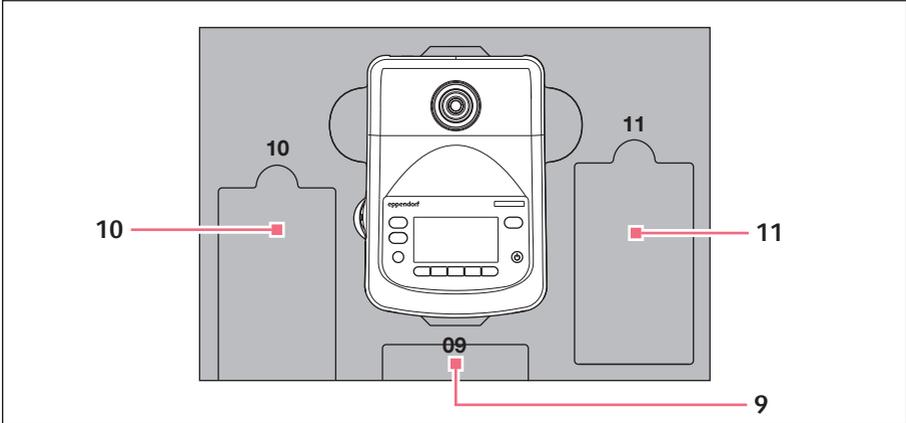


Fig. 10-1: Base padding

9 Control panel

11 Connecting cable

10 Mains/power cord

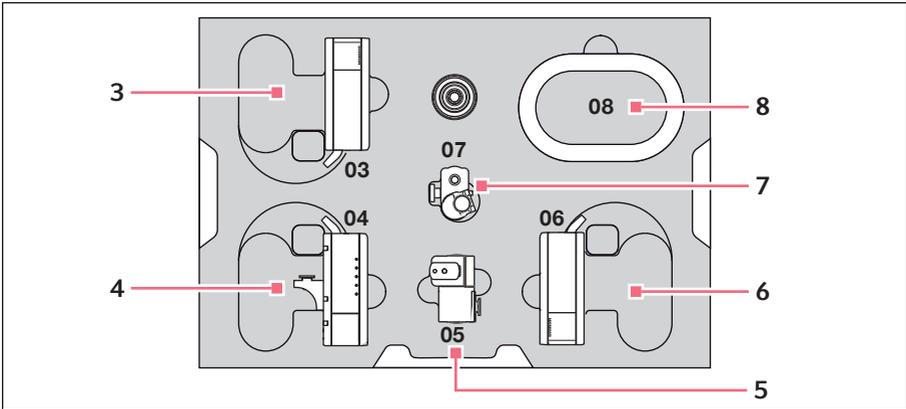


Fig. 10-2: Middle padding

3 Z-module

4 Y-module with YZ connector

5 Swivel joint

6 X-module

7 Angle head

8 Cable sheathing

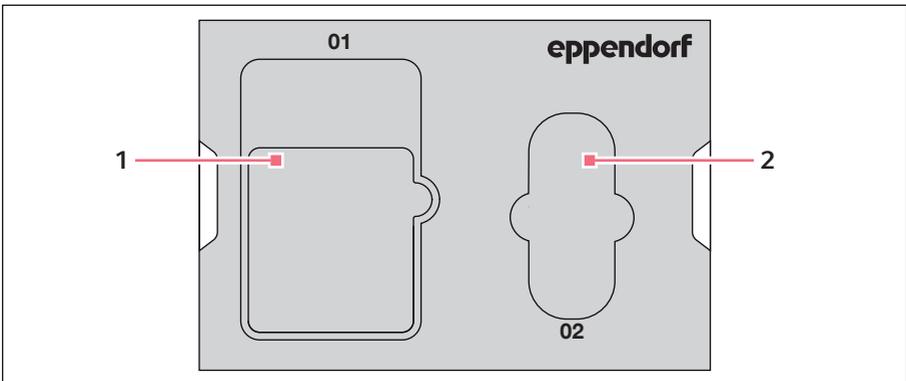


Fig. 10-3: Lid padding

1 Instructions

2 Tool bag

Prerequisites

- The original box with foam padding is available.
1. Center the Z-module, X-module and Y-module manually with the joystick.
The module housing and the movable rail must be flush.
 2. Switch off the micromanipulator at the mains/power switch.
 3. Pull the power cable and place it in recess **10**.
 4. Unscrew the module plug connections from the control board.
 5. Unscrew the connection to the external device and place it in recess **11**.
 6. Place the control board in recess **09**.
 7. Align the joystick so that it is straight and position the middle padding with the recess above the joystick.
 8. Remove the cable sheathing and place it in recess **08**.
 9. Remove the capillary holder.
 10. Loosen and pull off the angle head.
 11. Re-tighten the screws at the angle head and place them in recess **07**.
 12. Undo the screw on the swivel joint.
 13. Pull off the X-module with swivel joint.
 14. Loosen the second screw at the swivel joint and pull the swivel joint from the X-module.
 15. Tighten both screws at the swivel joint and place the swivel joint in recess **05**.
 16. Place the X-module in recess **06**.
 17. Loosen the screw connecting the YZ connector to the Z-module.
 18. Pull off the YZ connector with Y-module.
The YZ connector remains at the Y-module.
 19. Tighten the screws at the YZ connector.
 20. Place the Y-module with YZ connector in recess **04**.
 21. Loosen the screw connecting the Z-module holder to the Z-module and pull off the Z-module.
 22. Tighten the screw of the Z-module holder.
 23. Place the Z-module in recess **03**.
 24. Insert the lid padding.
 25. Place the tool bag in recess **02**.
 26. Close the box and send it to the authorized service.

