

# Tegramin-25/-30

Instruction Manual



Manual No.: 16037001

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### **FCC Notice**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this product not expressly approved by Struers A/S could cause harmful radio interference and void the user's authority to operate the equipment.

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Always state *Serial No* and *Voltage/frequency* if you have technical questions or when ordering spare parts. You will find the Serial No. and Voltage on the type plate of the machine itself. We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:

**Instruction Manuals:** Struers Instruction Manuals may only be used in connection with Struers equipment covered by the Instruction Manual.

**Service Manuals:** Struers Service Manuals may only be used by a trained technician authorised by Struers. The Service Manual may only be used in connection with Struers equipment covered by the Service Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to change without notice. The manual may mention accessories or parts not included in the present version of the equipment.

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## **Tegramin-25/-30**

### **Safety Precaution Sheet**

#### **To be read carefully before use**

1. The operator(s) should be fully instructed in the use of the machine, any connected equipment and accessories and the applied consumables according to the relevant Instruction Manuals and Material Safety Data Sheets.
2. The machine must be placed on a safe and stable table with an adequate working height and which is able to carry at least 91 kg / 200 lb. All functions on the machine and any connected equipment must be in working order.
3. Operators should ensure that the actual voltage corresponds to the voltage on the back of the machine. The machine must be earthed. Follow the local regulations. Always turn the power off and remove the plug or the cable before opening the machine or installing additional components.
4. Connect only to cold water. Make sure that the water connections are leak-proof and that the water outlet is working.
5. Struers recommend that the mains water supply is shut off or disconnected if the machine is to be left unattended.
6. Consumables: only use consumables specifically developed for use with this type of materialographic machine.  
Alcohol based consumables: follow the current safety rules for handling, mixing, filling, emptying and disposal of the alcohol-based liquids.
7. Keep clear of the rotating disc and the specimen mover during operation. While grinding manually, be careful not to touch the grinding disc. Do not attempt to collect a specimen from the tray while the disc is running.
8. Keep your hands clear of the specimen holder or specimen mover plate when moving them downwards.
9. When working at machines with rotating parts care has to be taken that clothes and/or hair cannot be caught by the rotating parts. Appropriate safety clothing must be used.

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- 10.** If you observe malfunctions or hear unusual noises - stop the machine and call technical service.
- 11.** The machine must be disconnected from the mains prior to any service. Wait until residual potential on the capacitors is discharged.
- 12.** Do not cycle mains power more than once every three minutes. Damage to the drive will result.

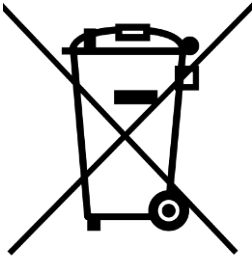
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The equipment should only be used for its intended purpose and as detailed in the Instruction Manual.


The equipment is designed for use with consumables supplied by Struers. If subjected to misuse, improper installation, alteration, neglect, accident or improper repair, Struers will accept no responsibility for damage(s) to the user or the equipment.

Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

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## **Disposal**

Equipment marked with a WEEE symbol  contain electrical and electronic components and must not be disposed of as general waste.

Please contact your local authorities for information on the correct method of disposal in accordance with national legislation.



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## 1. Getting Started

### Checking the Contents Tegramin-25/ -30

In the packing box you should find the following parts:

- 1 Tegramin-25 or Tegramin-30  
(Microprocessor controlled table top machine for automatic grinding, lapping and polishing of all materials)
- 2 Mains cables
- 1 Water inlet hose 19mm/ 3/4" (2 m)
- 1 Filter gasket
- 1 Reduction ring with gasket 3/4" to 1/2 "
- 1 Water outlet hose ø40/ 1 1/2" (1.5 m)
- 2 Hose clamps
- 1 Connection piece (p6 to 1/8")
- 1 Allen key w. cross handle 6x150 mm
- 1 Set of Instruction Manuals

### Unpacking Tegramin

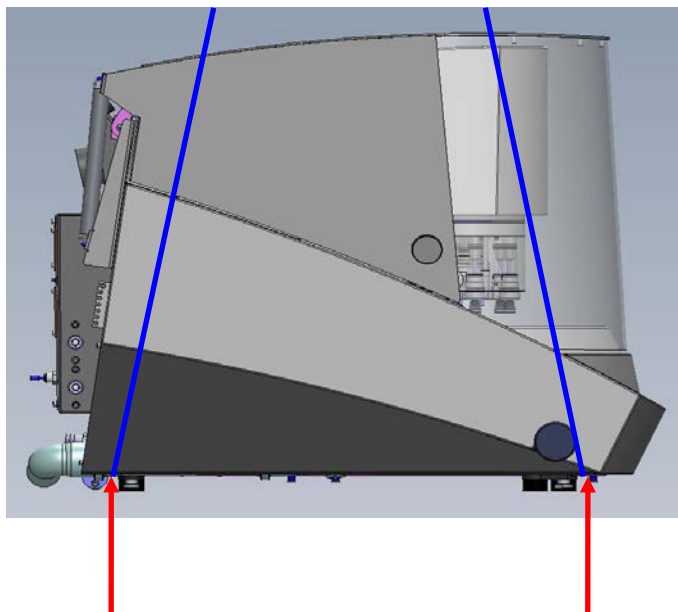
**Important**

**Do not** lift Tegramin using the light grey body.  
Always lift from underneath the machine.

A crane and 2 lifting straps are required to lift Tegramin off the shipment pallet.

Before lifting Tegramin into position:

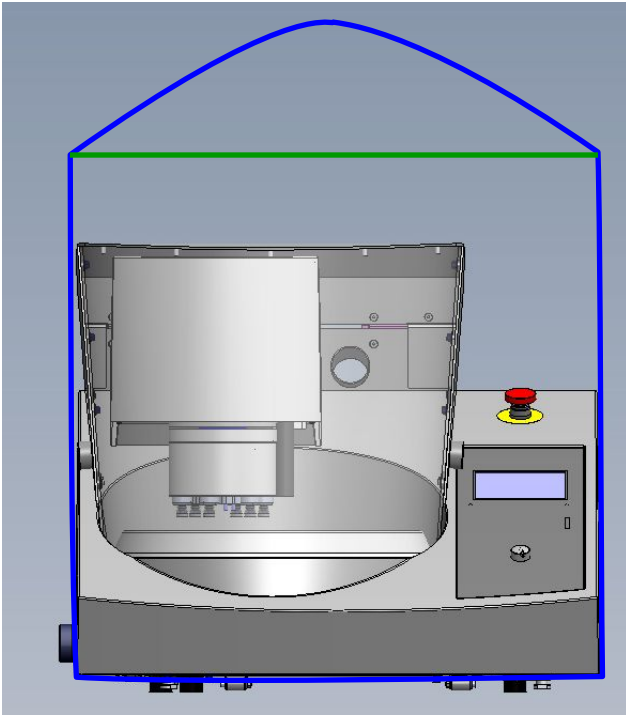
- Carefully open and remove the sides and the top of the packing crate.
- Remove the metal brackets securing Tegramin to the pallet (a 4 mm Allen key is required to remove the 8 screws that secure the metal brackets).
- Place the two lifting straps under Tegramin.
  - Position the straps under Tegramin, so that they are on the outer side of the feet/rollers.



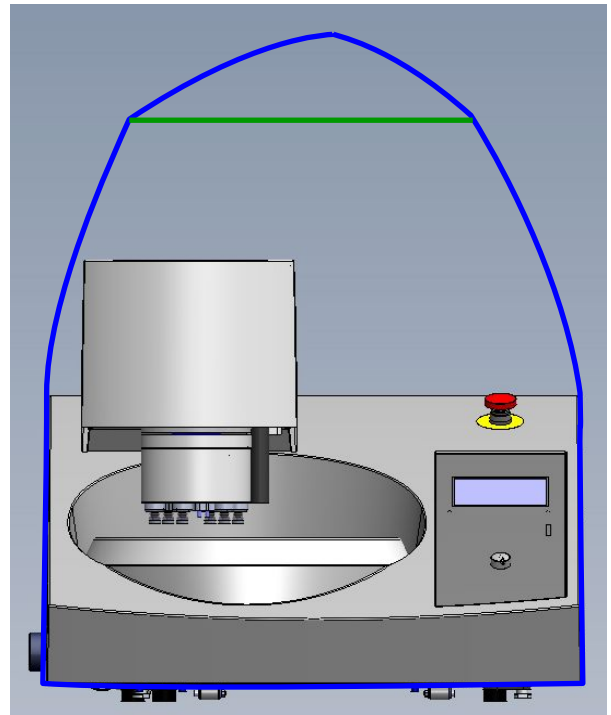
Position straps here

Position straps here

- Use straps which are long enough so that they do not place stress on the cover (use straps of approx. 3-3½ m in length). A lifting bar is recommended so that the two straps are kept apart below the lifting point.



Tegramin with cover:  
Ensure that the lifting straps  
are held away from the top cover



Tegramin without cover:

- Lift Tegramin onto the table.
- Lift the front of Tegramin and carefully move into place using the rollers.

**Important**  
**Do not** lift Tegramin using the light grey body.  
Always lift from underneath the machine.

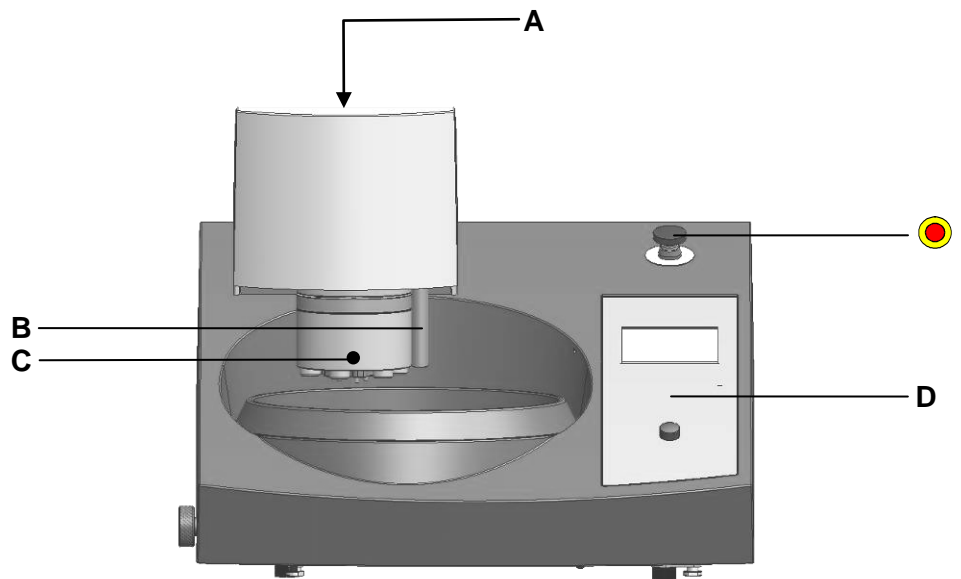
### Placing Tegramin

- Place Tegramin on a steady table with an adequate working height.  
The table must be able to carry at least 91 kg / 200 lb.
- Check that the Tegramin is resting securely with all 4 rubber feet on the table.
- The machine must be close to the power supply, water mains and water outlet facilities.
- Slide the piece of cardboard to the right.
- Remove the screw holding the transport lock on the cone shaft.
- Press the black release button and remove the transport lock.


## Getting Acquainted with Tegramin

Take a moment to familiarise yourself with the location and names of all the Tegramin components:

**Please Note,**  
The following illustrations are of Tegramin versions without a cover.  
Installation and operation of Tegramin versions with or without a cover  
will be identical.  
Covers are also available as an optional accessory.

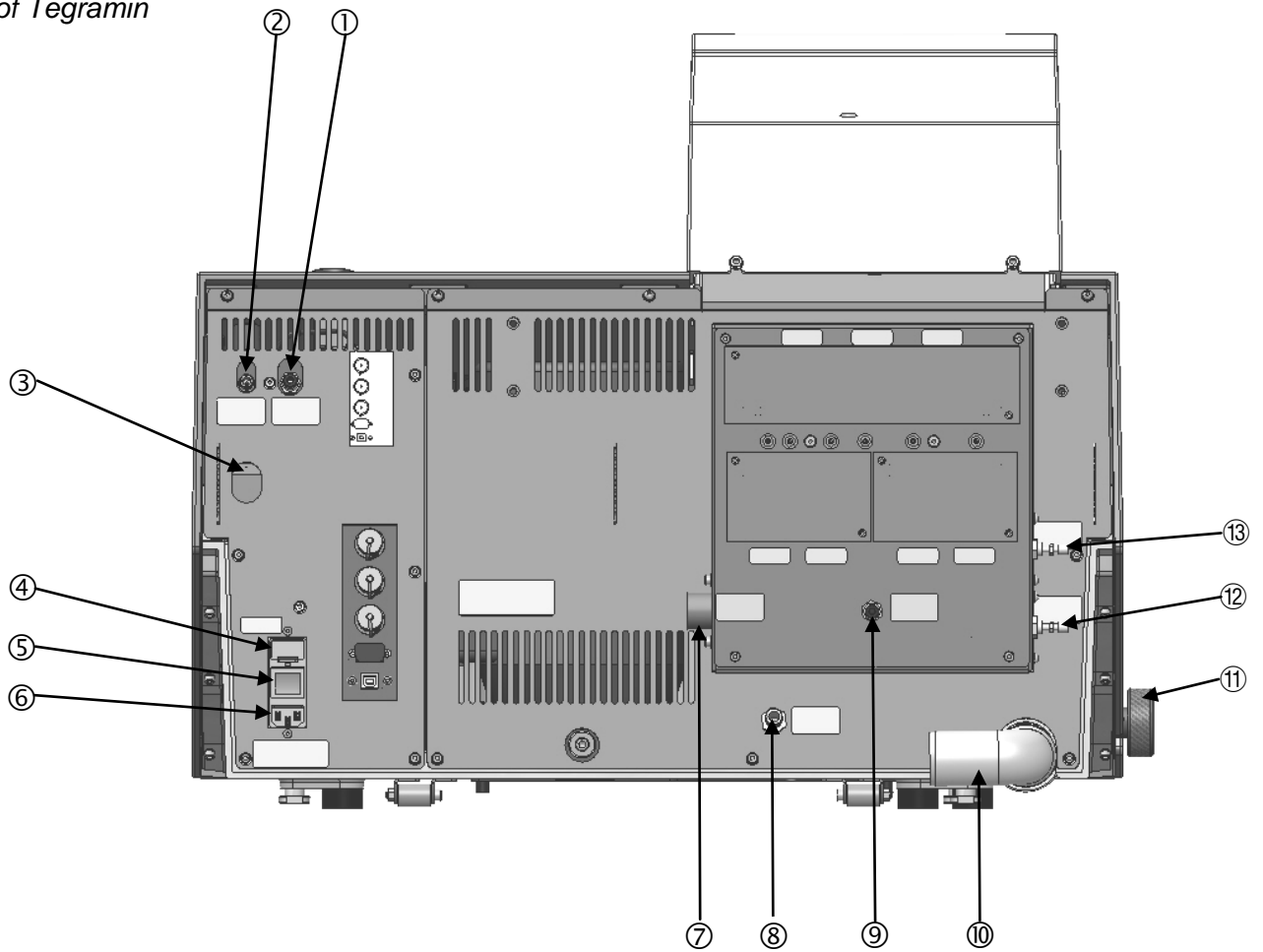


- A** Adjustment screw for the vertical alignment of the specimen mover plate
- B** Dosing block with nozzles
- C** Button for release of specimen holder/ mover plate
- D** Front panel control(s)

-  **Emergency Stop**
  - Push the red button to stop
  - Turn the red button clockwise to release

