INSTRUCTION MANUAL

COVERSLIPPING MACHINE
COVER-TECH CTM 6

MICROM International GmbH
Robert-Bosch-Str. 49

D- 69190 Walldorf

CERTIFICATION

MICROM International GmbH certifies that this instrument has been tested and checked carefully. Its technical data was verified before shipment to be in accordance with the published specifications.

WARRANTY

This MICROM product is warranted against defects in material or workmanship for a period of 1 year. Parts which prove to be defective during the warranty period will be repaired or replaced free of charge by MICROM International GmbH. No other warranty is expressed or implied. Unauthorized modification or repair by third party persons will void the warranty.

This instruction manual will be supplied together with each instrument. Further copies can be ordered at the nearest MICROM sales office by giving the serial number of the instrument, the number of the instruction manual and the date of issue.

This instruction manual is available in the following languages:

	Cat. No.
German:	387705
English:	387706
French:	387707
Spanish:	387741
Italian:	387708

INTENDED USE

Dear Customer,

Before operating the instrument, please read these instructions carefully to familiarize yourself with its proper operation and functions.

Only skilled or specially trained personnel must work with this instrument. Please observe the listed and marked safety messages as well as the regulations of your respective lab.

MICROM Ser. No.:.....

Please enter the serial number, which is placed on the type plate on the rear side of the instrumen. This way, questions and service can be handled faster.

Instruction Manual No.: 387706

Issue: September 28, 2005

MICROM International GmbH
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EC Certificate of Conformity

Name and address of the manufacturer: MICROM International GmbH
Robert-Bosch-Straße 49
D-69190 Walldorf

Product designation: Coverslipper
Type reference: CTM 6

Notification to Competent Authorities:
These medical device have been registered with the German authority as "General Histology Instruments" under the EDMA-classification code: 23-06-01

The designated product complies with the laid down regulation:

DIRECTIVE 98/79/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 October 1998 on in vitro diagnostic medical devices

The designated product complies with the EC regulations by strictly observing the following norms:

DIN EN ISO 14971:2001-03
Medical devices - Application of risk management to medical devices (ISO 14971:2000).

DIN EN 61010-1:2002-08
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements (IEC 61010-1:2001).

DIN EN 61010-2-101:2003-09
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-101: Particular requirements for In-Vitro-Diagnostic-(IVD)-Medical instruments.

DIN EN 61010-2-081:2002-12
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-081: Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes (IEC 61010-2-081:2001).

DIN EN 61326:2002-03
Electrical equipment for measurement, control and laboratory use - EMC requirements (IEC 61326-1:1997 + A1:1998 + A2:2000); German version EN 61326:1997 + A1:1998 + A2:2001

DIN EN ISO 9001:2000
Quality management systems - Requirements (ISO 9001:2000)

Hans Heid
Managing Director

Walldorf, 10 February 2004

SAFETY PRECAUTIONS

WARNING SIGNALS AND SYMBOLS

The installation and routine use of the COVER-TECH CTM 6 is easy and safe if the instructions in this manual are being observed.
However, the situations which might be risky for the personnel or equipment are specially marked in this manual with the following symbols and messages.

Note:
Special instructions regarding operation of the instrument.

Caution:
Special precautionary measures to prevent damage to equipment. For a long lifetime of the equipment, please observe these instructions carefully.

Danger:
Special warning messages to prevent harm to persons and/or serious damage to equipment. For your own safety, please observe these instructions carefully.

Warning of biological hazards:

Separate taking back of electrical and electronic instruments in the countries of the European Union:
This is to be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management.
This product, being an electro and/or electronic instrument, must be treated separately within the waste management process (WEEE).

Safety precautions

CAUTION!

Please observe the following general precautions during operation of this instrument. Failure to comply with these precautions violates safety standards and the intended use of the instrument. MICROM International GmbH is not liable for misuse of the instruments and failure to comply with basic safety requirements.

INSTRUMENT GROUNDING

To avoid injury from electrical current, the instrument must be connected to the safety ground. The instrument is equipped with a three wire ground plug. The power outlet must be connected to the safety ground and must meet the International Electrotechnical Commission (IEC) regulations.

CAUTION: VOLTAGE

Never remove instrument covers during operation. Component replacement as well as adjustments must only be made by trained service personnel.

DANGER IN EXPLOSIVE ENVIRONMENT

The instrument must not be operated in the presence of flammable gases.

DANGER WHEN USING OPERATING MATERIALS

Xylene and other solvents may be considered hazardous. For this reason, please observe the stipulated safety measures to avoid contact with eyes and skin (e.g. wear protective gloves).

Hazard of biological danger

Specimens used during the intended operation of the instrument might potentially be infectious. For this reason, it is recommended to observe the general laboratory regulations concerning protection against danger of infection.
Information on decontamination media, their use, dilution and effective range of application can be read in the Laboratory Biosafety Manual : 1984 of the World Health Organization.

CARE IN USING THE INSTRUMENT

When working with the instrument, never put your fingers or hands into the instrument. For cleaning and maintenance work always turn off the instrument. Protect yourself against broken glass and sharp edges by observing suitable safety measures.

To avoid danger of infection resulting from injury due to broken glass or sharp edges, appropriate protection measures must be observed.

HAZARD OF MALFUNCTION

To avoid the hazard of malfunction of an instrument, it must only be operated in a controlled electromagnetic environment. This means, that transmitters such as mobile phones must not be operated in their close vicinity.

WASTE DISPOSAL

All debris from operation must be disposed off in accordance with the respective regulations of the lab.