10.2 Storage

Air temperature	Relative humidity
-40 °C – 60 °C	10 % – 95 %

10.3 Contact details

10.3.1 Manufacturer Eppendorf SE

Eppendorf SE

Barkhausenweg 1

22339 Hamburg

GERMANY

eppendorf@eppendorf.com

10.3.2 Local Eppendorf distributor

www.eppendorf.com/contact

10.4 Decontamination before shipment

If you are shipping the device to the authorized Technical Service for repairs or to your authorized dealer for disposal please note the following:



WARNING! Risk to health from contaminated device.

1. Observe the information contained in the decontamination certificate. It is available as a PDF document on our webpage (<https://www.eppendorf.com/decontamination>).
2. Decontaminate all parts to be shipped.
3. Include the fully completed decontamination certificate in the shipment.



Disinfect the device (see *Disinfection/decontamination on p. 91*).

10.5 Transport



NOTICE! Damage to the control board as a result of incorrect handling.

- ▶ Grasp the control board on the housing.
- ▶ Do not lift the control board using the joystick.
- ▶ Never place the control board on the joystick.

Air temperature	Relative humidity
-40 °C – 60 °C	10 % – 95 %

Carry out the following steps before transport:

1. Move the modules into the center position.
The movable rail must not protrude over the module.
2. Disassemble the module unit before transport.
3. Only use original packaging for transport.

10.6 Disposal

As it is necessary to dismantle the product for disposal, disposal must be carried out professionally by a competent disposal partner for safety reasons.

Observe the relevant legal regulations when disposing of the product.

Eppendorf provides information about the dismantling and disposal of the product. If you have any questions, contact your authorized Eppendorf Service.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2012/19/EU pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this:



As the disposal regulations may differ from one country to another within the EU, please contact your supplier for more information.

Ordering Information

TransferMan® 4m

English (EN)

11 Ordering Information**11.1 Accessories for TransferMan 4m**

Order no. (International)	Description
5192 071.005	Spare parts kit 1 slider (complete), 2 machine screws M2.5×6 (swivel joint), 2 set screws (angle head), 2 compression springs (knurled screw angle head)
5192 072.001	Positioning aid 2 pieces for universal capillary holder, capillary holder 4

11.2 Microscope adapter

Order no. (International)	Description
5192 301.000	Adapter for microscope Leica 1 DMi8, DMi3000 B, 3000 M, 4000 B, 5000 B, 5000 M, 6000 B, DM IRB E, DM IRE 2
5192 302.007	Adapter for microscope Leica 2 DM IL LED, HC
5192 306.002	Adapter for microscope Olympus 1 IX50, IX51, IX70, IX80, IX81
5192 307.009	Adapter for microscope Olympus 2 IX53 IX3-ILL, IX73 IX3-ILL, IX83 IX3-ILL, useable also with motorized condensor IX3-MLWCDA
5192 308.005	Adapter for microscope Olympus 3 IX53 IX2-ILL30
5192 316.008	Adapter for microscope Nikon 1 Eclipse Diaphot 200, 300, Eclipse Ti-E, Ti-U, Ti-S, TE200, TE300, TE2000
5192 317.004	Adapter for microscope Nikon 2 Eclipse Ts2R

Order no. (International)	Description
5192 318.000	Adapter for microscope Nikon 3 Eclipse Ti2-U, Ti2-A, Ti2-E
5192 311.006	Adapter for microscope Zeiss 1 AxioObserver 3, 5, 7, AxioObserver A1, D1, Z1, Axiovert 200
5192 312.002	Adapter for microscope Zeiss 2 Axio Vert.A1

11.3 CellTram 4m and accessories



For availability in your country please contact your local distributor.

Order no. (International)	Description
5196 000.021	CellTram 4m Air (EU, EFTA)
5196 000.056	CellTram 4m Air (Australia)
5196 000.048	CellTram 4m Oil (EU, EFTA)
5196 000.064	CellTram 4m Oil (Australia)
5196 061.004	Injection tube Air White ring mark, I.D. 0.5 mm, length 1.3 m
5196 089.006	Injection tube Oil Blue ring mark, I.D. 1.0 mm, length 1.3 m
5196 088.000	Filling and Cleaning set incl. filling tube, Luer lock adapter, 2 syringes CellTram 4

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Declaration of Conformity

The product named below fulfills the requirements of directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product name:

Eppendorf TransferMan® 4m

Product type:

Electric motor driven micromanipulator

Relevant directives / standards:

93/42/EEC: EN 1041, EN ISO 13485 + AC, EN ISO 14971, EN ISO 15223-1, EN 62304, EN 62366-1

2014/35/EU: EN 61010-1, EN 61010-2-081

2014/30/EU: EN 61326-1, EN 55011

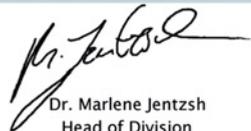
2011/65/EU: EN 50581

Further applied standards: UL 61010-1, UL 61010-2-081
CAN/CSA C22.2 No. 61010-1, CAN/CSA C22.2 No. 61010-2-081
EN 61326-2-6

Hamburg, April 29, 2021



Dr. Wilhelm Plüster
Management Board



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