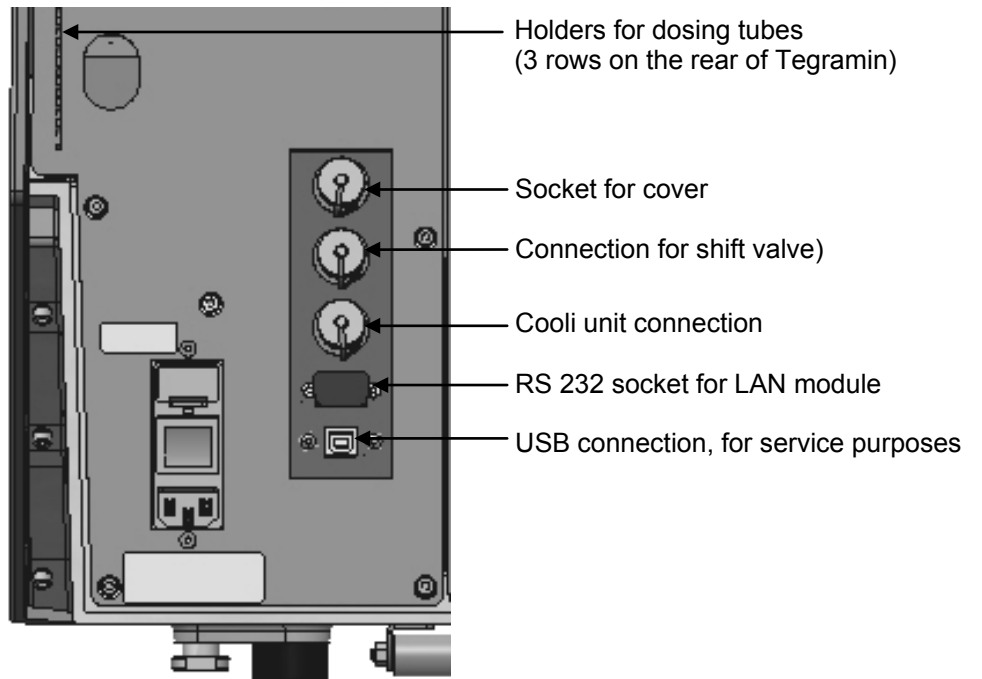
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*Rear of Tegramin*



- ① Air outlet for shift valve
- ② Compressed air inlet
- ③ Release outlet valve from water/oil filter for compressed air
- ④ Fuses
- ⑤ Main switch
- ⑥ Mains connection
- ⑦ Water inlet (mains water 3/4")
- ⑧ Water inlet (from Cooling Unit)
- ⑨ OP module, flushing water
- ⑩ Water outlet pipe
- ⑪ Water valve, manual
- ⑫ Throttle valve, disc cooling
- ⑬ Throttle valve, flushing water for OP

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## Supplying Water

Water for wet grinding may be supplied from the water mains or a Recirculation Cooling Unit (instructions on the next page).

### Connection to Water Mains

**IMPORTANT**

The cold water supply must have a head pressure in the range 1 – 10 bar (14.5 – 145 psi).

**Tip**

With new water pipe installations, leave the water to run for a few minutes to flush any debris from the pipe, before connecting to Tegramin.

- Mount the 90° end of the inlet hose onto the water inlet on the back of Tegramin (see Getting Acquainted with Tegramin):
  - Insert the filter gasket in the coupling nut with the flat side against the pressure hose.
  - Tighten the coupling nut completely.
- Mount the straight end of the inlet hose on the water mains tap for cold water:
  - If required, mount the reduction piece with gasket on the water mains tap and tighten the coupling nut completely.

### Connection to Water Outlet

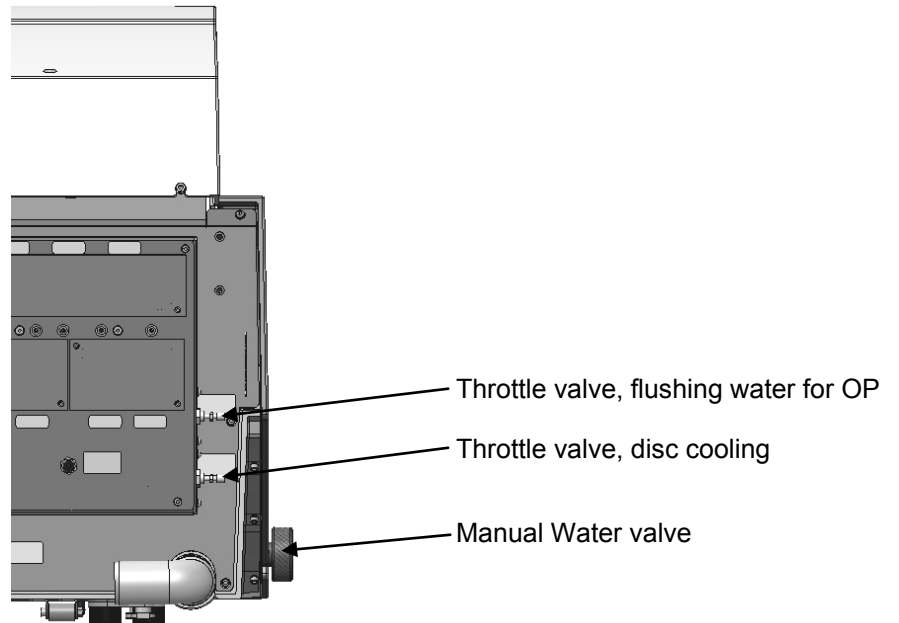
- Mount the outlet hose onto the water outlet pipe. (Lubricate with grease or soap to facilitate insertion.) Use a hose clamp for fastening.
- Lead the other end of the drain hose to the water outlet. Arrange the hose so that it slopes downward towards the drain throughout its length. Shorten the hose, if necessary.

**REMEMBER**

Make sure that the drain hose slopes downward towards the drain throughout its length and avoid sharp bends in the drain hose.

*Adjusting the Water Flow*

The flow of water can be adjusted using the manual water valve. Water flow for disc cooling and flushing after OP can be adjusted using the throttle valves.



## Connecting a Recirculation Cooling Unit

To ensure optimal cooling, Tegramin can be fitted with a Struers Recirculation Cooling Unit.

### **Oxide Polishing:**

A Shift Valve is REQUIRED when using a Recirculation Cooling Unit with Tegramin units running methods that include the dosing of oxide polishing suspensions -OP.

### **Note**

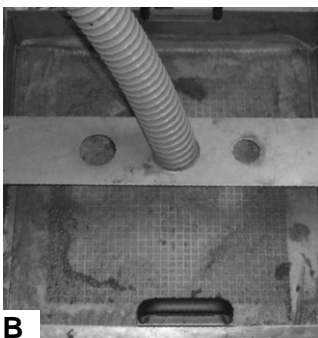
Before connecting the cooling unit to the Tegramin, follow the instructions in the Struers Cooling Units Instruction Manual to prepare it for use.

### Connecting the Water Inlet



- Take the hose delivered with the pump and remove the quick coupling from one end.
- Slide the hose clamp onto the hose and connect to the back of the Tegramin. Tighten the hose clamp.
- Connect the quick coupling on the other side of the inlet hose directly to the cooling unit's pump outlet (**A**).

### Connecting the Water Outlet



- Mount the water outlet hose onto the water outlet pipe. Use a hose clamp to secure the hose.
- Lead the other end into the mounting hole in the bracket on top of the static filter unit (**B**). Arrange the hose so that it slopes downward towards the drain throughout its length. Shorten the hose, if necessary.



*Connecting the Communication  
Cable*

- Connect the communication cable to the Cooli Control Box and then connect to the socket at the rear of the Tegramin.

**IMPORTANT**

Before connecting to power, check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine.

*Installing the Shift Valve  
(Accessory)*

**IMPORTANT**

When connecting Tegramin to both mains water AND the recirculation cooling unit you also must install the shift valve for the drain.  
Failure to do this may result in emptying or overflowing the recirculation cooling unit.

- With the outlet hose mounted onto Tegramin's water outlet pipe, mount the other end of the hose onto the pipe labelled *From Tegramin* on the shift valve.
- Mount a 1.5 m piece of hose onto the pipe marked *Cooli* and lead the other end to the recirculation cooling unit. Use a hose clamp for fastening.
- Mount the second 1.5 m piece of hose onto the pipe marked *Drain* and lead the other end to the drain. Use a hose clamp for fastening.
- Connect the blue compressed air hose to the air outlet on Tegramin and fit the other end to the shift valve, marked *Connect to Tegramin*.
- Connect the plug to the socket at the back of the Tegramin marked *Shift valve*.

**Note:**

The Shift Valve for Tegramin set includes some extra pieces not used for Tegramin-25/-30  
(1 short piece of hose, 1 reduction piece and 2 hose clamps)

**REMEMBER**

Make sure that the hoses slope downward throughout their length, from Tegramin to the shift valve and from shift valve to Cooli (or drain).  
Avoid sharp bends in the hoses. Shorten the hoses, if necessary.

## Compressed Air Connections

To connect compressed air:

- Mount the quick coupling on the compressed air hose and secure it with the hose clamp supplied.
- Connect the air inlet hose to the quick coupling and fit the other end into the compressed air inlet on Tegramin.

### **IMPORTANT**

The air pressure must be between 6 bar (87 psi) and 10 bar (145 psi).

### **Note:**

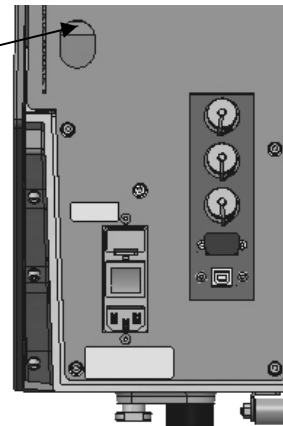
Tegramin requires a continuous flow of compressed air through the regulator valve – a faint hissing sound does not mean that there is an air leak.

## Emptying the Water / Oil Filter

Tegramin is fitted with a water / oil filter that removes excessive amounts of these substances from the compressed air supply. As a result of this, it is necessary to empty the filter periodically:

- Locate the release outlet valve at the back of the machine.
- Hold a cloth under the filter to retain any water released and press the release valve.

Release Outlet Valve



## Connection to an External Exhaust System

Tegramin with Cover  
(optional/accessory)

An exhaust system should be connected when using alcohol based suspensions or lubricants.

- Connect a 50 mm pipe to the outlet at the rear of the machine, on the left and connect to the exhaust system.  
Recommended capacity for exhaust system: 50m<sup>3</sup>/h / 1750ft<sup>3</sup>/h at 0mm water gauge.

## Supplying Power

Always remember to switch the power off when installing electrical equipment.



**DANGER!**

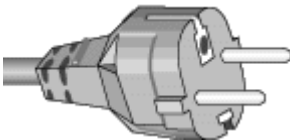
The machine must be earthed

### **IMPORTANT**

Check that the mains voltage corresponds to the voltage stated on the type plate on the back of the machine.

The Tegramin is shipped with 2 types of Mains cables:

### *Single-phase Supply*



The 2-pin (European Schuko) plug is for use on single-phase connections.

If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug. The leads must be connected as follows:

Yellow/green: earth  
Brown: line (live)  
Blue: neutral

### *2-phase Supply*



The 3-pin (North American NEMA) plug is for use on 2-phase power connections.

If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug. The leads must be connected as follows:

Green: earth (ground)  
Black: line (live)  
White: line (live)

### *Connection to the Machine*



Both cables are on the other end equipped with an IEC 320 cable connector that has to be connected to the Tegramin.

### **WARNING!**

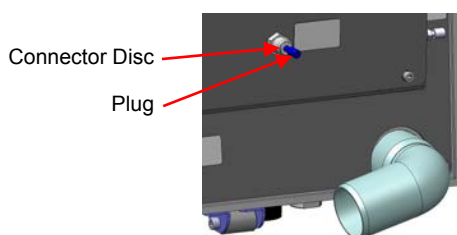
The output voltage from this cable is 200 – 240V and not 110V.  
DO NOT use this cable to connect equipment that use a 110V power supply. Failure to adhere to this may result in material damage.

### Mounting the Dosing Modules

- Remove the cover plates.
- Slide the dosing module(s) into the correct position at the back of Tegramin.
- Secure the module(s) with the attached screws.
- Connect the short piece of tube with the 90° angle and the clear tube to the connectors at the back of the Tegramin.
- Lead the long tubes from the pumps to the bottles of lubricant/abrasive and connect them to the nipple on top of the bottles.  
The tubes can be pressed into place in the dosing tube holders on the rear of Tegramin.



### OP dosing



When mounting a module with an OP pump:

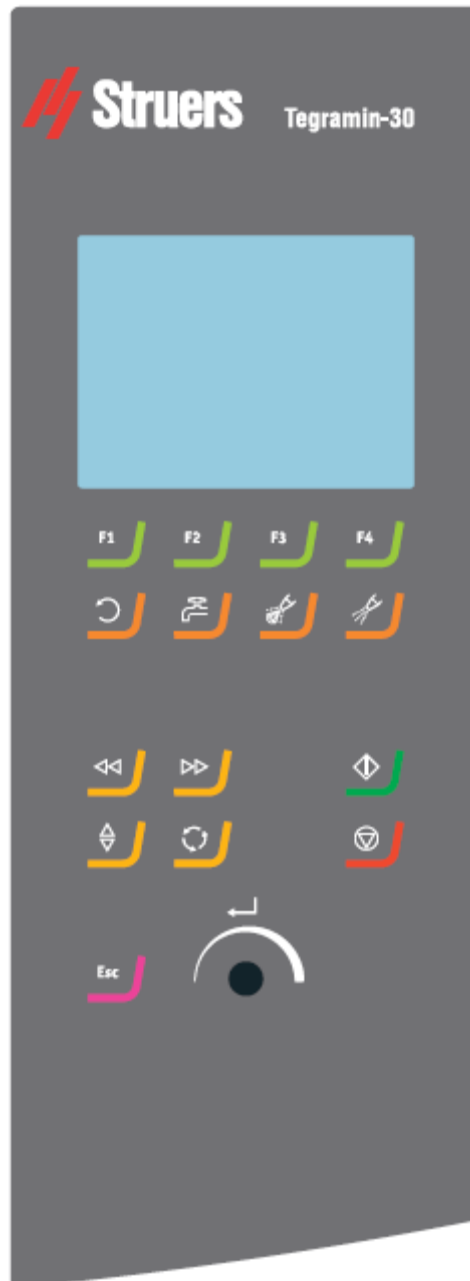
- Push the connector disc inwards and remove the blue plug from the OP Flush water connector.
- Lead the tube from the OP pump (Pump No. 7 in the picture), press the connector disc inwards and insert the tube into the connector.

**NOTE!**

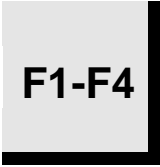
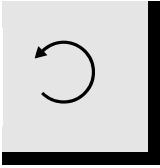

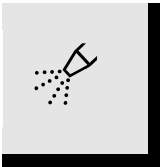

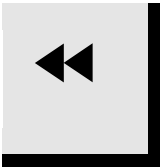
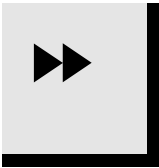
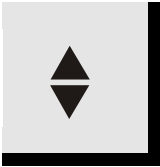
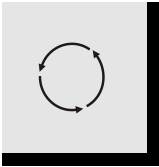
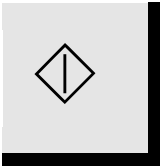
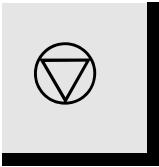
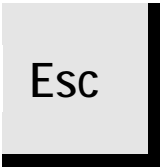
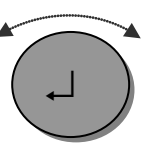
The tubes from the 2 DP-dosing modules are numbered 1/3 or 2/4. Depending on the position the dosing modules are placed in please remove the numbers that do not match, on both ends of the tube.

