

# 815 Robotic Soliprep for LC



2.815.4110

Manual

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**Manual**

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# 1 Introduction

## 1.1 Instrument description

The 815 Robotic Soliprep systems are automation systems suitable for a variety of uses. They have been designed exclusively for utilization in factories and laboratories and cover a wide range of applications. Soliprep systems can be used for automation purposes wherever a complex sample preparation of solid substances is required, e.g. for pharmaceutical or food analysis.

The Robotic Sample Processors, which have proven their worth for many years, form the basis for a versatile system that has been expanded to include opportunities for the dispersion, filtration and bottling of samples of all sorts. This versatile concept can be expanded as required.

Thanks to the integration of high-performance communication interfaces (USB, RS-232), they can be incorporated seamlessly into a variety of instrument systems, and not only those manufactured by Metrohm. Operation by the high performance *tiamo*<sup>™</sup> or MagIC Net<sup>™</sup> software ensures not only user-friendly operation and programming of automation sequences, but also allows 100% conformity for the entire automation system with FDA (Food and Drug Administration) regulations. This applies in particular with regard to regulation *21 CFR Part 11, Electronic records and signatures*.

### **815 Robotic Soliprep for Liquid Chromatography**

- Dispersion, filtration, dilution and sample transfer

The universal automation system for sample preparation in instrumental chromatography. A workstation equipped with a dispersion device is used to shred the sample. The dispersion aggregate is cleaned in a special rinsing station. The second workstation is equipped for sample transfer with a universal robotic arm with a Luer adapter. It is used for picking up syringe needles (for aspirating the dispersed sample and bottling the filtrate in sealed vials) and membrane filters (for filtering and injecting the sample in a capillary).

Needles and filters are charged in replaceable inserts. The needles and filters are automatically stripped off after use and disposed of in a waste container.

Two versatile dosing drives (800 Dosino) are used as an auxiliary device for diluting the sample and for transferring the sample solution.



## 1.2 Intended use




The 815 Robotic Soliprep for LC is designed for the automatic analysis of larger-sized sample series in analytical laboratories. The functioning of the automation system comprises crushing, homogenizing and dissolving of solid samples as well as filtering and transferring the resulting sample solutions. Its main area of application is the sample preparation in instrumental chromatography. It is **not** suitable for usage in biochemical, biological or medical environments in its basic equipment version.

This instrument is suitable for processing chemicals and flammable samples. Therefore, the use of the 815 Robotic Soliprep for LC requires the user to have basic knowledge and experience in handling toxic and caustic substances. Knowledge regarding the application of fire prevention measures prescribed for laboratories is also mandatory.

## 1.3 About the documentation

### 1.3.1 Symbols and conventions

The following symbols and formatting may appear in this documentation:

(5-12)	<b>Cross-reference to figure legend</b> The first number refers to the figure number, the second to the instrument part in the figure.
<b>1</b>	<b>Instruction step</b> Carry out these steps in the sequence shown.
<b>Method</b>	<b>Dialog text, parameter</b> in the software
<b>File ► New</b>	Menu or menu item
<b>[Next]</b>	<b>Button</b> or <b>key</b>
	<b>WARNING</b> This symbol draws attention to a possible life-threatening hazard or risk of injury.
	<b>WARNING</b> This symbol draws attention to a possible hazard due to electrical current.
	<b>WARNING</b> This symbol draws attention to a possible hazard due to heat or hot instrument parts.

**WARNING**

This symbol draws attention to a possible biological hazard.

**CAUTION**

This symbol draws attention to possible damage to instruments or instrument parts.

**NOTE**

This symbol highlights additional information and tips.

## 1.4 Safety instructions

### 1.4.1 General notes on safety

**WARNING**

Operate this instrument only according to the information contained in this documentation.

This instrument left the factory in a flawless state in terms of technical safety. To maintain this state and ensure non-hazardous operation of the instrument, the following instructions must be observed carefully.

### 1.4.2 Electrical safety

The electrical safety when working with the instrument is ensured as part of the international standard IEC 61010.

**WARNING**

Only personnel qualified by Metrohm are authorized to carry out service work on electronic components.

**WARNING**

Never open the housing of the instrument. The instrument could be damaged by this. There is also a risk of serious injury if live components are touched.

There are no parts inside the housing which can be serviced or replaced by the user.



### Supply voltage



#### WARNING

An incorrect supply voltage can damage the instrument.