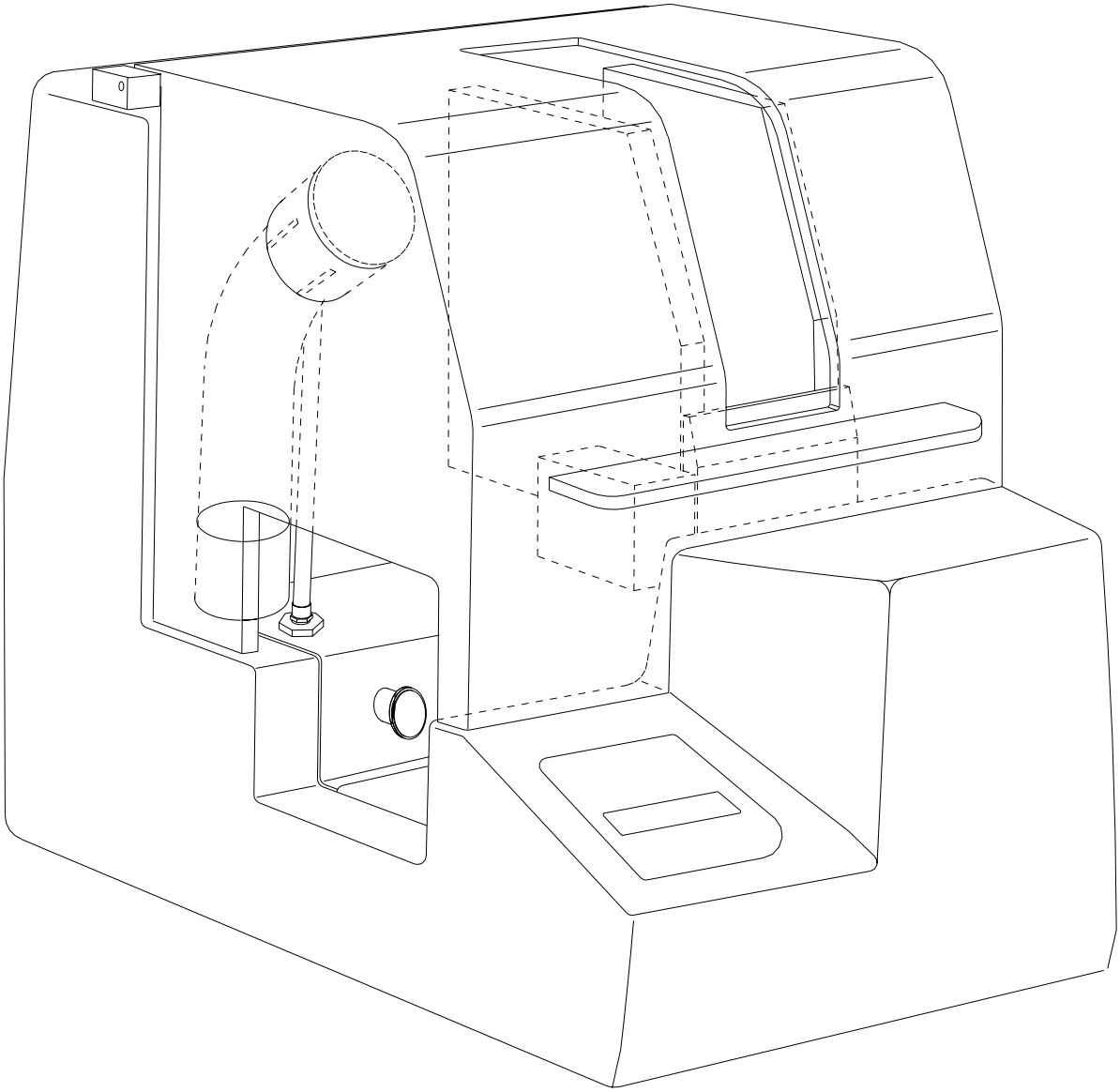


Fig. 1

MICROM International GmbH
Robert-Bosch-Str. 49

D- 69190 Walldorf

Part 1 Introduction

1-1 Description of the Cover-Tech CTM 6

The Cover-Tech CTM 6 from MICROM International GmbH is an efficient coverslipping machine for the application in histology and cytology labs.

Up to 400 slides per hour can be processed.
The Cover-Tech CTM 6 is completely equipped with an automatic error code indication, touchpad keyboard and a function counter.

Slides of 26x76x1 mm or 25x75x1 mm can be used.

For continuous loading, up to two slide baskets with 30 or 19 slides each can be inserted into the magazine.

The Cover-Tech CTM 6 is available in four different versions for coverglasses 40, 50, 55 or 60 mm (see part 2-8, Change to different coverglass sizes). Up to 400 coverglasses can be loaded into the coverglass magazine.

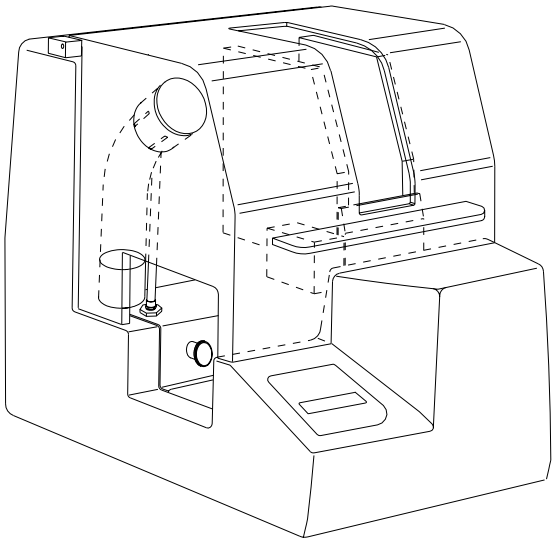


Fig. 2

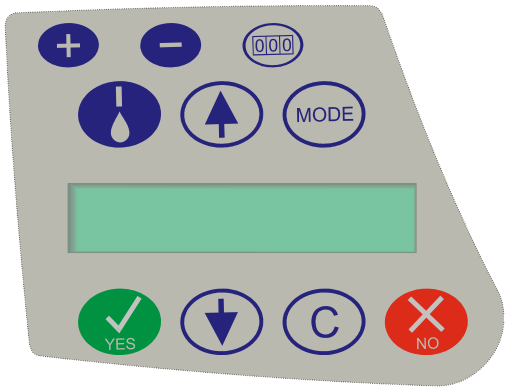


Fig. 3

The amount of coverslipping medium can be adjusted by pressing the buttons + or -.

The instrument is equipped with a fan. Either an exhaust housing with integrated charcoal filter or a connection tube can be attached.