## 2. Basic Operation of Tegramin

### Front Panel



Front Panel Controls

	Key	Function		Key	Function
FUNCTION KEY		Controls for various purposes. See the bottom line of the individual screens.			
DISC ROTATION		Starts rotation of the disc.	WATER		Manual override - push button to apply water (applies water when no process is running). Push button again to stop applying water (water will automatically switch off after 5 min.)
LUBRICANT		Only active when dosing units are installed. Manual override – push button to apply lubricant from the doser bottle.	ABRASIVE		Only active when dosing units are installed. Manual override – push button to apply diamond suspension from the doser bottle.
LEFT		Moves the specimen holder head left.	RIGHT		Moves the specimen holder head right.
LOWER/ RAISE		Lowers & raises the specimen mover head when preparing single specimens or when adjusting positions of specimen mover plate or specimen holder.	ROTATE		Rotates the Specimen Mover Plate.
START		Starts the preparation process.	STOP		Stops the preparation process.
ESC		Returns to the Main Menu or aborts functions/changes.	Turn/Push Knob		Used for entering and changing steps and parameters. Combined cursor and enter key. Enables selected parameter values to be activated for editing. Saves the edited parameter values. Toggles when only 2 options available.

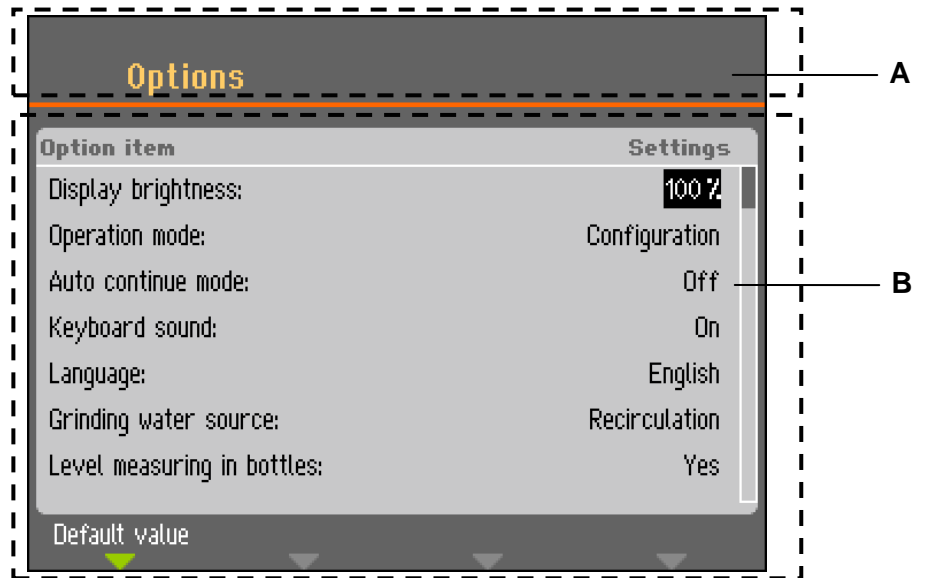
### Reading the Display

The display on the front panel provides different levels of status information. For example, when the machine is switched on using the Mains switch located at the rear of the machine, the display informs you about the physical configuration of the Tegramin and the version of software that is installed:



When operating the Tegramin, this display is the user-interface to Tegramin's software.

The display is primarily divided into 2 areas. The position of these areas and the information they contain are explained in the illustration below, which uses the *Options* menu as an example:



- A** Heading: this is a navigational aid, telling you where you are in the software's hierarchy.
- B** Information fields: these will be either numerical values or text fields, providing information associated with the process shown in the heading. The inverted text shows the cursor position.

### Manoeuvring in the Menu Structure

To select items in the menu:



Turn knob to select a menu, method group or a parameter.



Push knob to open or activate the selection.

**ESC** Press **Esc** to return to the Main menu.

### Acoustic Signals

When pressing a key, a short beep indicates that the command has been accepted, whereas a long beep indicates that the key cannot be activated at the moment.

This sound can be switched on or off in *Configuration* under *Options*.



## Software Settings

When switching Tegramin on for the first time, the *Select language* screen will appear (to change the language after this, refer to “*Changing the Language*”).

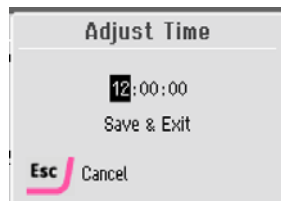


Turn knob to select the language you prefer.



Push knob to accept the language.

You will now be prompted to set the time.



Turn knob to select and to adjust the settings.



Push knob to accept the settings.

You will now be prompted to set the date.



Turn knob to select and to adjust the settings.



Push knob to accept the settings.



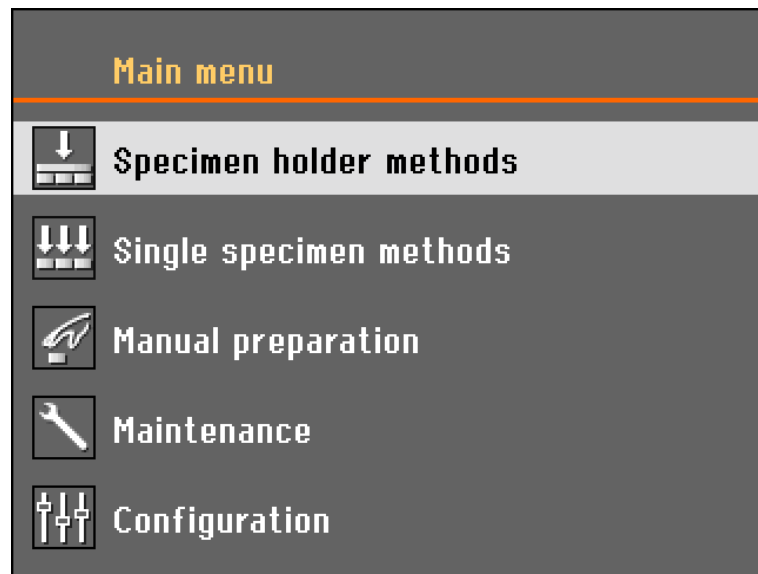
When Time and Date have been set, turn knob to select *Save and Exit*.



Push knob to *Save and Exit* (Save the settings and return to the *Main menu*).

The *Main menu* now appears in the language you have chosen.

During normal operation, immediately after start up, where the splash screen is displayed, the software goes to the screen that was used before the machine was switched off. Thus you can continue exactly where you left last time the machine was used.  
To go to the *Main menu*, use the **Esc** key. The *Main Menu* is the highest level in the menu structure. From this menu, you can enter all the other menus.



*Changing the Language*



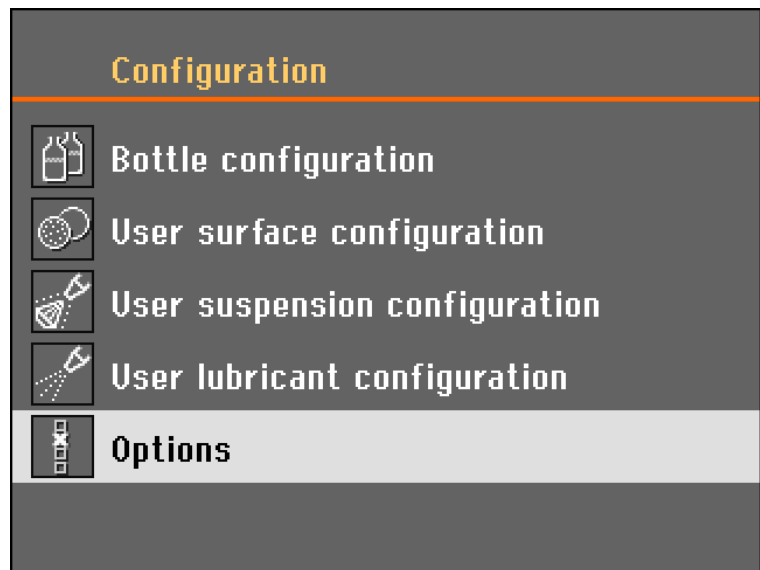
Turn the knob to select *Configuration*.



Push knob to activate the *Configuration Menu*.



Turn the knob to select *Options*

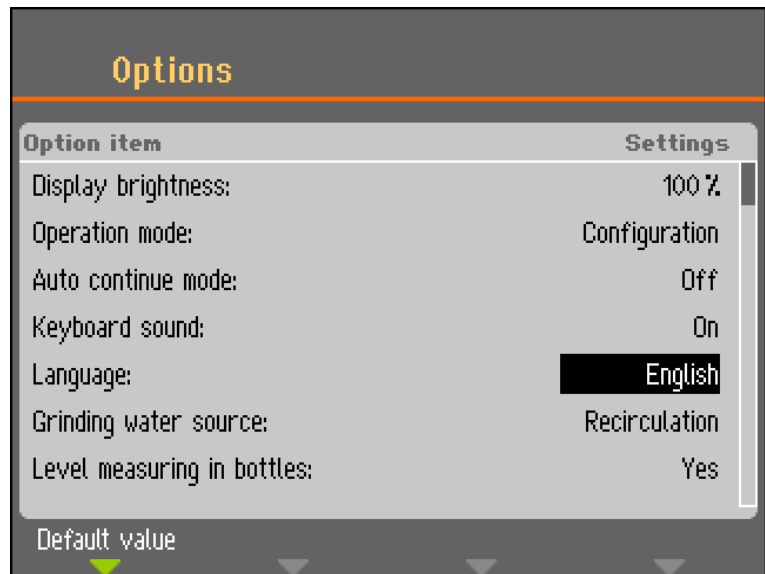


Push knob to activate the *Options Menu*.



Turn knob to select *Language*.





Push knob to activate the *Select language* pop-up menu.



Turn knob to select the language you prefer.



Push knob to accept the language.

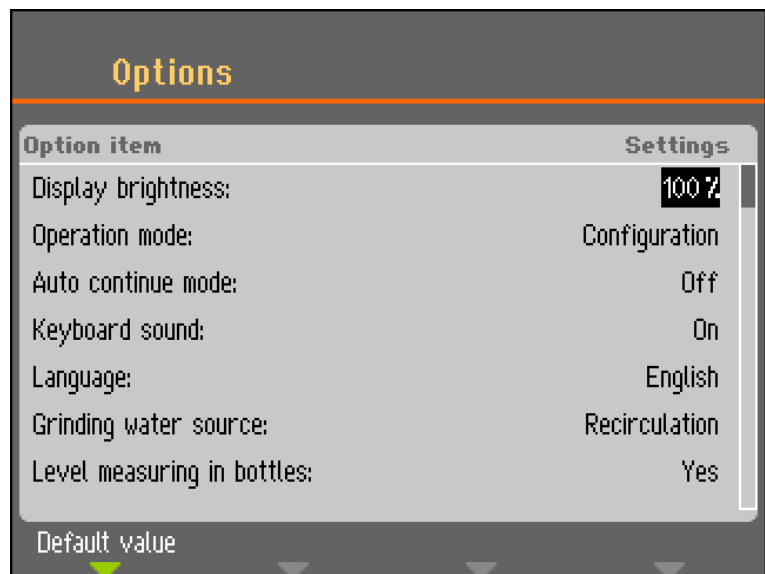
The *Configuration* menu now appears in the language you have chosen.

Check if there are any other settings that need changing in the *Options* menu. If not, Push **ESC** to return to the *Configuration* menu.  
Otherwise use the Turn/Push knob to select and change the required parameters.

### Editing Numeric Values



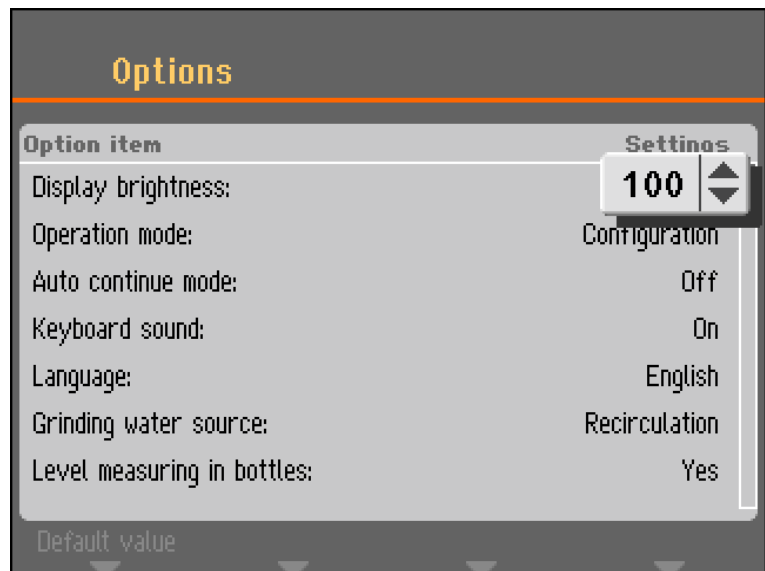
Turn knob to select the value to be changed, e.g. *Display brightness*:



Push knob to edit the value.



A scroll box appears around the value.



**Note:**

↓  
If there are only two options, the popup box is not displayed. Pressing the knob (Enter) will toggle between the 2 options.



Turn knob to increase or decrease the numeric value (or to toggle between the two options).

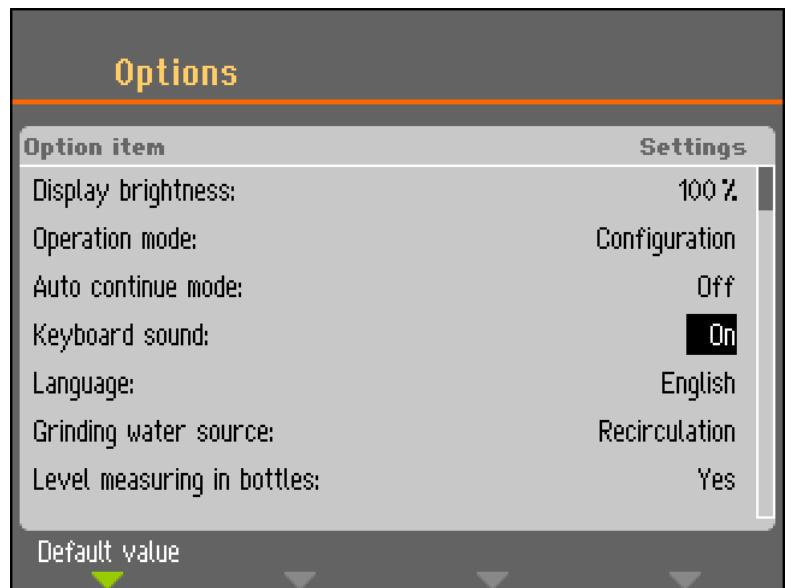


Push knob to accept the new value. (Pressing **Esc**, aborts the changes, preserving the original value.)

*Editing Alphanumeric Values*

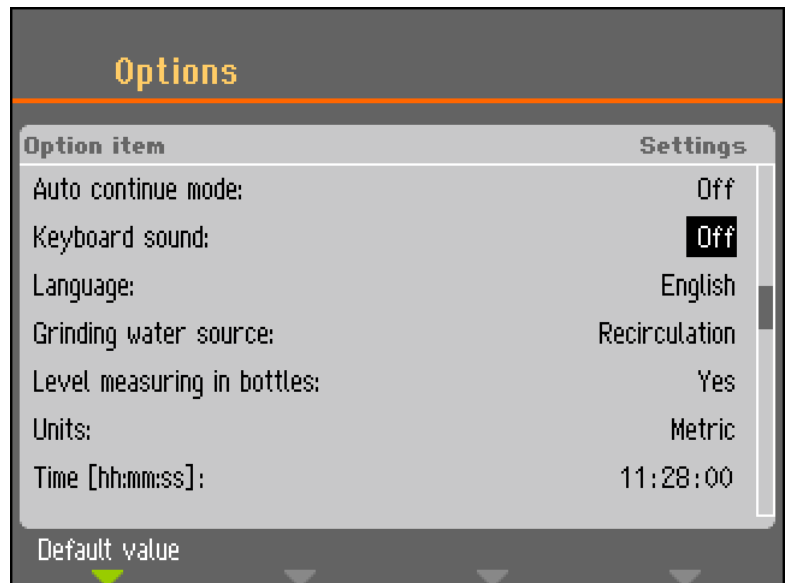


Turn knob to select the text value to be changed, e.g. *Keyboard sound:*




Push knob to toggle between the 2 options.





↓ **Note:**  
If there are more than two options, a popup box is displayed. Turn knob to select the correct option.