Only operate this instrument with a supply voltage specified for it (see rear panel of the instrument).

### Protection against electrostatic charges



#### WARNING

Electronic components are sensitive to electrostatic charges and can be destroyed by discharges.

Do not fail to pull the power cord out of the power socket before you set up or disconnect electrical plug connections at the rear of the instrument.

### 1.4.3 Personnel safety



#### WARNING

Personnel are not permitted to reach into the working area of a Sample Processor while operations are running!

A **considerable risk of injury** exists for users who undertake manual interventions to the automatic running of the instrument.

The various drives in a Sample Processor (including Swing Heads) have considerable power in order to ensure that they are able to be operated perfectly, even with greater loads. They are equipped with an electronic overload protection that is activated in the presence of excessive mechanical resistance.

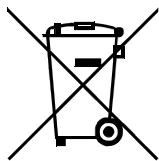


#### WARNING

The Sample Processor does not provide sufficient protection during the processing of potentially infectious samples or reagents.

Implement appropriate protective measures.

## 1.5 Recycling and disposal



This product is covered by European Directive 2012/19/EU, WEEE – Waste Electrical and Electronic Equipment.

The correct disposal of your old instrument will help to prevent negative effects on the environment and public health.

More details about the disposal of your old instrument can be obtained from your local authorities, from waste disposal companies or from your local dealer.







- 2 Screw tight the handles of the sample rack.

## 2.2 Connecting the instrument to the power grid



### WARNING

#### Electric shock from electrical potential

Risk of injury by touching live components or through moisture on live parts.

- Never open the housing of the instrument while the power cord is still connected.
- Protect live parts (e.g. power supply unit, power cord, connection sockets) against moisture.
- Unplug the power plug immediately if you suspect that moisture has gotten inside the instrument.
- Only personnel who have been issued Metrohm qualifications may perform service and repair work on electrical and electronic parts.

### Connecting the power cord

#### Accessories

Power cord with the following specifications:

- Length: max. 2 m
- Number of cores: 3, with protective conductor
- Instrument plug: IEC 60320 type C13
- Conductor cross-section 3x min. 0.75 mm<sup>2</sup> / 18 AWG
- Power plug:
  - according to customer requirement (6.2122.XX0)
  - min. 10 A



### NOTICE

Do not use a not permitted power cord!

#### 1 Plugging in the power cord

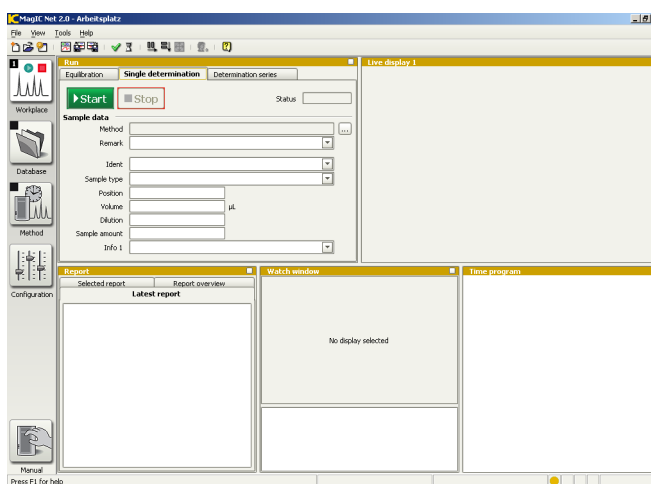
- Plug the power cord into the instrument's power socket.
- Connect the power cord to the power grid.

## 2.3 Installing MagIC Net™

### Installing MagIC Net



- 1 Insert the MagIC Net CD into the CD drive of the PC and carry out the installation following the instructions. After this, start MagIC Net.



## 2.4 Configuring the Swing Heads

### Connecting the controller cable on the computer



- 1 Connect the controller cable to a USB connector of the computer.



**For Windows 2000:** The instrument is recognized and the driver is installed automatically.

**For Windows XP:** The instrument is recognized and the installation assistant for the driver is started automatically. Select the option "Install software automatically" and click on **[Continue]**. Exit the assistant with **[Finish]**.

**For Windows Vista:** the instrument is recognized and the installation wizard for the driver is started automatically. Select the option "Find and install driver software". Agree to all of the requests that follow. The installation assistant will be exited automatically.