1-2 Technical specifications of the COVER-TECH CTM 6

Working speed:		up to 400 slides /h
Slides:	ground or cut edges	26x76x1 mm or 25x75x1 mm
	divergences:	long: 74,5 - 76,5 mm wide: 24,7 - 26, 3 mm thickness: 0,8 - 1,2 mm
Magazine capacity:	30 or 19 slide baskets	2x30 or 2x19 slide baskets
Coverglasses:		40, 50, 55 or 60 x 24 mm, no. 1
	divergences:	long: 40, 50, 55 or 60 mm/ + 0,3 mm/ - 1 mm wide: 23,5 - 24,3 mm thickness: no. 1, 0,13 - 0,17 mm
Capacity of coverglass magazine:		up to 400 coverglasses
Coverslipping medium:		all commercially available coverslipping media
Capacity of coverslipping medium		100 ccm
Pump volume:		up to 250 µl/slide
Storage temperature range		-20°C up to +50°C
Operating conditions		+5°C up to +40°C (at a rel. air moisture of 60%) altitude up to 2000 m NN for indoor use only
Power requirements		100 V - 240 V/1 A +/-10 %/ 50 - 60 Hz
Internal fuses		1 x T3.15AH, 1 x T1,6AH
Secondary circuits		
Overvoltage category		II
Pollution degree		2
Acoustic pressure		50 dB
Dimensions:		460x450x355 mm (wide/deep/high) (Deep: 530 mm with exhaust housing)
Weight:		20 kg

1-3 List of recommended mounting media

Mounting Medium	Solvent xylene alcohol toluene water	Pump vol. setting ✸ 1…5 ✸✸ 6…11 ✸✸✸ 12…19 ✸✸✸✸ 20…40 ✸✸✸✸✸ 41…99
Richard-Allan Scientific Signature Series # 4111	**toluene**	✸✸
Stephens Scientific Cytoseal XYL	**xylene**	✸
Pertex	**xylene**	✸✸✸
Histokitt	**xylene**	✸✸✸
Entellan new	**xylene**	✸✸

Part 2 Operating Instructions

2-1 Setting up the Cover-Tech CTM 6

Unpack the instrument and dismount the packing. Lift the instrument and place it under a suction hood or on a working place equipped with a ventilation device.

Note:
For this, please note that there is always sufficient space behind the instrument to guarantee unhindered access to the power switch at any time.

For the removal of solvent vapors, the instrument can optionally be used with the integrated ventilation. For this, hang up the enclosed exhaust housing with integrated charcoal filter into the sparing of the rear side of the instrument (fig. 4). Optionally, the unit may be vented with a ∅ 50 mm hose to a ventilation source.

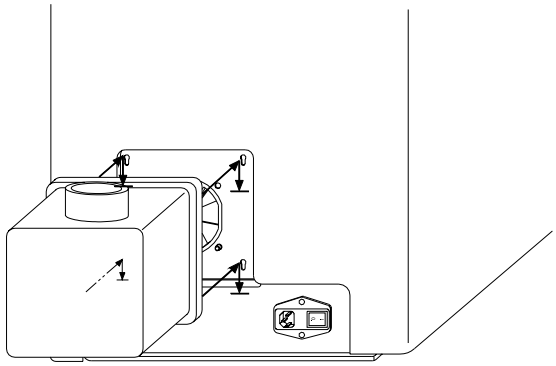


Fig. 4

2-2 Initial operation

Connect the power cord and plug it into the socket.
Turn on the power switch on the rear side of the instrument.

Note:
Before the initial operation, air is inside the system. To remove it, first loosen the screws (fig. 16.1) and remove the dispenser. To remove the dispenser from its holder to the side, press the black plastic ring above the spring.

Fill the container for the coverslipping medium to the lower mark with Xylene or another solvent matching the coverslipping medium.
Place the attached disposable syringe (fig. 5) with an adequate volume onto the dispenser needle. Remove the solvent by pulling the syringe piston. Repeat this process until the liquid level has reached the bottom sieve and no bubbles can be seen anymore in the dispenser hose. Fill the container with the appropriate coverslipping medium and repeat the above-described suction process several times, until coverslipping medium can be drawn off without bubbles.

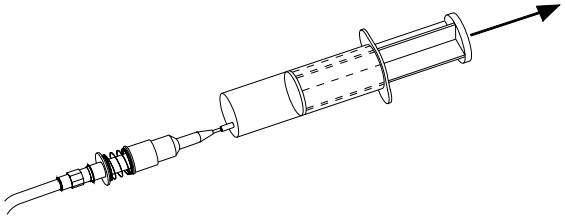


Fig. 5

Then install the dispenser needle again. Turn on the instrument on the rear side and move the dispenser into the upper position by pressing the red STOP button.
Place a cloth or paper under the dispenser needle and press the Pump button for pumping processes.
Please note that coverslipping medium is pumped evenly from the dispenser needle without bubbles. If necessary, repeat the suction process.

The container, which is filled with the corresponding solvent (fig. 7), prevents the dispenser needle from getting dry. Moreover, it prevents splashes or hardenings resulting from the coverslipping medium on the needle.

Fill this container with the solvent (e.g. Xylene) matching the coverslipping medium until it is filled up to two thirds.

Note:
Change or refill the solvent daily or as needed. Clean thoroughly once a week after removal according to fig. 6.

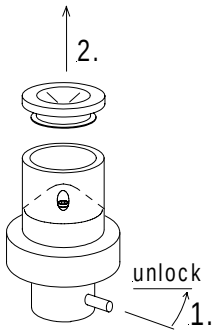


Fig. 6

Fig. 7

Press the CLEAR button C. The dispenser together with the needle moves back in its home position. The display shows status "**1:INSERT BASKET**".
Insert the slide basket into the basket magazine.
The display shows status "**2:READY**".
The instrument is now ready for coverslipping.

2-3 Daily routine and shutting off

When turning on the instrument, the display shows "**1:INSERT BASKET**". The instrument is ready for the pump test.
To check the pump function, press the STOP button.
The dispenser together with the needle moves out of its home position. Then the display shows: "****STOP****".
Place a paper towel under the dispenser needle and press the Pump button. As long as this button is being pressed, solvent or coverslipping medium is transported through the dispenser needle.
Then press the CLEAR button (C). The dispenser together with the needle moves back in its home position. The display shows: "**1:INSERT BASKET**".