↓  
 Press **Esc** to accept the option and return to the previous menu  
Or turn knob to select and edit other options in the menu.

## Operation Mode

In *Operation mode* 3 different user levels can be set.

**Production:** Methods can be selected and viewed but no editing is possible.

**Development:** Methods can be selected, viewed and edited

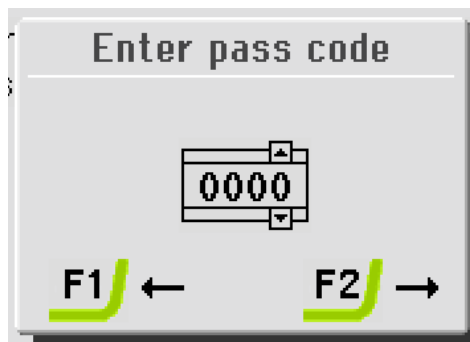
**Configuration:** Methods can be selected, viewed and edited and bottles can be configured.

## Changing Operation Mode

To change the operation mode, go to the *Configuration* menu and then the *Options* menu. Select **Operation mode** to get access to the *Operation mode* menu.

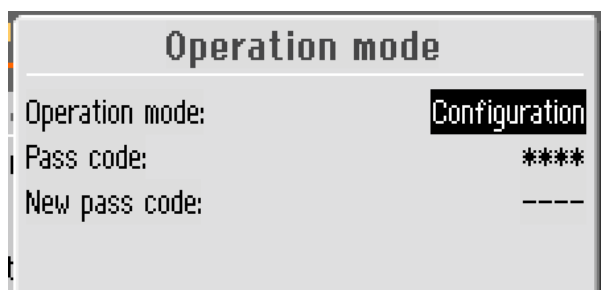


Push knob to select **Pass code**.



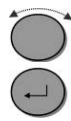
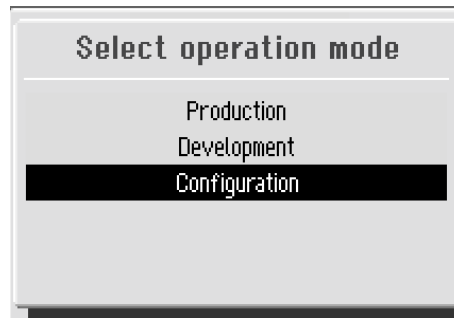
Use the F1 and F2 keys and the knob to enter the current pass code (The default pass code is '2750'.):

- Use the F1 and F2 keys to select digits (F1 moves to the left, F2 moves to the right).
- Turn knob to change the digits and press knob to enter the pass code.



Push knob to select **Configuration**.





Select the desired operation mode and push knob to confirm.

## New Pass Code

A New pass code can also be selected from the *Operation mode* menu.

### ***Please Note***

When a pass code is set the operator has 5 attempts to enter the correct pass code after which the Tegramin will be locked.  
Re-start Tegramin using the Main Switch  
then enter the correct Pass Code.

### ***Important!***

Remember to make a note of the new Pass code  
as settings can no longer be changed without the Pass code.

## Bottle Configuration

Before a preparation can be started, the bottles with suspensions and lubricants have to be configured.



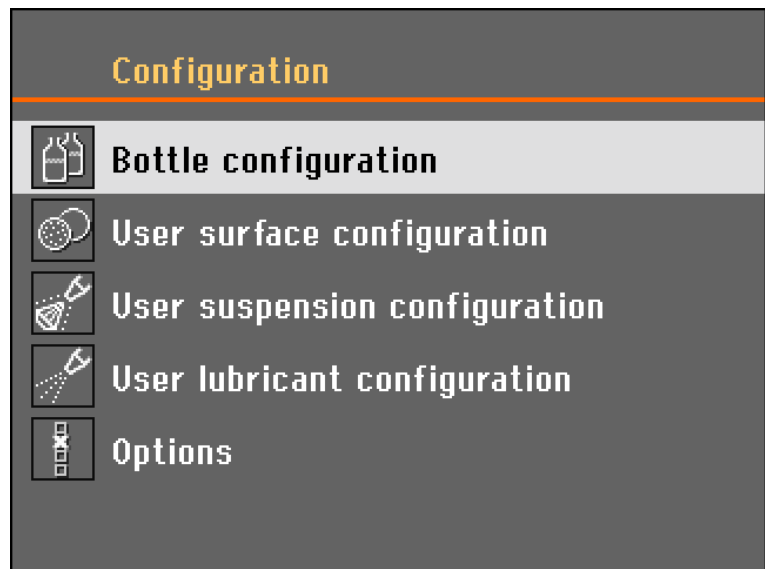
Turn the knob to select *Configuration*.



Push knob to activate the *Configuration Menu*.



Turn the knob to select *Bottle configuration*



Depending on the number of pump modules and pumps installed, from 1 to 7 configuration possibilities are displayed.

If a pump for OP-Suspension is installed this is always shown in position 7.



Turn knob to select the first bottle.





Push knob to toggle between *Suspension*, *Lubricant* or *None* (if no dosing bottle is connected).

If a bottle with diamond suspension is connected to pump 1, select *Suspension*.



**Bottle configuration**

No.	Susp./Lub.	Type	Remaining
1	Suspension	DP-Suspension, P 15 µm	200–250ml
2	None		Disabled
3	None		Disabled
4	None		Disabled
5	None		Disabled
6	None		Disabled
7	None		Disabled



- ↓
-  Turn knob to select *Type*.
-  Push knob to display the *Select suspension type* menu.

↓

**Select suspension type**

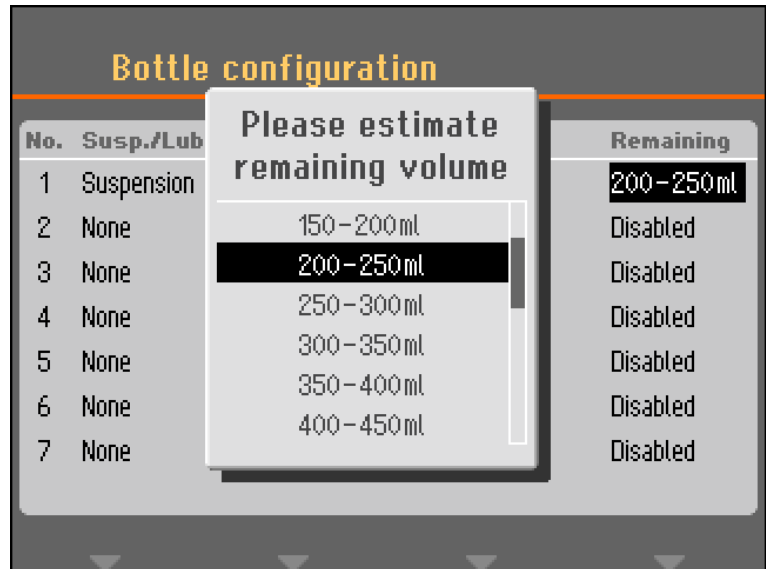
No.	Su	TYPE	ining
1	Sus	DP-Susp., P	250ml
2	Nor	DP-Susp., M	ed
3	Nor	DP-Susp., A	ed
4	Nor	DiaPro/DiaDuo	ed
5	Nor	User defined	ed
6	Nor		ed
7	Nor		ed

↓

- Select the correct type and grain size of the suspension you are using.
-  Push knob to save the selection.
-  Turn knob to select *Remaining*.



Push knob and a pop-up will appear.



Turn knob to select the approximate volume that is in the bottle and push the knob to save this value.

(This function requires that the parameter: *Level measuring in bottles* in the *Options* menu under *Configuration* is set to Yes.)



The amount of every suspension or lubricant used in the following preparations is automatically deducted from the remaining volume in each of the bottles and a message is displayed when the remaining volume gets too low.

Repeat the procedure for all of the following pumps / bottles until all bottles are configured correctly.



Bottle configuration			
No.	Susp./Lub.	Type	Remaining
1	Suspension	DiaPro All/Lar.	400-450ml
2	Suspension	DiaPro Largo	350-400ml
3	Suspension	DiaPro Plus	450-500ml
4	Suspension	DiaPro Nap-B	250-300ml
5	Suspension	DP-Suspension, P & µm	350-400ml
6	Lubricant	DP-Lubricant, Blue	350-400ml
7	Suspension	OP-S	850-900ml



**Esc** Press **Esc** until the Main menu appears.  
Tegramin is now ready to set up a preparation process.

## Preparation Process Setup

Tegramin-25 and -30 are designed for the preparation of most materials. In Struers Metalog Guide™ you will find a detailed description of grinding/polishing for automated mechanical specimen preparation.

Struers Metalog Guide™ offers preparation methods for the most common materials, based on a simple analysis of two key properties: hardness and ductility. Finding the right method is easy, including choice of consumables. Always consult Struers Metalog Guide™ on the Struers website for the correct preparation method for the actual specimens.

### **Metalog Guide™**

A complete guide to materialographic specimen preparation.  
[www.struers.com/KNOWLEDGE/Metalog Guide](http://www.struers.com/KNOWLEDGE/Metalog%20Guide).

## Mounting a Disc

### **Important!**

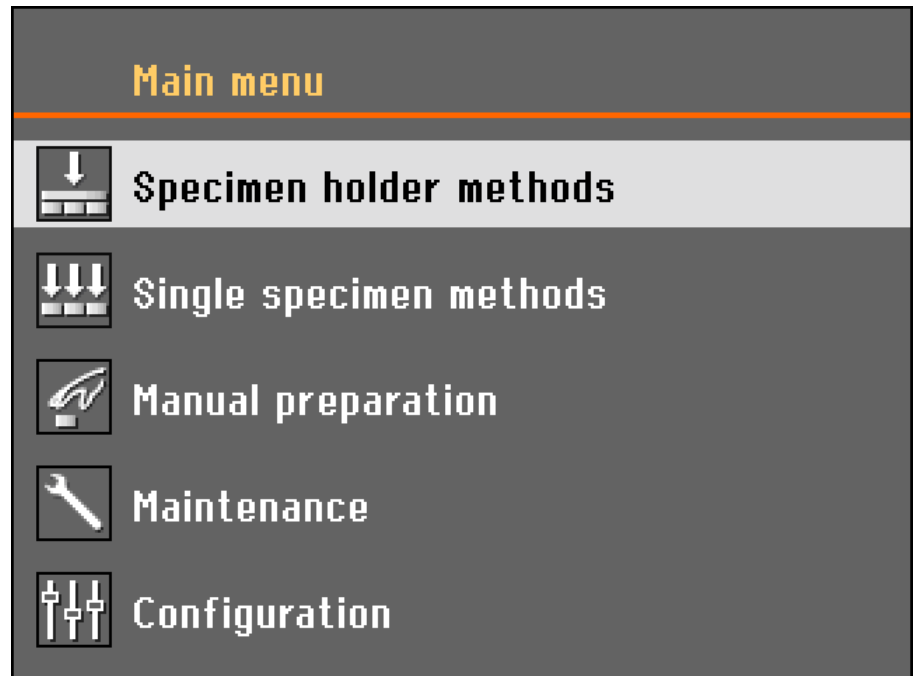
Ensure that the cone of the MD-Disc and the counterpart on the Tegramin are clean.

Make sure that bowl liner is clean and positioned correctly.  
Place the MD-Disc carefully on the Tegramin.

- Place the cone disc carefully on the driving pin and rotate it slowly until it is safely engaged.

### Selecting a Preparation Mode

Three different preparation modes can be selected



- Specimens can be clamped in specimen holders and prepared
- Specimens are prepared as single specimens
- Specimens can be prepared manually

Select the appropriate preparation mode by turning the knob and activate the selection by pushing the knob.

The first screen displays the Method groups. On a new machine only the Struers Metalog Guide Methods, Group 01 and New Group are shown.

The contents of the Method Groups are identical, no matter if *Specimen holder methods* or *Single specimen methods* is selected. A method group or method created in one selection is automatically created in the other selection as well.

All method parameters are exactly the same when a method is created initially, except for the force. The relation between single specimen force and specimen holder force is 1 to 6, i.e. 30 N in single specimen mode will be 180 N in specimen holder mode and vice versa.

However, when a method parameter such as time or force is changed later on, the other method will **not** be updated with the new values. This will allow for individual modifications due to specimen size and/or number.

If a preparation surface or suspension is changed in a method, this **will** be reflected in the other method.

#### Selecting a Preparation Method



Turn knob to select either *Specimen holder methods* or *Single specimen methods*.



Push knob to open the group view.

#### **Important!**

A small icon in the top right corner shows if *Specimen holder methods* or *Single specimen methods* are selected.



Indicates *Specimen holder methods*



Indicates *Single specimen methods*

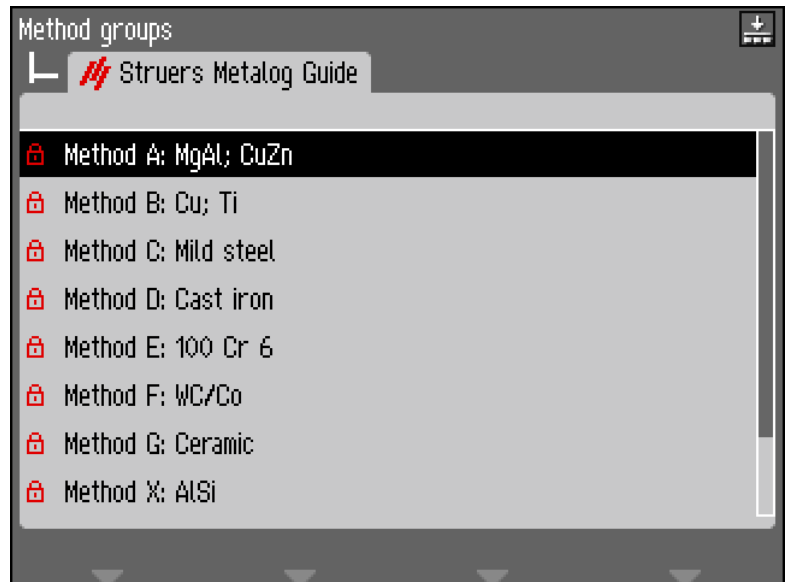




Turn knob to select a Method group.



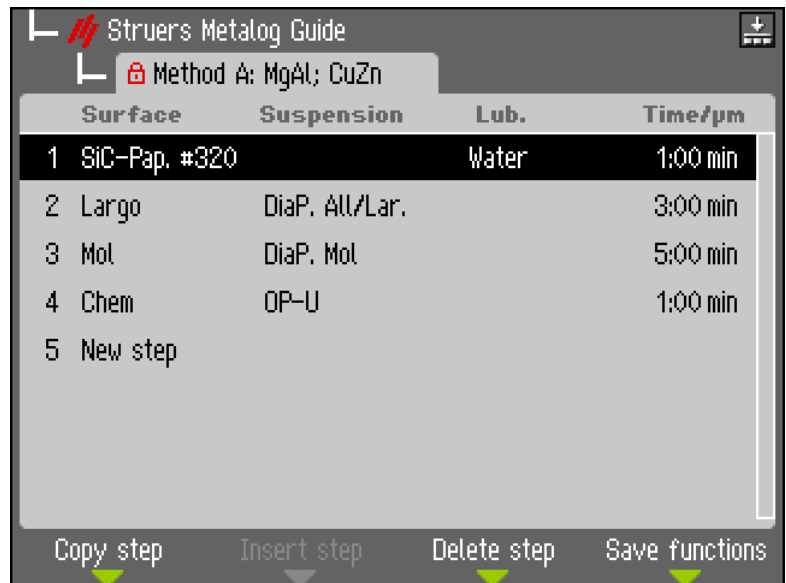
Push knob to open the method view.



Turn knob to select a Method.



Push knob to open the step view.