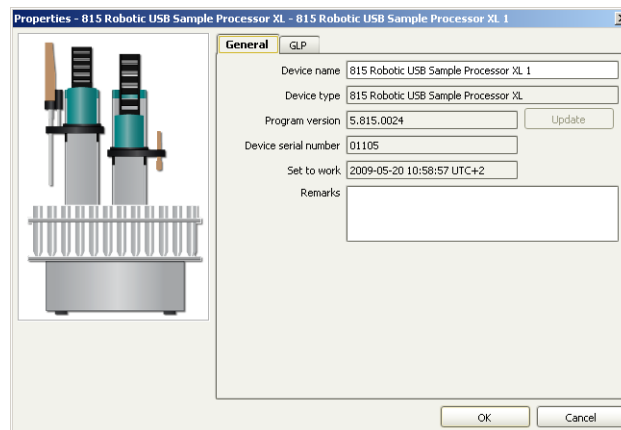
### Instrument registration

The USB Sample Processor is automatically recognized by MagIC Net.



- 1 Confirm with **[Yes]**.

The properties window for configuring the instrument is displayed.



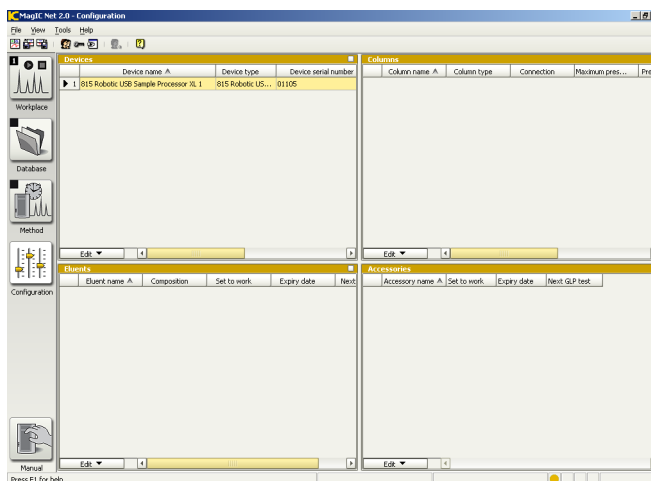
- 2 Confirm with **[OK]**.

## Configuring the Swing Heads

Configure the robotic arms for both towers.

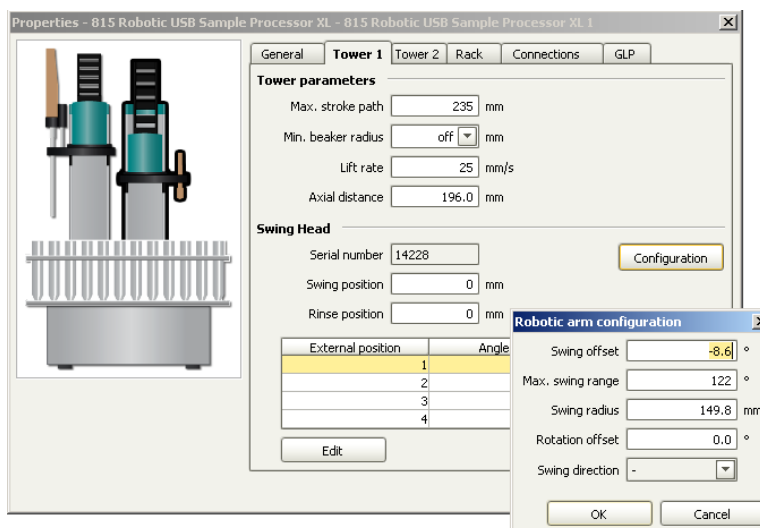


- 1 Click the **Configuration** icon.



- 2 Double-click on the instrument name **815 Robotic USB ...** in the **Devices** window.

- 3 First click on the **Tower 1** tab and then on **Configuration**.

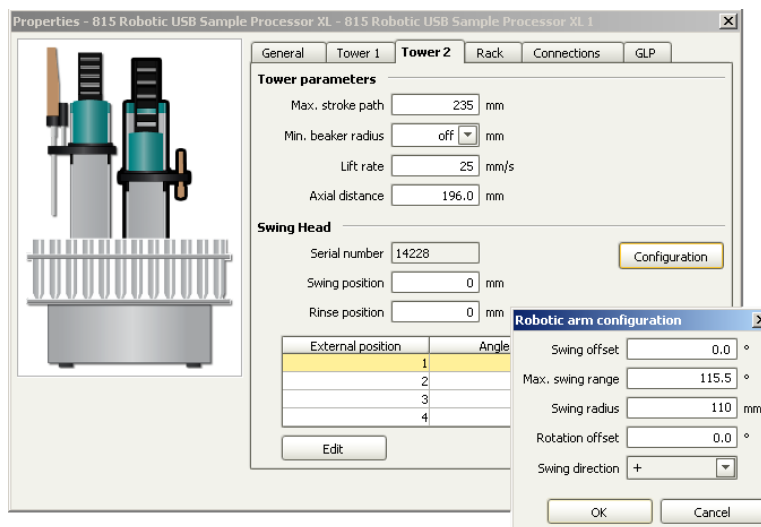


Enter the following settings:

- Swing offset **-8.6°**
- Maximum swing range **122°**
- Swing radius **149.8 mm**
- Rotation offset **0.0°**

- Swing direction –

4 First click on the **Tower 2** tab and then on **Configuration**.



Enter the following settings:

- Swing offset **0.0°**
- Maximum swing range **115.5°**
- Swing radius **110 mm**
- Rotation offset **0.0°**
- Swing direction **+**

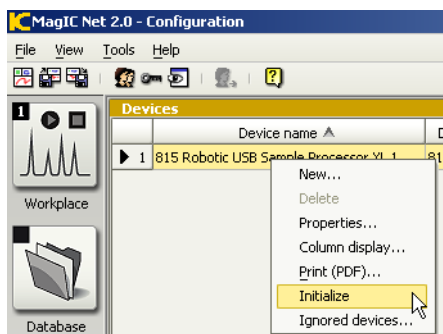
5 Finish the settings with **[OK]**.

For the settings to take effect, the instrument must be reinitialized.

6 Click on **[OK]**.

7 Attach a sample rack on the turntable of the instrument.

8 Right-click on the instrument name **815 Robotic USB ...** in the **Devices** window and click on Initialize.



The Sample Processor is initialized. The settings of the Swing Heads and robotic arms are now activated.

## 2.5 Mounting the Swing Heads

### Preparing the towers

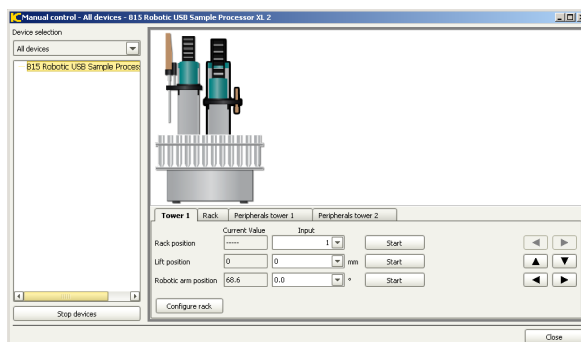
Both lifts must be moved to a suitable position for the mounting of the Swing Head and robotic arms to be comfortable.



#### 1 Opening the manual control

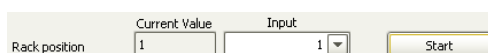
In the symbol bar of MagIC Net, click on the hand symbol.

#### 2 Under **Device selection**, first select **All devices** and then the **815 Robotic USB ...**. Click the **Tower 1** tab.



#### 3 Moving the lift to position

Under **Rack position**, click on **[Start]**.



The sample rack moves to a defined position. Only now, the lift can be moved.

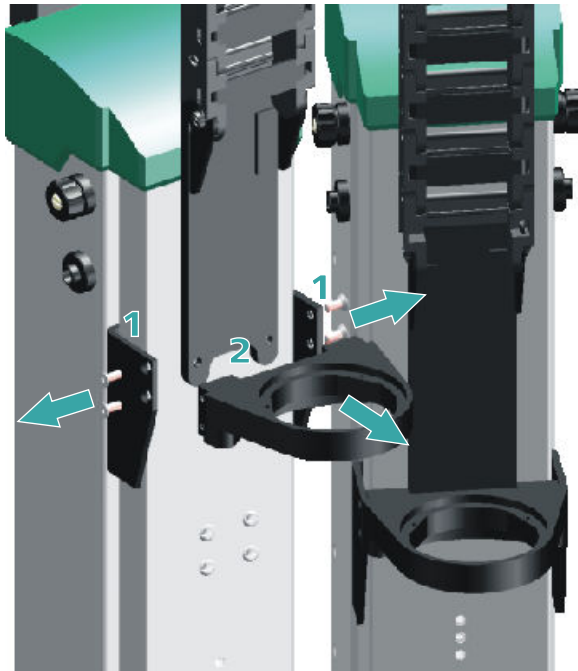


- 4** Under **Lift position**, click on the arrow button "down" until the lift 1 has moved approx. 180 mm downwards.