Insert the slide basket into the basket magazine (fig. 10) in a way that the side which is marked with "UP" shows upwards. Then the display shows: "**2:READY**".

Press the green START button. The display shows: "**3:RUNNING**".
The slides are now being coverslipped and put back into basket again.

For an immediate interruption, press the Stop button. The instrument stops in the current condition. However, the dispensing unit moves into the upper position.

Note:
For continuous processing, another basket can be inserted immediately after having started the coverslipping process.

After having finished the coverslipping process and having reached the final position of the slide basket, it will be pushed out sidewards of the basket magazine via an expelling arm. The basket can now be removed.

2-4 Coverslipping

Check if there are sufficient coverglasses in the coverglass magazine.

Insert the baskets into the basket magazine (fig. 8). The marking "UP" on the basket must show upwards. Then the display shows: "**2:READY**".

Press the Start button. The display shows: "**3:RUNNING**"
The slides are now being processed and removed into the basket.

To immediately interrupt the coverslipping process, press the Stop button. The instruments stops in the current condition. However, the dispensing unit (fig. 9.1) moves into its upper position.

Note:
For continuous processing, another basket can be inserted immediately after having started the coverslipping process.

After having finished the coverslipping process and having reached the final position of the slide basket, it will be ejected out of the basket magazine via an expelling arm. The basket can now be removed.

Note:
Two different slide baskets for 19 or 30 slides are available. If slide baskets for 19 slides are used, please note that the high insertion plate is inserted according to fig. 8. This plate compensates the height difference between 30 and 19 slide baskets. Thus avoiding that the smaller 19 basket falls down.

Caution:
Never use the adapter together with baskets for 30 slides. Specimens and instrument might be damaged!

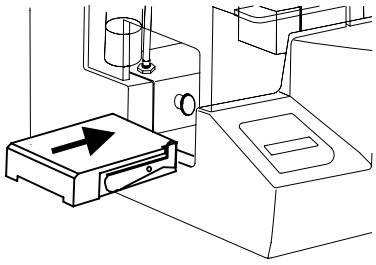
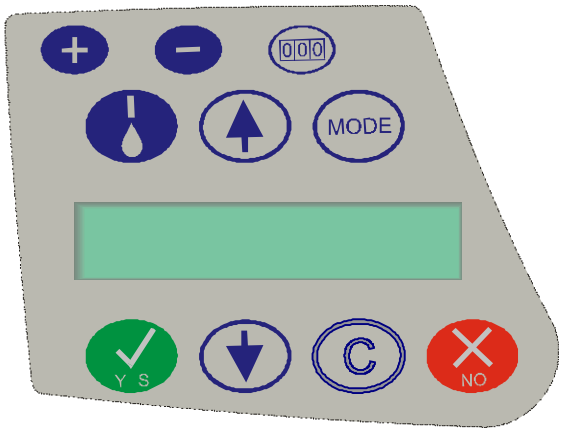


Fig. 8

2-4-1 Summary of the operating buttons



The amount of **mounting medium** can be increased by pressing the button (+) or decreased by pressing the button (-) (from 1 up to 99). The display shows: **MM:9** (e.g. **m**ounting **m**edium, stage 9).

The **pump button** allows pumping of the mounting medium. It is advised to check the functions of the pumping process, especially after extended period of non-operation. The pump function can be carried out after having pressed the STOP button as long as there is not slide basket inside the magazine.

STOP button: Press this button to immediately interrupt the coverslipping process at any time. If a coverslipping process is not carried out, the transportation head/coverslipping (fig. 9.1) unit moves into the upper position to allow easy access and a manual movement of the head. The display shows: **4:STOP/SERVICE**.

With the **CLEAR** button all inputs can be cleared and the instrument moves into its starting position. After an acoustic signal, a message appears showing that there should be no coverglass on the carrier plate (fig. 9.2).

During routine operation, the green **START** button is to start a coverslipping process after having inserted the slide basket. The display shows: **3:RUNNING**. In the parameter menu, this button is used to select the respective submenus (YES).

Arrow upwards: After having pressed the STOP button, the carrier plate for the coverglasses is moved into the instrument. In doing so, a coverglass is given from the stack. Press the button **C**, to move backwards. In the service mode, this button is used to scroll upwards in the menus.

Arrow downwards: Press this button to move the slide basket rapidly downwards. This is especially helpful, when the basket is only partly loaded with slides.
In the service mode, this button is used to scroll down in the menus.

Counter reset button: The instrument is equipped with two counters. One may be reset to monitor daily/weekly throughput and can be reset with this button. When turning on the instrument the second counter total is shown for a short time. This indicates the cumulative total of this instrument and cannot be reset.

This button is used to set customer specific parameters, e.g. the coverglass size which is now being used, language selection and the beep sound (see part 2-8 and 2-9).

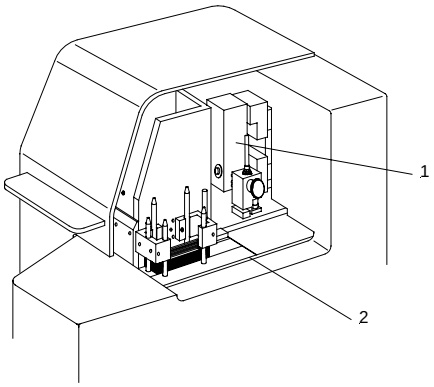


Fig. 9

2-5 Filling the coverglass magazine with coverglasses

Depending on the instrument version, coverglasses with a length of 40, 50, 55 or 60 mm can be used. Up to 400 coverglasses can be loaded into the coverglass magazine.

First remove the compressing weight (fig. 10) from the coverglass magazine (fig. 10).
Before you insert the coverglasses into the coverglass magazine (fig. 1), check them. They should be dry and should not stick to each other resulting from long storage or moisture. Moreover, check the coverglasses for breaks and other damage by holding the coverglass stack against the light.