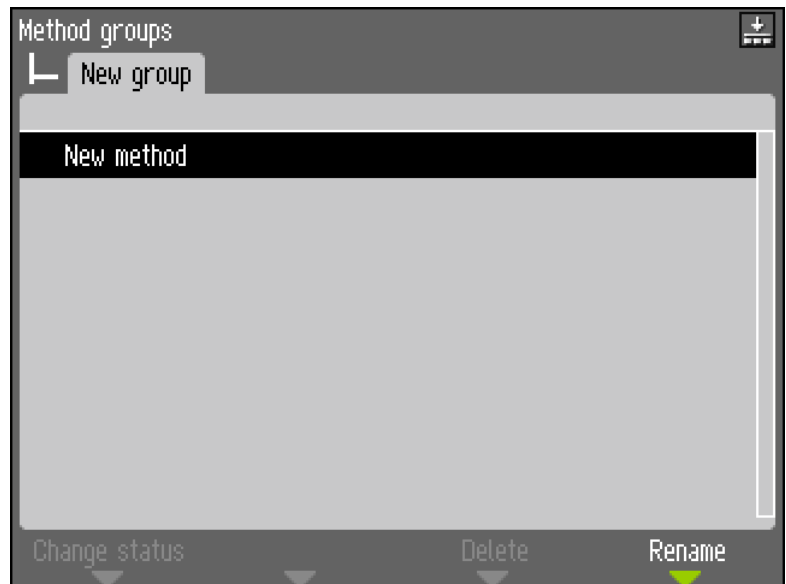
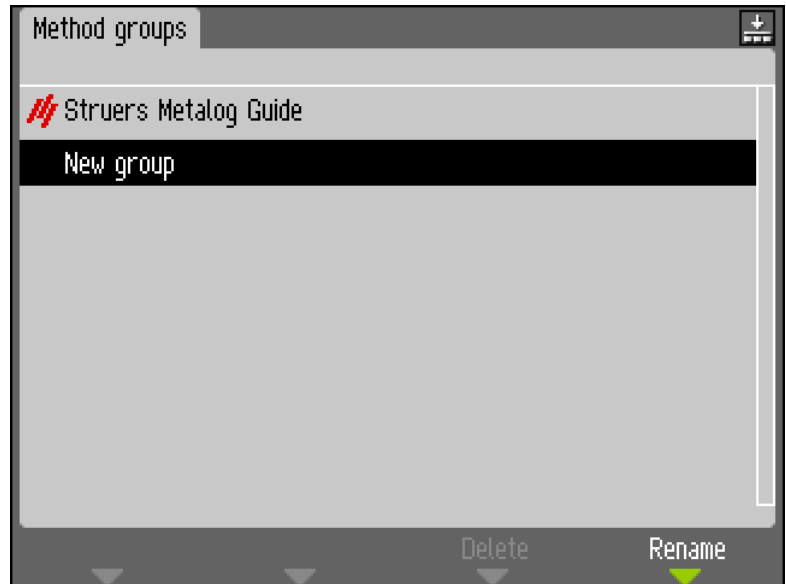
The screenshot shows the 'Struers Metalog Guide' software interface. At the top, there is a title bar with a red double-slash icon and the text 'Struers Metalog Guide'. Below the title bar, there is a sub-header 'Method A: MgAl; CuZn'. The main content is a table with four columns: 'Surface', 'Suspension', 'Lub.', and 'Time/µm'. The table contains five rows of data. The first row is highlighted in black. At the bottom of the interface, there are four buttons: 'Copy step', 'Insert step', 'Delete step', and 'Save functions', each with a small green downward-pointing triangle below it.

	Surface	Suspension	Lub.	Time/µm
1	SiC-Pap. #320		Water	1:00 min
2	Largo	DiaP. All/Lar.		3:00 min
3	Mol	DiaP. Mol		5:00 min
4	Chem	OP-U		1:00 min
5	New step			

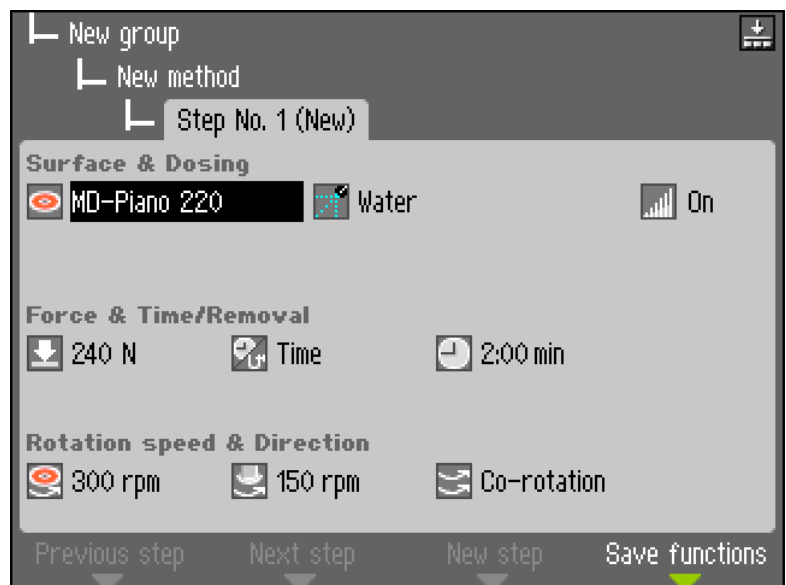
*Creating a Preparation Method*

All parameters can be changed to optimise the preparation method.

Use the knob to select a *New method*.



Push knob to open the step and display the parameter view.



Default settings for a typical preparation process are already selected. e.g.:

Step No. 1 is designed to be a plane grinding step.

Step No. 2 is designed to be a fine grinding step.

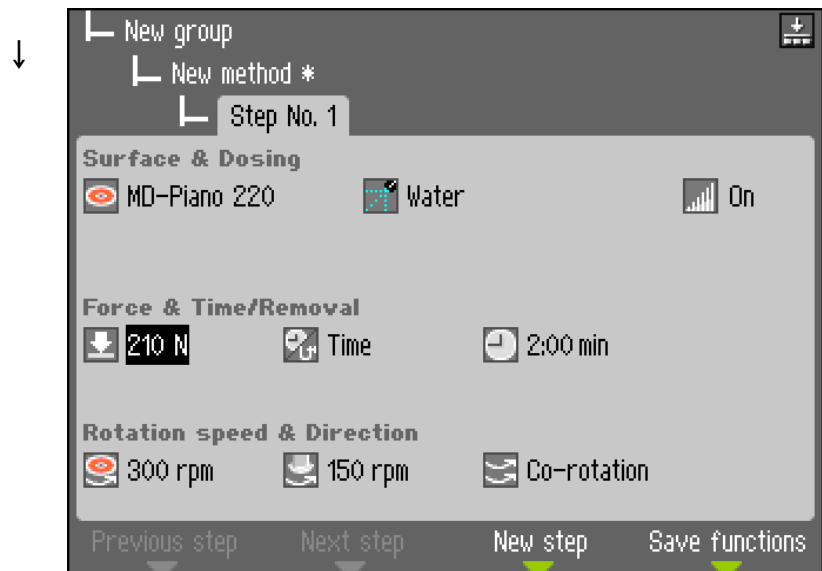
Step No. 3 is designed to be a polishing step.

Change the settings to optimise the preparation method.

↓ Use the knob to select the parameter to be edited e.g *Force & Time/ Removal*.



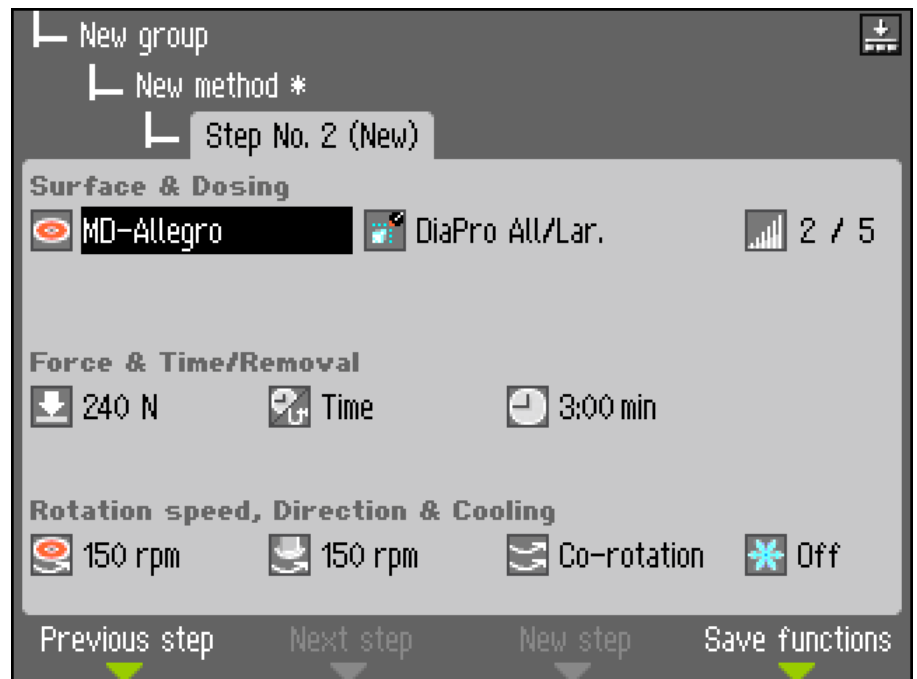
↓ Use the knob to edit the parameter/ value and push the knob to confirm the new value. (Pressing **Esc**, aborts the changes, preserving the original value.)



An asterisks \* next to the method name indicates that a change has been made

After the step has been modified,

**F3** Press **F3** *New step* and step 2 is displayed – *Step No. 2*.

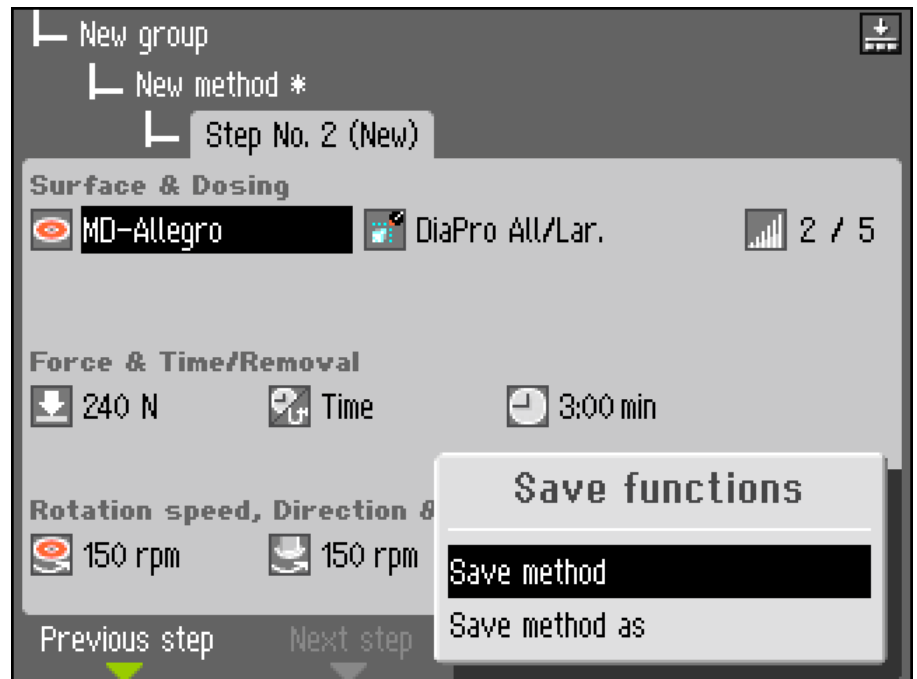


**Important!**

**F3** *New step* is only available after at least one modification of the current preparation step.

When all necessary preparation steps have been created and modified correctly, the method should be saved.

**F4** Press **F4** *Save* and a pop-up is displayed.



Select *Save method* to save the method, with the current name and current method group.

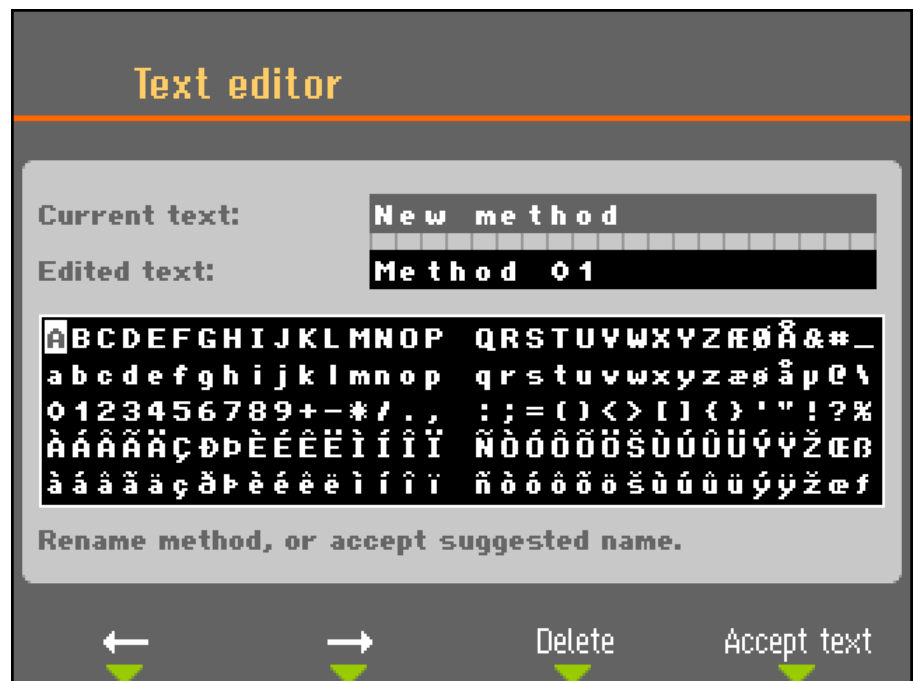
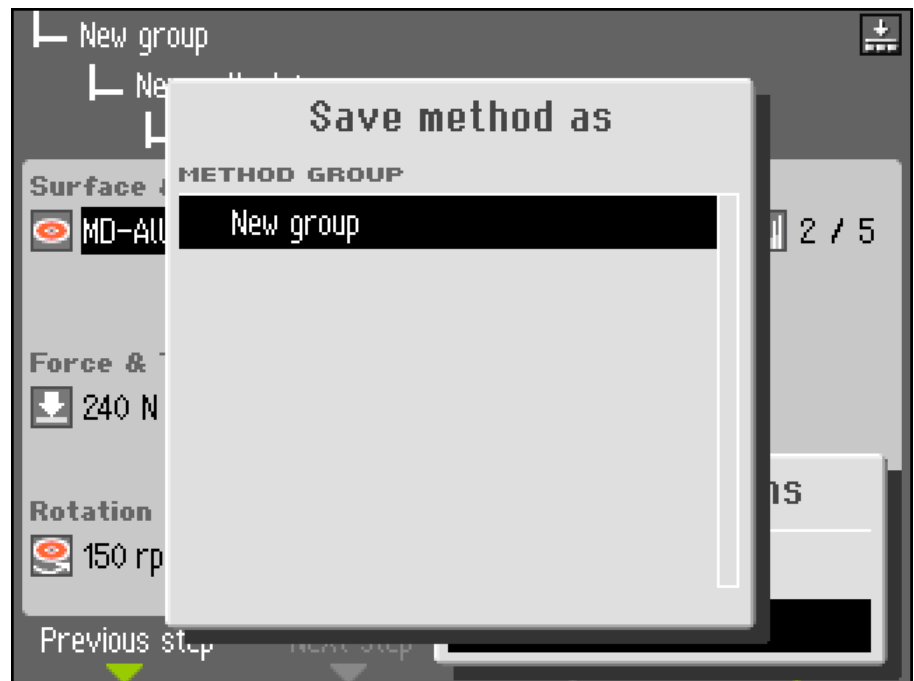
**OR** select *Save method as* and specify a New Method group and a New method name.

An entire preparation method can be created step by step. However, an easier way would be to modify an existing preparation method.

All existing preparation methods, including Metalog Guide methods can be used for modification.

*Modifying an existing preparation method*

Select the preparation method to be modified, go through the different preparation steps and make the necessary adjustments. Then press **F4** Save and select *Save method as* to save the method under a different name and, if wanted, in a different group.