Lift position	180	0	mm	Start	▲	▼
Robotic arm position	44.9	0.0	°	Start	◀	▶

Both lifts are now in a suitable position so that all screws for mounting the Swing Heads can be reached easily.

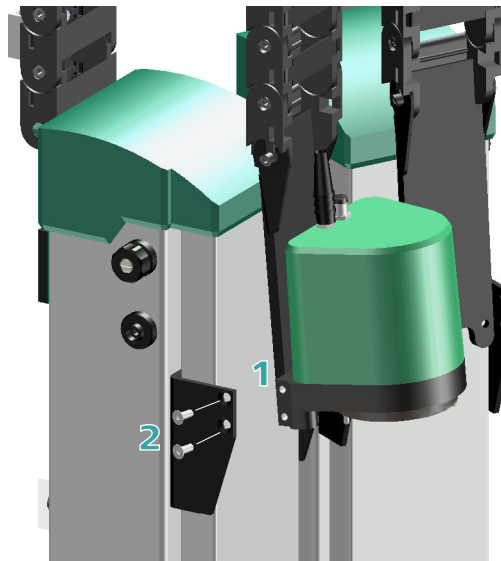
### Dismounting the titration head holder



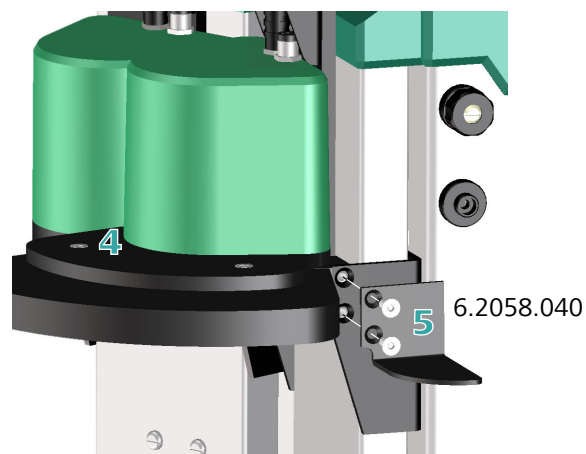
- 1** Unscrew the screws on the outside and inside of the holder on tower 2 (left).
- 2** Unscrew and remove the holder from the holder plate of the guide chain.
- 3** Remove the holder also on tower 1.

Use the supplied hex key. Set the screws aside for later use.

## Mounting the Swing Heads



- 1** Screw the Swing Head without reinforcement tightly to the holder plate of the guide chain on tower 2 with two V.024.4012 countersunk screws.
- 2** Clamp the Swing Head between the guide jaws and screw it tight.
- 3** Screw the second Swing Head (with reinforcement) tightly to the holder plate of the guide chain on tower 1 with two V.024.4012 countersunk screws.
- 4** Clamp the Swing Head between the guide jaws and screw the two screws on the left side tight.

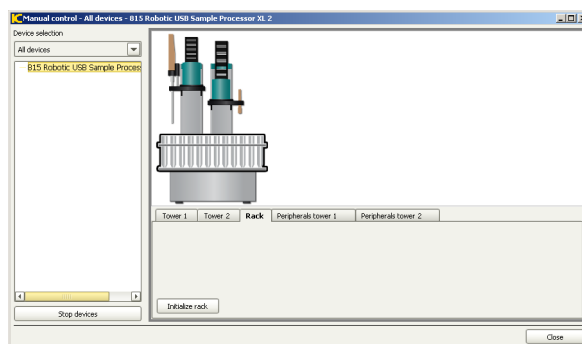




- 5 Mount the 6.2058.040 robotic arm reinforcement on the right side fixing the Swing Head at the same time. Use the two screws provided with the robotic arm reinforcement. These are longer than the screws used previously.

### Initializing the rack and Swing Heads

Both Swing Heads must be moved to the starting position for the mounting of the robotic arms.



- 1 On the tab **Rack**, click on **[Initialize rack]**.

Both lifts are moved upwards. The Swing Heads are now in the starting position.