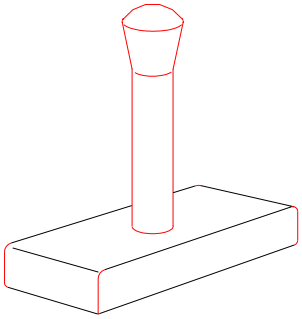


Fig. 10

Load the cover glass stack from the package onto the loading bridge (fig. 11a.1). Press the inserting tool (fig. 11a.2) and place the fork under the stack. Release the inserting tool and the stack will be clamped.

Lift inserting tool with stack into coverglass magazine and place the stack in position.
Press inserting tool and pull it out of the stack to the side.

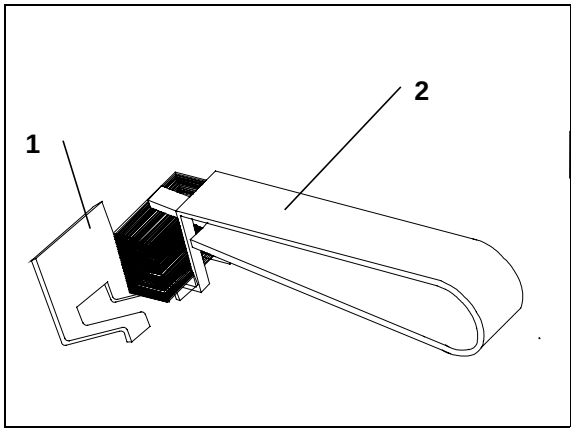


fig. 11a

Then, carefully place the compressing weight (fig. 10) onto the coverglasses.

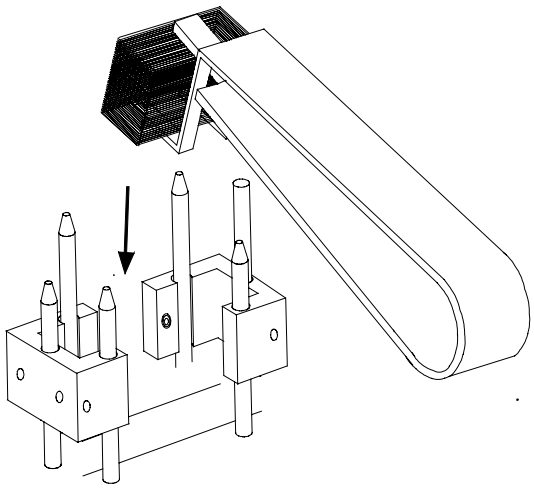


fig. 11b

2-6 Filling the container for coverslipping medium

All commercially available coverslipping media can be used.

The coverslipping medium container has a minimum and maximum marking. Refill the container before the lower (min) marking has been reached.

To fill the container (fig. 12.1), pull off the black cap (fig. 12.2). Slowly pour in the desired amount of coverslipping medium using care to avoid creating bubbles. Do not exceed the maximum fill level. Replace the black cap (fig. 12.2) onto the container.

Note:
For the initial set up process or after having completely emptied the container, please see part 2-2.

Before using another coverslipping medium, carefully clean the instrument when changing the medium.

Caution:
The mixture of several mounting media can cause major damage to the instrument.

To avoid the intensive and very time-consuming cleaning work, we recommend to use another pump unit with container for coverslipping medium as well as another dispenser unit.
For mounting and dismounting the pump and dispenser, please see part 5-1.

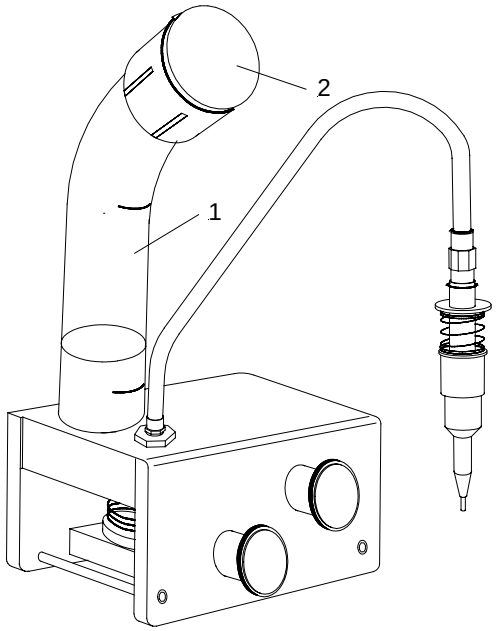


Fig. 12

2-7 Refilling/changing the solvent

The container filled with solvent prevents the dispenser needle from getting dry when it is in its home position.

Normally, the container should be filled up to two thirds with solvent.
To remove the container, turn it by 90° to left or right side, until the locking pin can be taken out of the sparing (fig. 13).

Note:
Carefully clean spilled solvent.

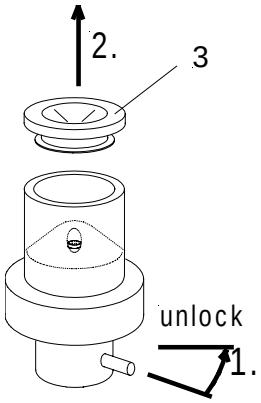


Fig. 13

Dispose of the solvent/coverslipping medium mixture from the container in an appropriate way and thoroughly clean it.

Refill the container with new solvent. Replace the cover (fig. 13.3). Re-insert the container and lock it in by turning it (fig. 13).

Fig 14

2-8 Change to different coverglass sizes

With the coverslipper CTM 6 coverglasses with 24 x 40 mm, 24 x 50, 24 x 55 mm and 24 x 60 mm can be processed.
To adjust the instrument to the respective size, it is necessary to change three parts in their position and to change one software value.

For this, please proceed as follows:

1. Loosen the screw with the red ring and remove the vacuum cup holder (fig. 15a.1).
   Four vertical rows of holes become visible. To rule out a wrong positioning of the vacuum cup holder, the unused three threaded holes are closed by set screws. Unscrew the set screw of the desired fastening position (fig. 15a) by means of a hex head wrench (size 2) and insert it into the previously used threaded hole.
   The vacuum cup holder can now be placed into the new fastening position.