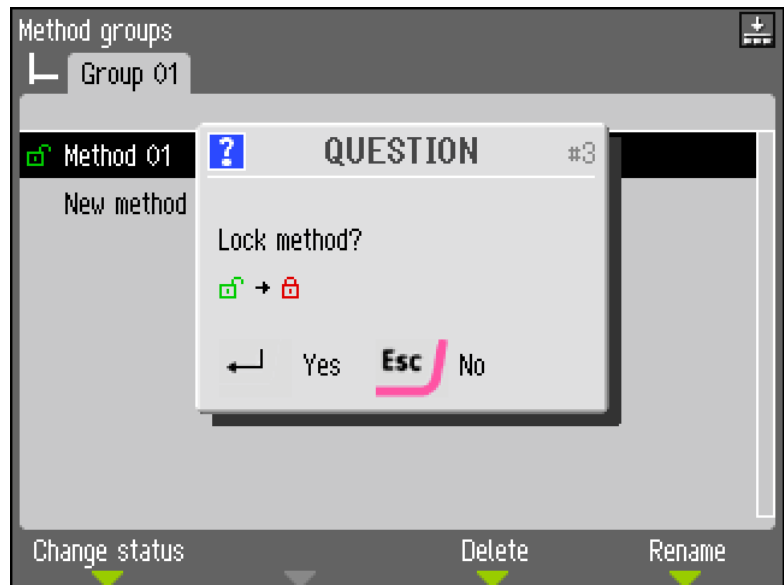


### Locking a Preparation Method

To avoid accidental changes or deletion of a preparation method, a method can be locked.

In the *Method view* screen, select the method to be locked, e.g Method 01.

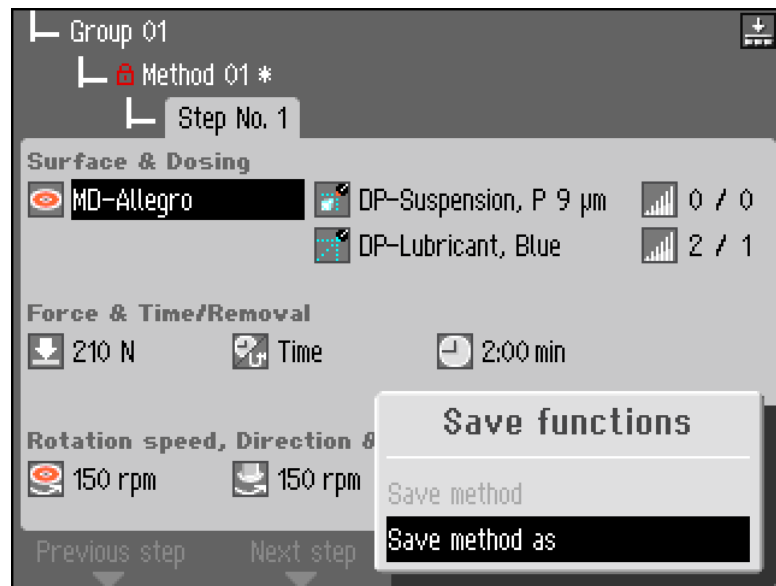
**F1** Press **F1** *Change status*



Push knob to lock the method.



The lock symbol in front of the method name has now changed status and shows the locked method. This method can still be modified, but when saving any changes it is only possible to select *Save method as*.




*Unlocking a Preparation Method*

To unlock a method repeat the procedure above.

The Tegramin software is now ready to begin the preparation process.


### **Starting the Preparation Process**

Once the desired method has been selected,

- Press Start  to start the preparation.

### **Stopping the Process**


The process stops automatically when the set preparation time has expired

- To stop the process before the set preparation time has expired, press .

### **Spin Function**

After a grinding process has finished, the built-in Spin function can be used to rotate the preparation disc at high speed to remove water from the surface of the disc.

This function can be used to remove water from a MD-grinding disc or a SiC-paper before removing it, or to dry an MD-Disc or an MD-Chem cloth.


- Press and hold the Disc key  to start the Spin function.
- Release the Disc key to stop the Spin function.

### 3. Operating Tegramin

#### Inserting Specimen Holders or Specimen Mover Plates

The Tegramin can be operated with either specimen mover plates for single specimens or specimen holders.

##### *Inserting a Specimen Holder*

- Press the Raise/Lower  button to ensure that the head is fully raised.
- Push the black button on the head.
- Insert the specimen holder and rotate it until the three pins are aligned and then push the holder upwards until it locks in position.
- Release the black button on the head and ensure that the specimen holder is securely fixed.


**WARNING!**

When working with specimen holders make sure that the screws clamping the specimens do not stick out of the specimen holder.  
Use different length of screws for specimens with different diameters.


**NOTE!**

Max. height of specimens in the specimen holder is 32 mm.  
Otherwise the specimen holder cannot be placed in the head.

##### *Inserting a Specimen Mover Plate*



- Use the Raise/Lower  button to ensure that head is fully raised.
- Push the black button on the head.  
Insert the specimen mover plate and rotate it until the three pins are aligned and then push the specimen mover plate upwards until it locks in position.
- Release the black button on the head and ensure that the specimen mover plate is securely fixed.

#### Lowering the Specimen Mover Head

- Press the Raise/Lower  button to lower the specimen mover head into position ready for preparation.  
The distance between the preparation disc and the specimen mover plate should be about 2 mm.  
For adjusting the distance please see the chapter: [Adjusting the Specimen Mover Plate Height](#).

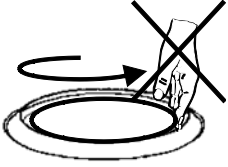
#### Adjusting the Horizontal Position of the Specimen Holder/ Mover Plate

To adjust the horizontal position of the specimen holder/ mover plate over the preparation disc:

- Press the LEFT  and Right  buttons to adjust the horizontal position.

The specimen holder/ mover plate should be positioned to allow the specimen to run 3 – 4 mm over the edge of the preparation disc.

## Manual Preparation

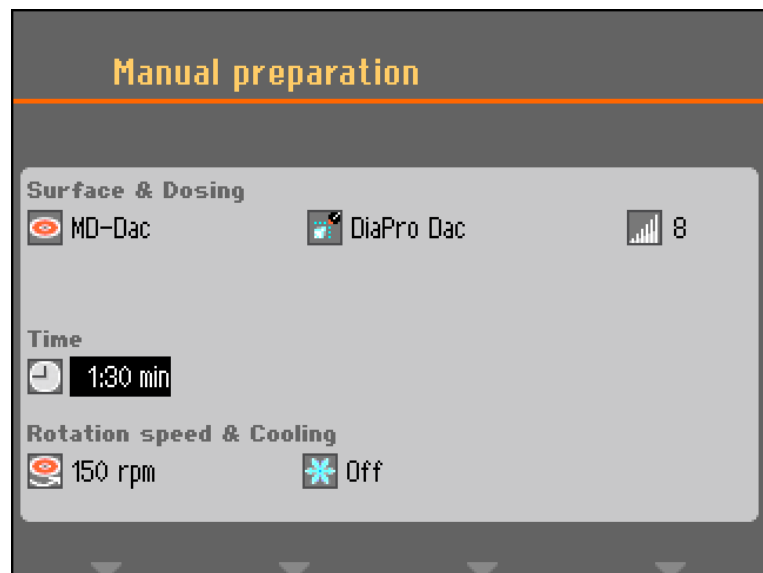



### **Warning!**

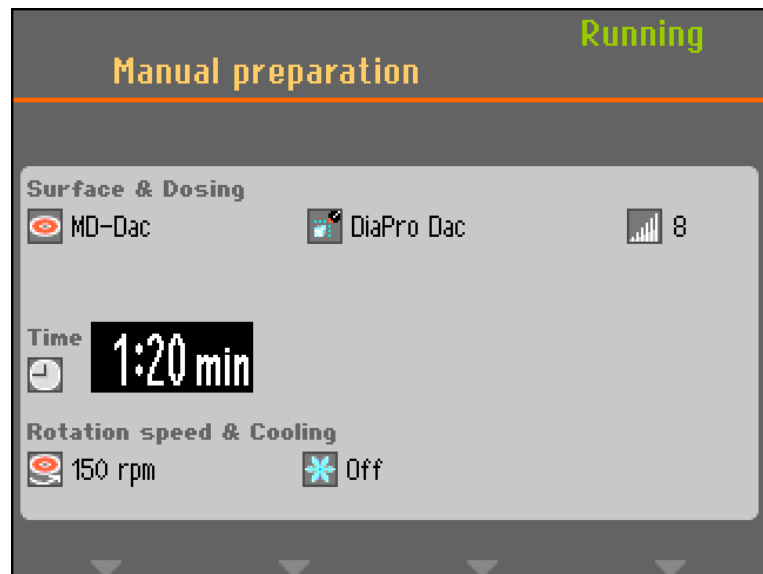
While grinding manually, be careful not to touch the grinding disc.  
Do not attempt to collect a specimen from the tray while the disc is running.  
Whilst the disc is rotating, ensure hands are kept well clear of its periphery and out of the splash bowl.

If a specimen cannot be prepared using a standard specimen mover plate or specimen holder, it can be prepared manually, using the automatic dosing function of Tegramin.


- From the *Main menu*, select *Manual preparation*.



- Set the type of suspension and dosing level and if required, set the values for the individual preparation parameters.
- Press Start .  
The disc will start turning at the pre-set speed and dosing will commence.



The disc and dosing will stop automatically when the pre-set time expires.

- To stop both the disc and the dosing before the time has expired, press Stop .

### Recommendations for Grinding Single Specimens

Do not use plane grinding with coarse abrasives when preparing single specimens. It is normally not necessary, and the use of coarse abrasives can result in un-plane specimens.

If, for whatever reason, it is necessary to grind using coarse abrasive, the planeness may be improved using the following recommendations:

- The height of the specimen should be between 8 – 35 mm and not exceed 0.7 x specimen diameter.  
*Example:* A specimen with a diameter of 30 mm should not be higher than  $30 \times 0.7 = 21$  mm.
- Use as small a grain size as possible.
- Use a mounting resin with a wear resistance similar to the specimens wear resistance.
- Use 150 rpm for both grinding disc and specimen mover. (When using lower speeds decrease the speed on both the disc and the specimen mover).
- Use co-rotation. (both the disc and the Specimen Mover Head rotate counter-clockwise).
- Use low force.
- Position specimen mover head of Tegramin so that the specimens do *not* pass over the centre of the preparation disc.

## **4. Accessories and Consumables**

Tegramin

Please refer to the [Tegramin brochure](#) for details of the range available.

Specimen Holders

Please refer to the [Struers Specimen Holders brochure](#) for details of the range available.

Attaching a Cover  
(optional/accessory)

Struers recommended using a cover when working with alcohol based consumables.  
A Cover kit is available as an accessory.

## 5. Trouble-shooting

Error message	Explanation	Action required
<b>Tegramin</b>		
#1 Emergency stop activated	This message is shown when the emergency stop button is activated	Message will disappear when the emergency stop button is released.
#13 Group name is already in use. Please select another name.	The name you want to use for a group of methods exists already.	Please use a different name for the group.
#14 Method name is already in use. Please select another name.	The name you want to use for a method exists already.	Please use a different name for the method.
#15 "xxx" is a reserved name. Please select another name.	The name you want to use is reserved by the Tegramin.	Please use a different name.
#19 Please raise the specimen holder head before you press Start.	The specimen holder head must be in the top position to continue.	Press Enter to acknowledge the message, then press $\blacklozenge$ to move the specimen holder head to the top position.
#23 The method is used for process. Some functions are not allowed.	The method is in use and some parameters cannot be changed and some functions are unavailable.	Press Enter to acknowledge the message.
#24 Suspension and lubricant are not compatible.	As user defined consumables are not divided into product groups, it is possible to combine a user defined suspension with an incompatible user defined lubricant.	Press Enter to acknowledge the message, and choose a lubricant which is compatible with the selected suspension or vice versa.
#25 Surface and suspension are not compatible.	As user defined consumables are not divided into product groups, it is possible to combine a user defined suspension with an incompatible surface.	Press Enter to acknowledge the message, and choose a different suspension (or surface).
#27 Specimen holder cannot be moved up.	A process in specimen holder mode is finished, but due to an error in the pressure regulating system, raising the holder has failed.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#28 Specimen holder cannot be moved down.	The specimen holder cannot be lowered due to an error in the pressure regulating system.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#35 Consumable name is already in use. Please select another name.	The name you want to use for a consumable exists already.	Press Enter to acknowledge the message. Please use a different name for the consumable.
#47 Tube(s) not selected for manual cleaning, please use the turn-push button to select tube(s).	No tubes have been selected for cleaning yet.	Press Enter to acknowledge the message. Please select the tube(s) you want to clean, then select cleaning again.



*Tegramin-25/ -30*  
*Instruction Manual*

<b>Error message</b>	<b>Explanation</b>	<b>Action required</b>
#57 Emergency stop activated, but 24V DC control power is constantly disconnected! Please call service technician.	The emergency switch has been activated, but the 24V control power is constantly disconnected.	Please contact a Struers service technician.
#59 No air or air pressure too low!	There is a failure in the compressed air supply.	Press Enter to acknowledge the message. Check and re-establish the compressed air supply.
#60 Pressure regulating error!	There is a failure in the pressure regulator.	Check the compressed air supply and restart the machine. If the error persists, contact a Struers service technician.
#61 Pressure system not calibrated!	The pressure system is not calibrated correctly.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#64 Disc motor not stopped!	After pressing stop or when the preparation time expired, the preparation disc did not stop.	Press Enter to acknowledge the message. Use the emergency stop to stop the disc. Restart the machine. If the error persists, contact a Struers service technician.
#65 Specimen holder motor not started or the motor is stopped due to an error!	The specimen holder motor could not be started or it was stopped before the preparation time expired.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#66 Specimen holder motor overload, please reduce the force.	The specimen holder motor is overloaded and is overheating.	Press Enter to acknowledge the message. Wait a little while to let the motor cool down, reduce the force and continue the preparation process.
#67 Specimen holder motor driven by disc motor, BLDC motor voltage critically high!	The specimen holder motor is driven by the preparation disc.	Press Enter to acknowledge the message.
#68 BLDC motor regulator output is zero, motor driven by disc motor.	The specimen holder motor is driven by the preparation disc.	Press Enter to acknowledge the message.
#69 Left or right end stop of specimen mover head not adjusted.	The end stops of the specimen mover head are not adjusted correctly.	Press Enter to acknowledge the message. Call a Struers service technician.
#70 The following dosing pump has a bad electrical connection: Pump motor ( )	There is no electrical connection to the pump mentioned.	Press Enter to acknowledge the message. Switch of the machine. Remove the pump module in question and slide back in position again. Restart the machine. If the error persists, contact a Struers service technician.
#71 Specimen mover motor power supply out of range or missing!	The power supply for the specimen mover motor is too high or too low (24 V DC +/- 10%).	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#72 24V DC supply out of range or missing!	24 V DC supply voltage out of 10% range. Power supply has to be adjusted or exchanged.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.

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<b>Error message</b>	<b>Explanation</b>	<b>Action required</b>
#73 12V DC supply out of range or missing!	12 V DC supply voltage out of 10% range. The PCB might be damaged.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#74 5V DC supply out of range or missing!	5 V DC supply voltage out of 10% range. The PCB might be damaged.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#80 Frequency inverter error! An under voltage state is detected.	The mains supply is too low, or the frequency inverter is defective.	Press Enter to acknowledge the message. Check the mains supply. Restart the machine. If the error persists, contact a Struers service technician.
#81 Frequency inverter error! An overvoltage state is detected.	The mains supply is too high, or the frequency inverter is defective.	Press Enter to acknowledge the message. Check the mains supply. Restart the machine. If the error persists, contact a Struers service technician.
#82 Frequency inverter error! The disc motor is overloaded.	The disc motor is overloaded, but not yet overheated.	Press Enter to acknowledge the message. Reduce the force and continue the preparation process.
#83 Frequency inverter error! The safety signal is not activated.	The safety signal in the frequency inverter (controlled by the Tegramin PCB) is due to an error not activated.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#84 Frequency inverter error! Alarm code: Fault code:	An error in the frequency inverter is detected. The codes shown are referring to the frequency inverter manual.	Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.
#87 The cover is not closed completely or the sensor is defective.	The sensor for the cover is not activated or defective.	Try to open and close the cover, check for possible obstacles. Restart the machine. If the error persists, contact a Struers service technician.
#89 A bad electrical connection for the following output is detected:  Valve Y#		Press Enter to acknowledge the message. Restart the machine. In certain circumstances (dependent on which module has failed) it may still be possible to operate the machine.  If the error persists, contact a Struers service technician.
#90 No communication to frequency inverter!		Press Enter to acknowledge the message. Restart the machine. If the error persists, contact a Struers service technician.