2. A clasp (fig. 15b.2) for the fixation of the removed coverglass is placed on the coverglass carrier plate. Remove the clasp by loosening the fastening screw via a hex head wrench (size 2,5).
   Select the respectively marked clasp and insert it in a way that the guide pins fit into the last pair of holes. Insert the fastening screw into the thread corresponding with the selected coverglass (see fig. 15b). Then tighten the screw.

3. The coverglass magazine must also be adjusted to the new coverglass size. For this loosen the fastening screw on the front part of the coverglass magazine (fig. 15c) and remove it. Move the carrier plate until the sparings (fig. 15b.1) on the guide plate allow pulling the magazine part off without colliding with the metal pins. Place the magazine part into the desired position and tighten it again.

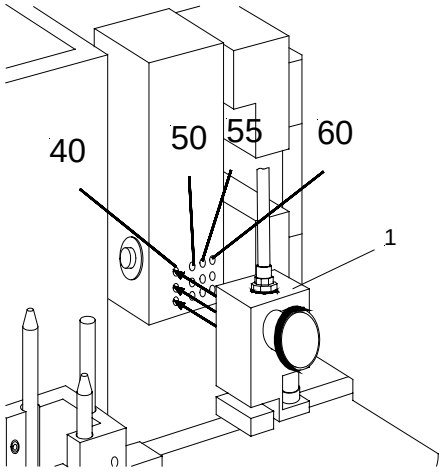


Fig. 15a

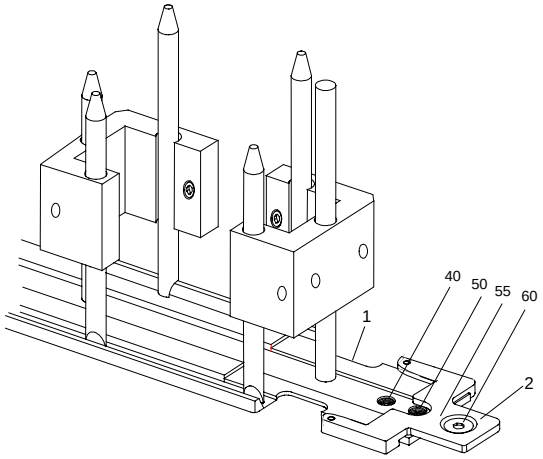


Fig. 15b

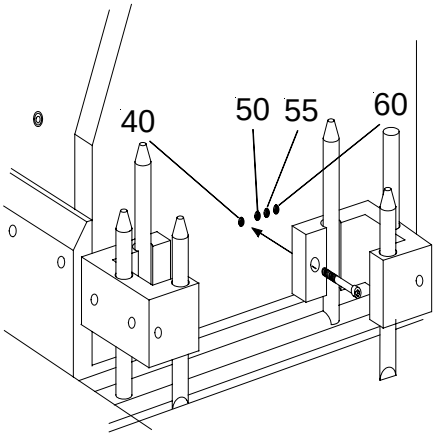


Fig. 15c

4. The length of the coverslipping application onto the slide depends on the coverglass size being used. For this reason, the length of the application must be altered in the software of the instrument.
   For this, turn on the power switch of the instrument and press the STOP button.

   Then press the MODE button to enter the conversion mode.
   The set-up menu appears and the display shows: "COVERGLASS LENGTH". Acknowledge this submenu via the START-button (YES). The display now shows the actual coverglass setting.

5. Now set the value via button  or  according to the appropriate coverglass size.
   Confirm the setting via the START button (YES) and quit the set-up menu by pressing the C button twice.

2-9 Customer-specific settings

2-9-1 Setting the coverglass length

The length of the coverslipping application onto the slide depends on the coverglass size being used. For this reason, the length of the application must be altered in the software of the instrument.
For this, turn on the power switch of the instrument and press the STOP button.

Then press the MODE button to enter the conversion mode.
The set-up menu appears and the display shows: "COVERGLASS LENGTH". Acknowledge this submenu via the START-button (YES). The display now shows the actual coverglass setting.

Now set the value via button  or  according to the appropriate coverglass size.

Confirm the setting via the START button (YES) and quit the set-up menu by pressing the C button twice.

2-9-2 Selecting the language

The information on the display can be shown in four different languages.

The following languages are available:

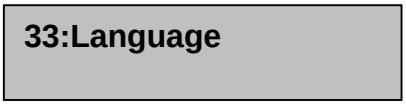
- German
- English
- French
- Spanish

For this:

Press the button NO.

Press the button MODE.

Then press the button ↓. The display shows the following indication:



Confirm this with the button YES.

All languages that can be selected are shown. However, the active setting is shown first.

Press the arrow buttons to select the desired language and confirm it with the button YES.

Press the button C twice to be able to work again with the instrument.

2-9-3 Turning on/off the beep sound of the buttons

To turn the beep sound of the buttons on or off, please proceed as follows:

Press the button NO.

Press the button MODE.

Press the button ↓ twice.
The display shows:

34: Beep sound

Confirm this with the button YES.

The lower menue line shows the settings: 1=ON 2=OFF followed by the number corresponding with the actual setting.

To choose the other option, press the buttons + or −. Confirm the setting with the button YES.

Press the button C twice to be able to work again with the instrument.

2-9-4 Setting the pump start delay

The inertia of the medium flow results in a delay when applying the medium. This can be compensated by means of an adjustable start delay of the slide transportation.

It is technically carried out in a way that the pump is started at a certain time during the operating cycle. However, the transportation sledge is started with a variable and/or adjustable time delay, resulting in a variable starting point on which the medium is applied onto the slide. This way, the distance between medium application and labelling area of the slide can be adjusted.

After having pressed the green YES button (YES), the opposite display appears:

1: Pump start add. time

In the opposite example, the motional process of the slide is started with a delay of 250 ms in relation to the pump start.

The value can be altered via the (+) and (−) button.

Pump start delay Add.: 250 ms

An increased value for the delay results in a medium application closer to the labelling area. A decreased value results in an application, which is further away.