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<b>Error message</b>	<b>Explanation</b>	<b>Action required</b>
#92 No air or air pressure too low!	Air pressure too low to carry out "Adjustment of specimen mover plate height".	Check compressed air connection and press Enter to carry out to the adjustment. Or Press ESC to abort the adjustment.
#93 Force system error or air pressure too low!	Compressed air pressure is too low or there is a failure in the pressure regulation system.	Press Enter to acknowledge the message. Check compressed air connection (pressure should be between 6 and 10 Bar) If the error persists, contact a Struers service technician.
#94 A bad electrical connection for the following input is detected:  BP#		Press Enter to acknowledge the message. The machine can be used to perform manual preparations but will be unable to perform automatic preparations. Contact a Struers service technician.

	<b>Explanation</b>	<b>Action required</b>
<b>Physical Observations/Problems</b>		
Noise when the machine starts or the machine will not pull.	The belt is not tight enough.	Call a Struers service technician. The belt must be tightened.
Functions are not carried out.	Fuse at the rear of Tegramin blown.	Replace the fuse.
Machine not operating		
Water not draining away.	Drain hose squeezed.	Straighten the hose.
	Drain hose clogged.	Clean the hose.
	Drain hose does not slope downward.	Adjust the hose to slope evenly downwards.
Cooling water stops.	Wrong software setting.	Check software setting.
	Water tap on mains closed.	Open for water.
	Built-in water tap closed.	Open for water.
	Built-in water tap blocked.	Clean water tap.
	Filter at the water inlet blocked.	Clean filter.
Cooling water drips after stop.	Defect in the solenoid valve.	Call a Struers service technician. The solenoid valve must be replaced.
The disc vibrates.	Dirt on the underside of the disc or on the turntable.	Clean the contact face between the disc and turntable.
Continuous, irregular wear on a grinding/polishing surface.	Worn coupling on either specimen holder/mover plate or the specimen mover head of the Tegramin.	Please contact a Struers Service Technician to replace the coupling.

## 6. Maintenance

### Daily Service

- Clean all accessible surfaces with a moist cloth.
- Check and refill the dosing bottles.
- Check the bowl liner frequently and clean or dispose of when filled with debris.

**Tip:**

Do not use a dry cloth as the surfaces are not scratch resistant.  
Grease and oil can be removed with ethanol or isopropanol.

**IMPORTANT**

Never use acetone, benzol or similar solvents.

### Weekly Service

- Clean painted surfaces and the control panel with a soft damp cloth and common household detergents.
- Remove the MD-Disc and the bowl liner.
- Remove all dirt from the drain tube.
- Clean (or discard) the bowl liner and insert the clean (or new) bowl liner into the machine.
- Put the MD-Disc back in place.
- Clean the pressure feet and pistons applying the force on the specimens and specimen holder. (Select the *Maintenance menu* and *Cleaning of specimen mover head*).
- Press the release outlet valve to drain the water/oil filter (please see section on [Emptying the Water / Oil Filter](#)).

### Tegramin with Cover (optional/accessory)

- Clean the cover with a soft damp cloth and a common household anti-static window cleaning agent.

## Cleaning of Tubes

Tegramin is equipped with an automatic cleaning function for flushing the tubes between the bottles and the dosing nozzles.

To clean the tubes:

- Go to the *Maintenance* menu and select *Cleaning of tubes* then follow the on screen instructions.



The screenshot shows a screen titled "Cleaning of tubes" with a table of tube information. The table has four columns: "No.", "Susp./Lub. name", "Status", and "Select". The rows are numbered 1 to 7. The "Select" column contains "No" or "Yes" values. At the bottom of the screen, there are two buttons: "Start cleaning" and "Select 'Used'", both with green arrow icons pointing downwards.

No.	Susp./Lub. name	Status	Select
1	DiaPro All/Lar.	Clean	No
2	DiaPro Largo	Clean	No
3	DiaPro Dac	Used	Yes
4	DiaPro Dur	Clean	No
5	DP-Suspension, P 3 µm	Used	Yes
6	DP-Lubricant, Blue	Used	No
7	DP-S	Clean	No

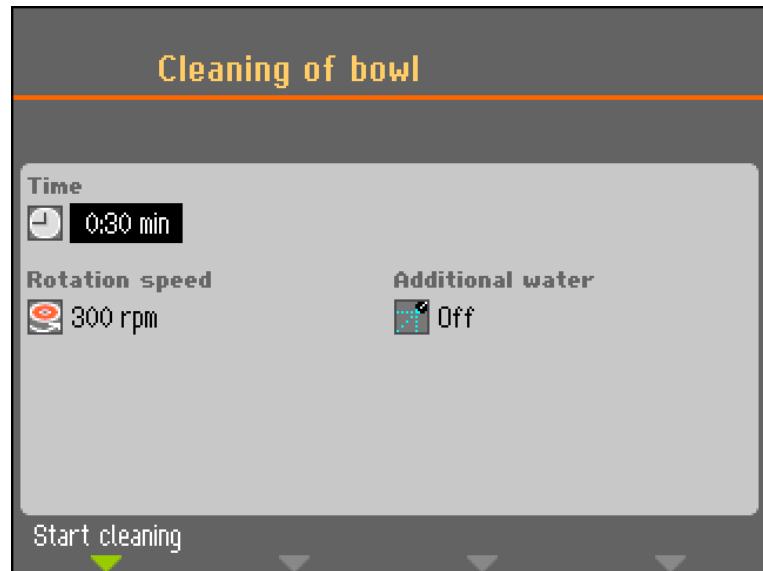
Start cleaning      Select "Used"

- Press F4 to select all the tubes that have been used. To select or unselect a single tube move the cursor to the respective tube and press Enter.
- When 1 or more tubes have been selected, press F1 to start the cleaning process.
- Follow the instructions on the screen to complete the operation.

## Cleaning the Bowl

Tegramin is equipped with an automatic bowl cleaning function. To clean the bowl:

- Go to the *Maintenance* menu and select *Cleaning of bowl*.
- Set the cleaning time, the speed of the disc and select additional water if requested.



- Press F1 to start the cleaning process.

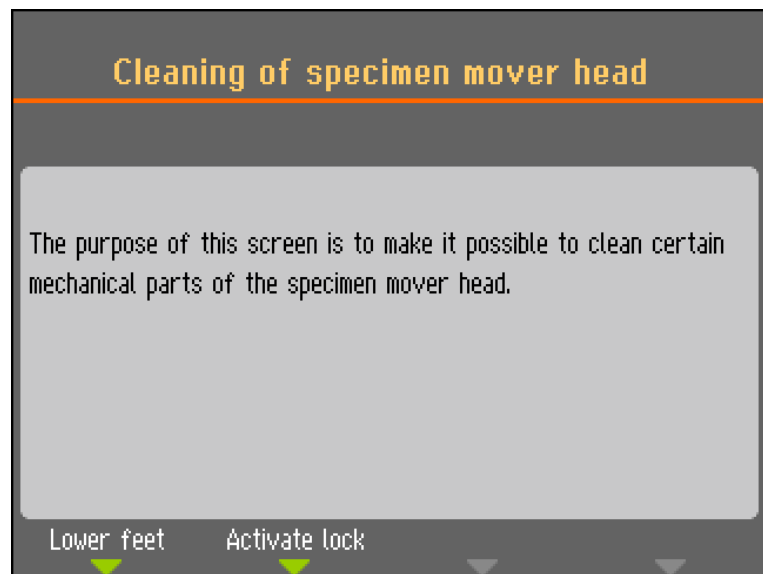
**NOTE!**

If a bowl insert is used, remove the insert prior using the *Cleaning of bowl* function, to avoid flushing the debris into the drain.

## Cleaning of Specimen Mover Head

Tegramin is equipped with a function that allows you to clean the feet applying the force onto the specimens and also the lock that secures the specimen mover plate for single specimens.

- To activate these functions:  
Go to the *Maintenance* menu and select *Cleaning of specimen mover head*.
- Press F1 or F2 to activate either of the functions.



- Press **F1** to lower the feet - the pistons can now be cleaned or lubricated.
- Press **F2** to activate the lock.  
This is mainly to check its function and to remove dirt or particles that may obstruct its movement and the locking function.

***IMPORTANT!***

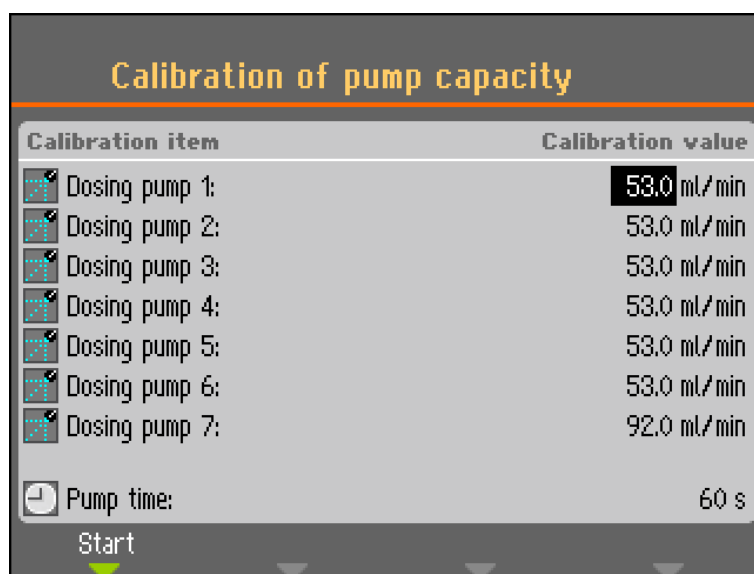
Never try to force any of the movements. If the components do not move as they should always contact the Struers technical service.









## Calibration of Pump Capacity

The amount of liquid delivered onto the preparation surface can change over time. To be able to keep a constant dosing level, every pump can be calibrated individually.

To calibrate the pumps:

- Go to the *Maintenance* menu, select *Calibration and adjustments* and then select: *Calibration of pump capacity*.



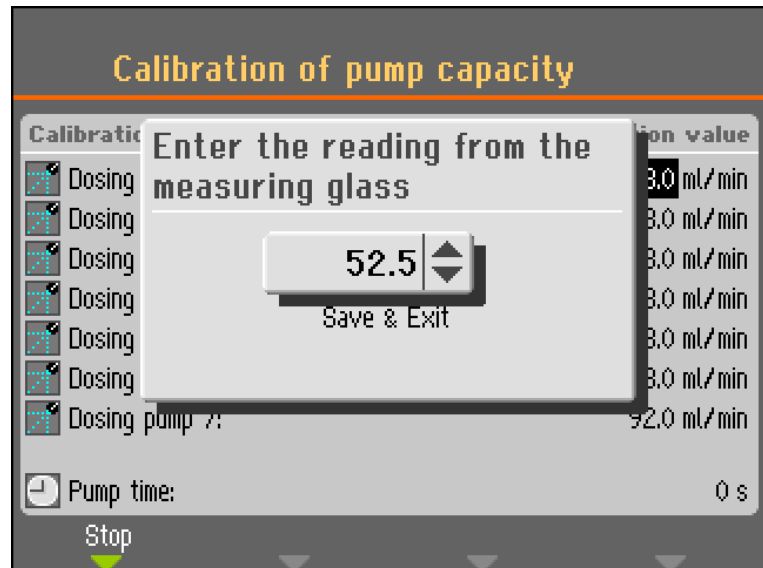
Calibration item	Calibration value
 Dosing pump 1:	53.0 ml/min
 Dosing pump 2:	53.0 ml/min
 Dosing pump 3:	53.0 ml/min
 Dosing pump 4:	53.0 ml/min
 Dosing pump 5:	53.0 ml/min
 Dosing pump 6:	53.0 ml/min
 Dosing pump 7:	92.0 ml/min
 Pump time:	60 s

Start

- Select the pump to be calibrated by moving the cursor to the respective position.
- Exchange the bottle with suspension or lubricant with a container with water and press F1 to start the pump.
- When the water coming out of the nozzle is clean (clear) stop the pump by pressing F1 again.
- Take an empty measuring cylinder and place it underneath the dosing nozzle. (For highest accuracy weigh the measuring cylinder).
- Press F1 again to start the calibration process. The pump will run for precisely 60 seconds.
- After the pump stops, measure the volume of water in the container (or weigh the measuring cylinder again).



- Enter the amount of water measured and confirm the new value by selecting *Save & Exit*.



Based on the new calibration value, Tegramin will now recalculate the dosing levels to ensure the best possible accuracy.

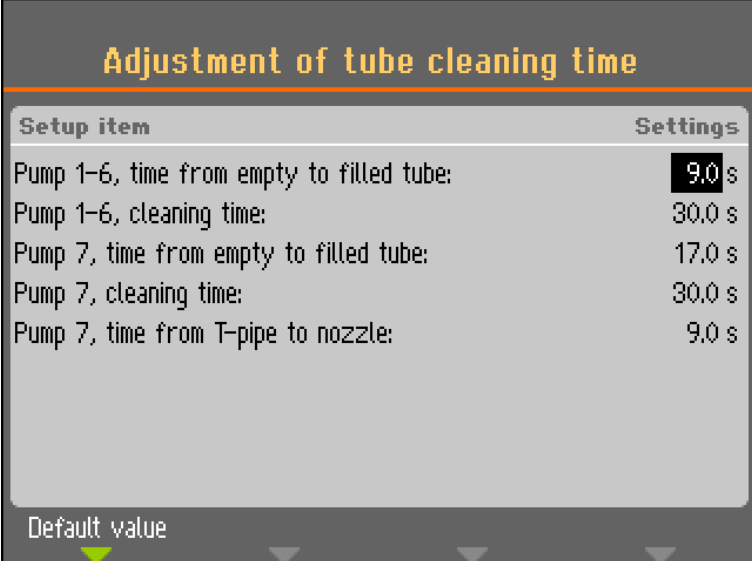
- Repeat the process for the other bottles.

## Adjustment of Tube Cleaning Time

Tegramin is also equipped with a function to specify the length of time needed to clean certain parts of the tube. These values are also used when refilling the tube with suspension or lubricant after a tube cleaning. Therefore the cleaning times can be adjusted e.g. if the tubes have been shortened after installing the dosing units.

To adjust the tube cleaning time:

- Go to the *Maintenance* menu, select *Calibration and adjustments* and then select: *Adjustment of tube cleaning time*.



The screenshot shows a menu titled "Adjustment of tube cleaning time" with a table of settings. The table has two columns: "Setup item" and "Settings". The settings are as follows:

Setup item	Settings
Pump 1-6, time from empty to filled tube:	9.0 s
Pump 1-6, cleaning time:	30.0 s
Pump 7, time from empty to filled tube:	17.0 s
Pump 7, cleaning time:	30.0 s
Pump 7, time from T-pipe to nozzle:	9.0 s

At the bottom of the screen, there is a "Default value" label with a green arrow pointing to the first setting (9.0 s).

Time from empty to filled tube  
Pumps 1-6

Increase the time if: the diamond suspensions or lubricants do not reach the dosing nozzles after a cleaning process before a preparation step starts.

Decrease the time if: too much diamond suspension or lubricant is dosed before the pre-dosing is started

Pump 7

Increase the time if: the OP suspension does not reach the dosing nozzles after a cleaning process before a preparation step starts.

Decrease the time if: too much OP suspension is dosed before the pre-dosing is started

Cleaning time

Cleaning time can be set for all tubes. The cleaning time specifies how long the pump will run during a cleaning cycle. This value can be changed depending on personal preferences.

Time from T-pipe, to nozzle  
(Pump 7 only)

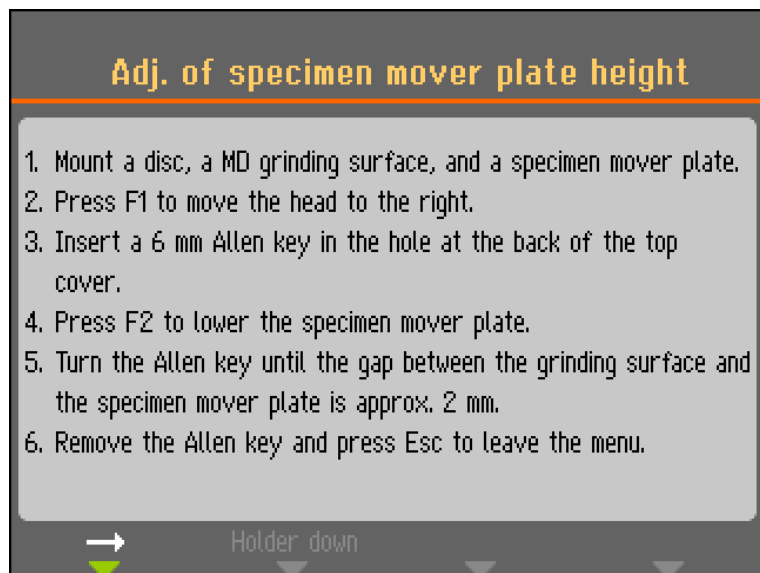
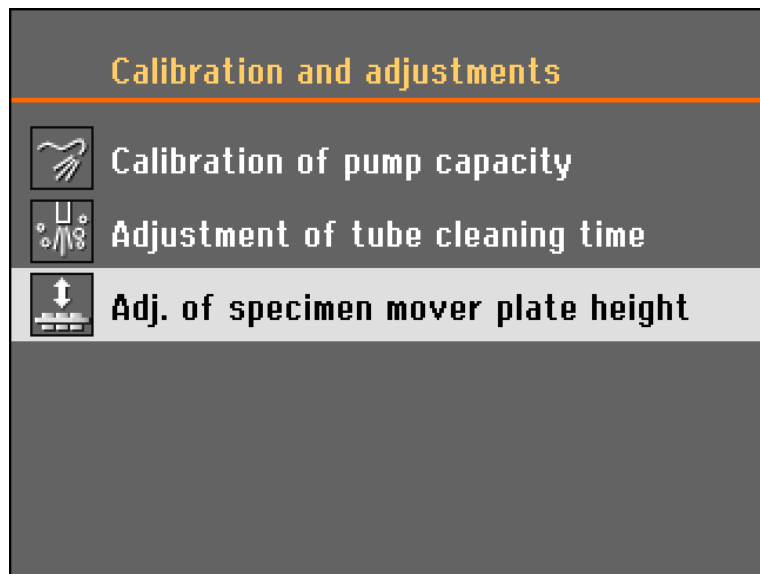
The time from the T-pipe, where the water for flushing is added, to the nozzle can also be set.

## Adjusting the Specimen Mover Plate Height

Tegramin is equipped with a mechanism to adjust the distance between the specimen mover plate and preparation disc.

To adjust the distance:

- Go to the *Maintenance* menu, select *Calibration and adjustments* and then select: *Adj. of specimen mover plate height* and follow the on screen instructions.



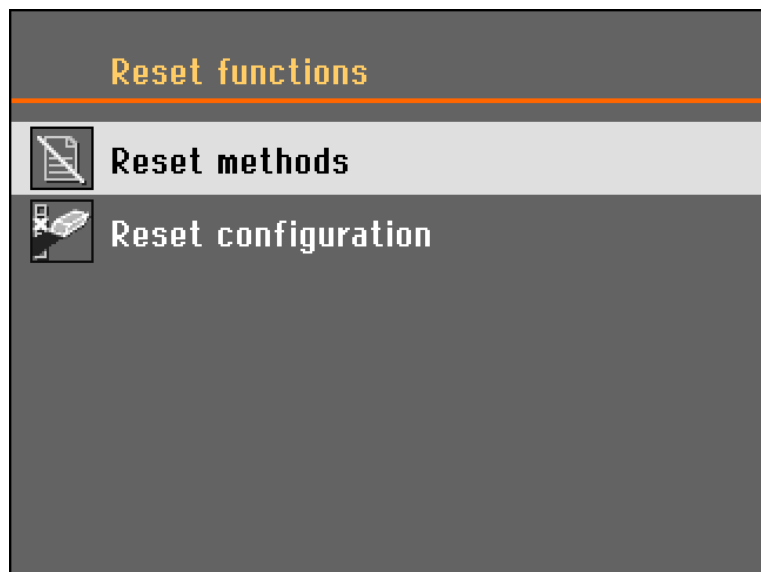
- Turn Allen key Clockwise to increase the gap.
- Turn Allen key Counter - Clockwise to decrease the gap.

## Reset Functions

It can become necessary to reset certain functions to the factory settings using the *Reset functions* menu. For example when exchanging dosing modules which have a different pump configuration (e.g. mounting a dosing module with 1 DP pump in place of a 2 DP dosing module).

To reset methods or configuration:

- Go to the *Maintenance* menu and select: *Reset functions*.



### *Reset Methods*

- When selecting *Reset methods* there are 2 selections possible: Reset methods in one group, and Reset methods in all groups.

**IMPORTANT!**

When the preparation methods are reset in one group or in all groups they are deleted and cannot be re-established.

### *Reset Configuration*

- Select *Reset configuration* to set all configuration parameters back to their default settings.
- Switch Tegramin off, then on again and reconfigure the settings.

**Tip!**

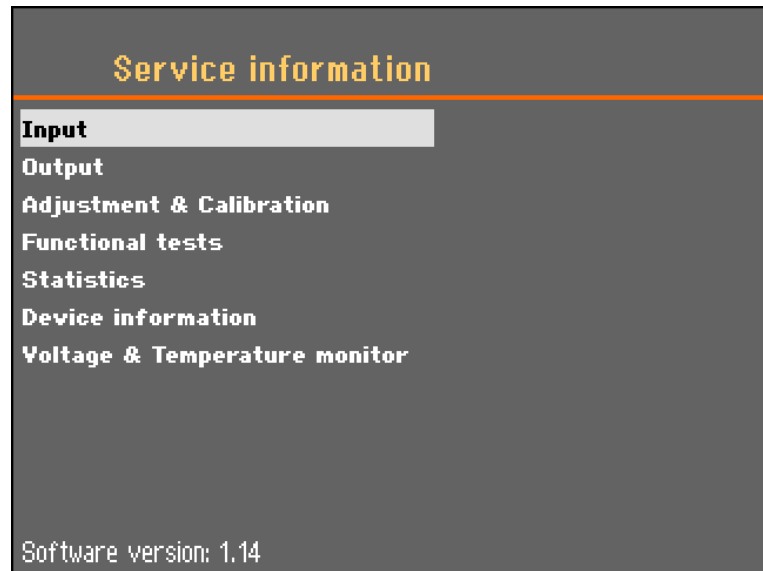
It is advisable to make a note of your own customised settings under *Options* or *Bottle configuration* before carrying out a *Reset configuration*.

## Service Information

Tegramin offers extensive information about the conditions of all different components.

To reach this function:

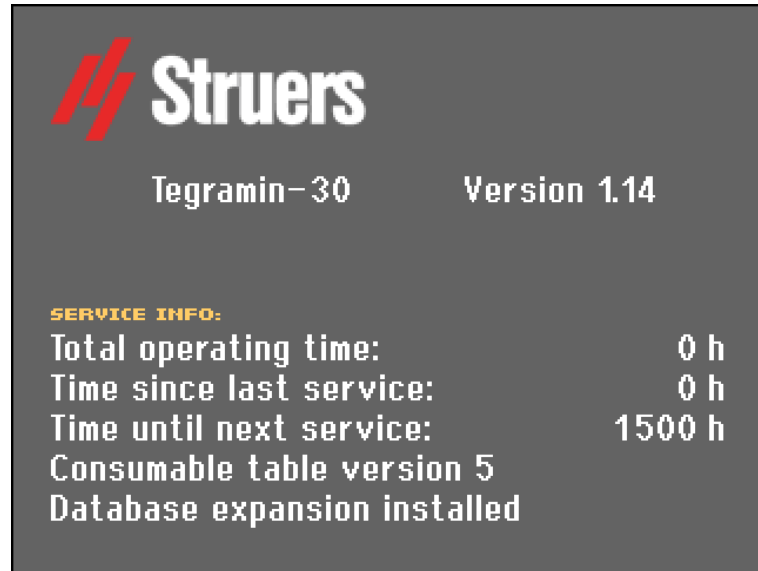
- Go to the *Maintenance* menu and select: *Service information*.



Various topics can be selected for information on the condition of the different components. Service information can also be used in cooperation with a Struers service technician for remote diagnostics of the equipment. Service information is read-only information, machine settings cannot be changed or modified.

## Service Check

Struers recommends that a regular service check be carried out after every 1500 hours of use. Information on total operation time and servicing of the machine is displayed on the screen at start-up:



A pop-up message will appear after 1,000 hours operation time to remind the user that a service check should be scheduled.

After the 1,500 hours operation time has been exceeded the pop-up message will change to alert the user that the recommended service interval has been exceeded.

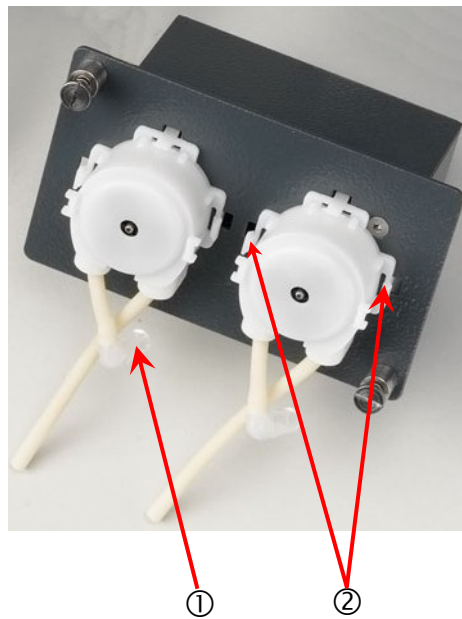
- Contact a Struers Service Technician to service the machine.

## Changing Tubes

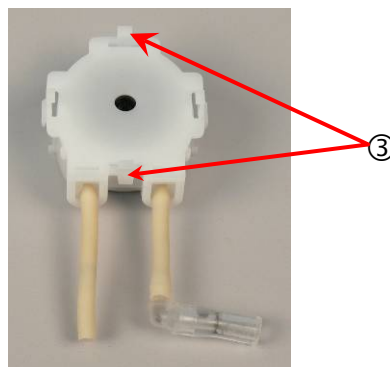
When working with alcohol based lubricants, the Novoprene tubes mounted in the pumps supplied with Tegramin will harden over time. Therefore a piece of silicone tubing is supplied with the Tegramin dosing modules as Silicone has a better resistance against alcohol.

To exchange the Novoprene tube with a Silicone tube:

- Separate the doser tubes at the white coupling (the coupling should stay on the tube connected to Tegramin).
- Disconnect the other end of the tube from the Tegramin ①.



- Press the two tabs at the base of the pump ② and remove the pump from the axle.
- Press the two tabs on the pump ③ and remove the bottom cover.

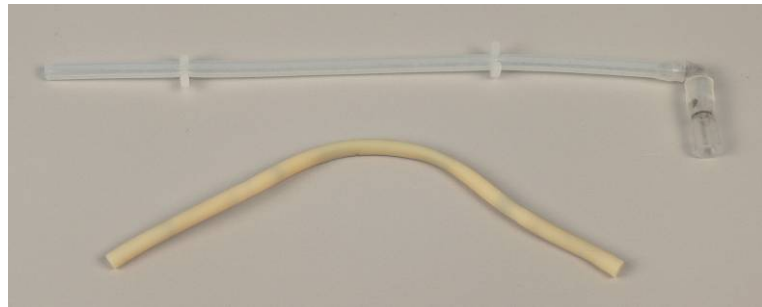




- Remove the 3 rollers.



- Remove the Novoprene tube and transfer the white clips and the connector to the new silicone tube (Note:- the two clips must be the same distance apart as on the original tube).



- Fit the new tube into the housing and press firmly into place. Press the 3 rollers in the pump housing.



- Re-mount the bottom cover.
- Press the pump back onto the axle, then re-connect the tubes
- Check that the tubes are connected correctly so that liquid is pumped to the dosing nozzles.

## 7. Technical Data

Subject		Specifications	
		Tegramin-25	Tegramin-30
Disc	Diameter	250 mm / 10"	300 mm / 12"
	Speed	40-600 rpm, variable	
	Rotational direction	Counter-clockwise	
	Disc motor	750 W / 1.0 HP	750 W / 1.0 HP
	Torque at disc Cont. at <300 rpm Cont. at 600 rpm Max.	23.8 Nm / 17.6 ft-lbf 11.9 Nm / 8.8 ft-lbf > 40 Nm / 29.6 ft-lbf	23.8 Nm / 17.6 ft-lbf 11.9 Nm / 8.8 ft-lbf > 40 Nm / 29.6 ft-lbf
Head	Speed	50-150 rpm, variable	
	Rotational direction	Clockwise, counter-clockwise	
	Head motor	120W	160W
	Torque	7.5 Nm / 5.6 ft-lbf	10 Nm / 7.4 ft-lbf
Software and electronics	Controls	Touch pad and push/turn knob	
	Memory	FLASH-ROM / RAM / NV-RAM	
	LC display	TFT-colour 320x240 dots with LED back light	
Safety		Please refer to the Declaration of Conformity	
Stop Mechanisms, Designed to comply with:	Emergency stop	EN60204-1, Stop Category 0 EN954-1, Category 2	
	Cover	EN60204-1, Stop Category 2 EN954-1, Category B	
Noise level	At idle running, at a distance 1.0 m / 39.4" from the machine	47 dBA	
	During preparation	Polishing 54 dBA, Grinding 56 dBA	
Surrounding temperature		5-40°C / 41-104°F	
Humidity	Non condensing	0-95% RH	

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Subject		Specifications	
		Tegramin-25	Tegramin-30
Supply	Voltage / frequency	200-240 V / 50-60 Hz	
	Power inlet	1-phase (N+L1+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II".	
	Power, nominal load	1060W	1060W
	Power, idle	13W	13W
	Current, nom.	5.3 A	5.3 A
	Current, max.	10 A	10 A
	Pressure for tap water	1-10 bar / 14.5-145 psi	
	Water inlet	13 mm or 19mm / 1/2" or 3/4"	
	Water outlet	Ø 40 mm / 1 1/2"	
	Air inlet	Ø6 mm/ 1/4"	
	Air pressure	6-10 bar / 87-145 psi	
	Air quality	Recommended quality: ISO 8573-1, class 5.6.4.	
"Exhaust" (with Cover only)	Dimension	Ø50 mm / 2" Recommended capacity for exhaust system: 50m <sup>3</sup> /h / 1750ft <sup>3</sup> /h at 0mm water gauge.	
Dimensions and weight (without Cover)	Width	67.5 cm / 26.6"	67.5 cm / 26.6"
	Depth	75 cm / 29.5"	75 cm / 29.5"
	Height	56 cm / 22.0"	56 cm / 22.0"
	Weight	83 kg /183 lbs	83 kg / 183 lbs
Dimensions and weight (with Cover)	Width	67.5 cm / 26.6"	67.5 cm / 26.6"
	Depth	75 cm / 29.5"	75 cm / 29.5"
	Height (cover closed/ cover open)	58.2 cm / 22.9" 93 cm / 36.6"	58.2 cm / 22.9" 93 cm / 36.6"
	Weight	91 kg / 201 lbs	91 kg / 201 lbs