2-10 Error code indication

Indication:	**Cause:**	**Remedy:**
5: VACUUM ERROR Check coverglass	The vacuum monitoring switch detected a vacuum loss during coverglass transportation. Possible causes: 1. Missing coverglass.	Refill coverglasses.
	2. Broken coverglass	Carefully remove broken coverglass and possible glass fragments. Simultaneously press the buttons and to avoid that coverslipping medium is put on the first slide. Then start the coverslipping process again.
	3. Soiled vacuum cup.	Loosen the screw with the red ring to remove the vacuum cup holder. Clean possible waste of coverslipping medium by using a cotton swab moistened with the corresponding solvent.
	4. Defective vacuum switch.	Please call an authorized service technician.
6: ERROR Check carrier	Carrier plate is blocked or not in its end position.	Press button . Check carrier plate for blocking elements. Press button to reset.
7: ERROR Check expeller	The movement of the expeller is hindered.	Check the expelling way for blocking pieces. Press button to reset.
8: ERROR Check step down	The transportation wheel for the basket transportation was not able to carry out one full rotation. Basket jammed inside the magazine?	Loosen jamming parts (slides) inside the basket magazine. Press button . Press button to expell basket downwards without being processed. Check basket for encrusted waste. Check slide for correct size.
9: ERROR Check pump	Pump drive was blocked.	Loosen the two screws with red rings to be able to loosen pump and dispenser needle. Remove pump and press button . Press button to check the pump drive. Does the drive clutch turn forwards and backwards? • If yes, install pump again. • If no, call autorized service personnel.

10: ERROR Check tran/slip	The transportation arm for lifting and lowering of coverglasses was hindered in its swivelling movement.	Check swivelling movement of the transportation arm for blocking part. Press button C.
11: ERROR Check grip finger	Carrier plate was not in its starting position when turning on the instrument.	Press button C.
	The grip finger for the removal of a slide signalled a wrong position during operation.	Please call authorized service personnel.
12: ERROR Lost slide	Incomplete removal of a slide from a basket.	Check for obstruction on slide basket (dryed coverslipping medium waste in slide basket?). Press button C and restart.
		Check slide for ragged sides and damaged corners. Press button C and start again.

2-11 Standard equipment

The coverslipping machine Cover-Tech CTM 6 will be supplied with the following accessories:

1 Power cord
1 Disposable syringe
2 Vacuum cups
1 Fan with housing
1 Compressing weight
1 Instruction manual

2-12 Additional equipment (optional)

	Cat. no.
Slide basket (19)	172540
Slide basket (30)	172550
Foot adapter f. slide basket 19	172830
Vacuum cup	172700
Adapter for HMS-MS/DS 50" (1 x 19 slides)	172560
Adapter for HMS-MS/DS 50" (2 x 19 slides)	172750
Adapter for HMS-MS/DS 100" (2 x 30 slides)	172570
Adapter for Medite (1 x 19 slides)	172760
Adapter for Leica Autostainer XL (ST5010) (1 x 30)	172580
Adapter for Leica ST 4040 (1 x 19)	173120
Adapter for Shandon Varistain 24.4 (1 x 30 slides)	172590
Adapter for Shandon Varistain 24-4 (2 x 19 slides)	172920
Adapter for Shandon Varistain XY (2 x 30 slides)	172600
Adapter for Sakura DRS-601	172940
Adapter for Combi-Tech	172610
Adapter for manual staining f. 30 baskets	172930
Adapter for manual staining f. 19 baskets	173070
Disposable syringe	261850

Part 3 Theory of operation

One or two slide baskets containing slides are inserted into the basket magazine. Coverglasses (40, 50, 55 or 60 mm) are loaded into a magazine for coverglasses on the right side of the basket magazine.

The instrument has a horizontal sledge that withdraws slides from the basket and introduces them again in the opposite direction. A vertical step down mechanism transports the slide basket downwards by one slide position each. The motor-driven coverslipping unit carrying the dispenser as well as the vacuum cup holder is another main part of the instrument. Moreover, the instrument is equipped with a pump drive for transporting the coverslipping medium.

The coverslipping unit carries out a circular movement of 180° from its home position into a middle position. While in this position, the horizontal carrier moves to the inner or outer side. The device is designed so that the dispenser needle and the vacuum cups have the same distance as the slides and the coverglasses.

When the carrier moves from its starting position to the inner position, the lowest coverglass is pushed out of the coverglass magazine. At the same time, a slide is pulled out of the slide basket by means of the grip finger.
Simultaneously with the carrier movement to the inner side, the pump is operated. While the slide is now withdrawn, coverslipping medium is put in shape of a line onto the slide
To carry out this movement a pneumatic cylinder is activated, the vacuum and the pressure side of which are connected with corresponding valves.

Now the coverslipping unit moves in its picking-up position for coverglasses. In its end position, the vacuum cup gets in contact with the coverglass. Then the vacuum valve opens and the coverglass is lifted via the vacuum cups.

Now the coverslipping unit moves back by 180° into its lowering position. This way, the coverglass is positioned exactly above the coverslipping medium on the slide.
A stepping-motor controlled slowly downward movement is carried out. This way, the coverglass is positioned slowly onto the specimen. This downward movement starts on the lower end and is supported by a spring-loaded bolt to have possible bubbles removed.

At the end of this process, the pressure valve is openend as well, to remove any remaining vacuum and blow away any glass dust from the vacuum cup. The coverslipping unit moves upwards in its middle position. Then the coverslipped slide covered with a coverglass is moved again in its shelf in the basket. The next coverglass will fall into the cavity.

The step down mechanism carries out one revolution. This way, the next slide can be taken by the grip finger and the coverslipping process can be continued.

If there is no slide in the basket shelf, a microswitch on the grip finger recognizes this. Another step down is carried out. This movement continues until further slides are coverslipped or the entire basket has been processed completely.
In this case, it will be recognized and the slide basket is expelled by another drive and can be removed.

Part 4 Working with the COVER-TECH CTM 6

After having finished working with the CTM 6, the vacuum cup should be checked daily for glue rests and/or damage. Glue can easily be removed when it is dry.

Daily remove the solvent conatiner and clean it with a solvent matching the coverslipping medium (e.g. Xylene). When doing so, please note that the movable part inside the container can be moved slightly and that its function is not affected by glue rests.
The dripping tray behing the solvent container should also be removed and cleaned daily.

Check the transportation sledge and the coverglass magazine for possible broken glass and clean it.

Remove the black bottom insert in the output area and clean it in regular intervals.

In case coverslipping medium is spilled while refilling it, the entire pump for the coverslipping medium must be removed and cleaned. The areas below and behind the pump are now accessible and can be cleaned easily (see part 5-1, dismounting the pump).

Regularly check and clean the two bar-shaped guides.

Regularly check the mechanism for the grip finger for smooth running to avoid malfunctions which are due to debris.

After having finished working or cleaning processes, reset the instrument into its starting position via button C. Please note that the dispensing needle is placed in the properly filled solvent container.

Part 5 Maintenance

5-1 Dismounting the pump, the dispenser and the vacuum cup holder

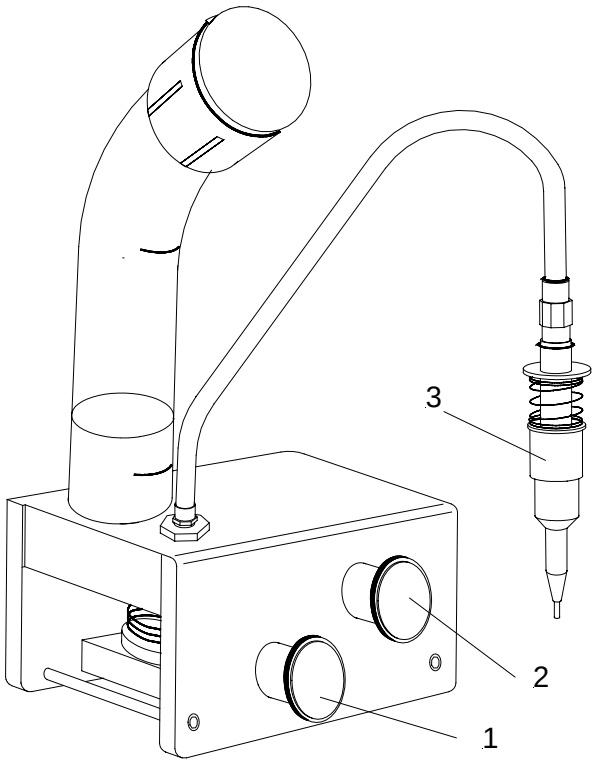


Fig. 16

Lift the black bottom insert (fig. 17) upwards out of the pins and remove it.

For cleaning and maintenance purposes remove the pump. For this, loosen the two red marked screws (fig. 16.1 and 16.2). The two screws can be loosened manually without any special tools. To remove the dispenser to the side, press the black plastic ring above the spring.

Caution:
The container for the coverslipping medium (fig. 16) must not be removed upwards. Do not lift the pump unit by the glass medium container or exert force to avoid damage.

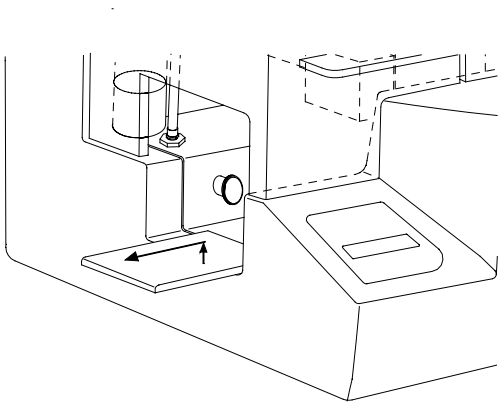


Fig. 17

5-2 Maintenance

Annual routine maintenance

To secure the coverslipping quality and functioning of your Cover-Tech CTM 6, it is recommended that a routine maintenance be performed by a trained service technician once a year.

Service contract

MICROM International GmbH offers a service contract which guarantees that your instrument is always in a perfect condition. For more information, please contact the nearest MICROM sales office.

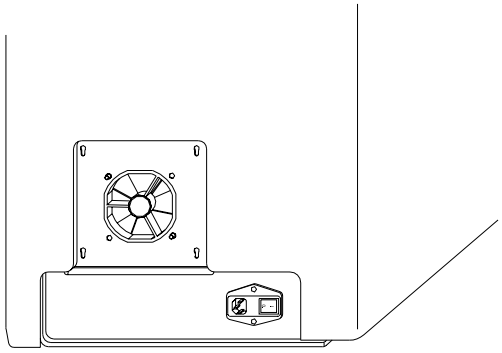


Fig. 18

Exchange of fuses

Exchanging the fuses is possible without opening the housing of the instrument.

The two fuses together with the connection for the power cord and the main switch are placed in the mains plug unit (fig. 18).
The mains plug unit can be opened by means of a screwdriver. Then remove the fuses and check them. When re-installing the fuses, please note that they are inserted correctly.

Part 6 Cleaning and care

6-1 Cleaning

Carefully clean the instrument daily to guarantee optimal functioning and best coverslipping quality.

Cleaning agents

Mild household cleaners can be used to clean the instrument. Do not use aggressive cleaners or solvents, as the paint and plastic parts can be affected.
Clean the dispenser as well as the needle and the horizontal carrier with a solvent matching the embedding medium.

How to clean the instrument

Daily clean the vacuum cups with a pad or an alcohol soaked cloth. If necessary, replace the vacuum cups.

6-2 Disposal of the instrument after final shutdown

After the final shutdown of the instrument, we recommend to contact a local recycling company for the disposal according to the national applicable regulations.

To be applied in the countries of the European Union and other European countries with a separate collecting system within the waste management.

The marking of the product and/or the respective literature indicates that, after its final shutdown, it must not be disposed of together with ordinary domestic waste.

- Please dispose of your instrument separately from other waste to not harm our environment and/or human health by uncontrolled waste disposal.
- Recycle your instrument to support the sustainable recycling of material resources.

- **Industrial users** should contact their suppliers and observe the conditions of the contract. This product must not be disposed of together with other commercial waste.

- **Please contact your supplier!!**