## 2.6 Mounting the deflector, Luer connector and collection container

When injection needles and disposable filters are used, these need to be stripped off the robotic arm again afterwards. A deflector has been mounted for this purpose. Proceed as follows:

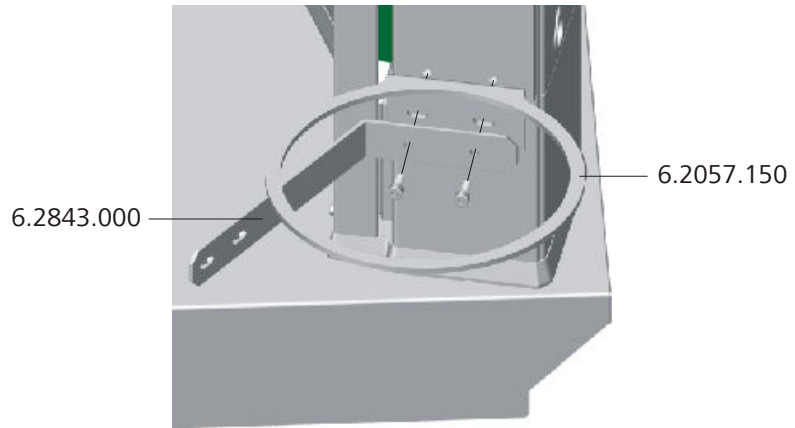
### Mounting the deflector

- 1 Loosen the uppermost two screws on the right-hand side of tower 1.
- 2 Screw the 6.2058.050 fastening plate tightly with the aid of the screws supplied.

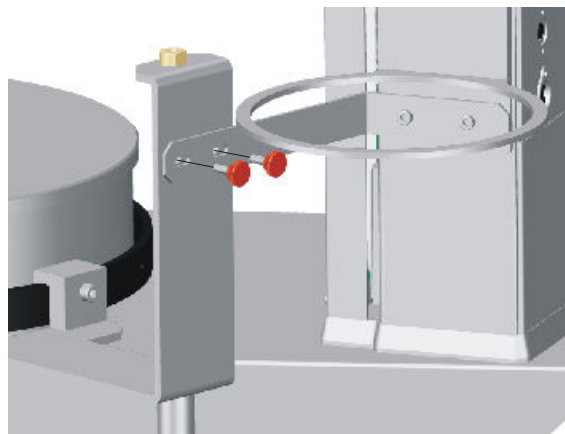




- 3** Fasten the 6.2057.150 holder for the collection container and the stabilizing square of the 6.2843.000 Luer connector together to the fastening plate of the tower, see figure.



- 4** Fix the holder of the Luer connector with both knurled screws supplied to the stabilizing square.



- 5** Guide the 6.1625.010 collection container with opened cover into the holder.





## 2.7 Mounting the transfer robotic arm

### Preparing the Swing Head

After the initialization, the drive disk of the Swing Head is positioned as though the robotic arm were located in the outermost position. In order to be able to mount the robotic arm in a favorable position, rotate the drive disk with **Manual control** in MagIC Net™ as follows:



#### 1 Opening the manual control

In the symbol bar of MagIC Net™, click on the hand symbol.

#### 2 Under **Device selection**, first select **All devices** and then the **815 Robotic USB ...**. Click the **Tower 1** tab.

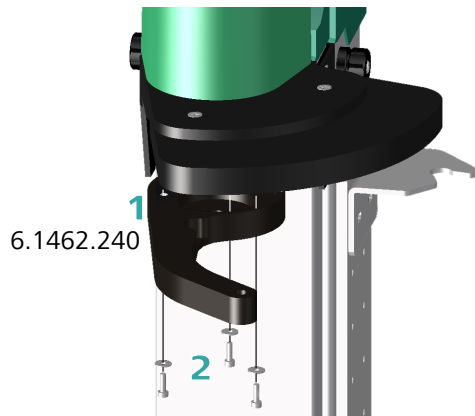
#### 3 Under **Rack position**, click on **[Start]**.

The rack moves to a valid rack position.

#### 4 Click on the arrow button "left" under **Robotic arm position** until the drive disk is no longer moving.



### Mounting the robotic arm



Mount the 6.1462.240 robotic arm to tower 1 as follows:

#### 1 Align the robotic arm parallel to the left-hand edge of the Swing Head reinforcement and graze it across the guide pins of the drive

disk of the Swing Head from below. The correct position of the arm can be found in the previous illustration.



#### NOTICE

Take care not to twist the drive disk and thereby put strain on the drive.

- 2 Tighten the robotic arm to the Swing Head with the screws and washers supplied.

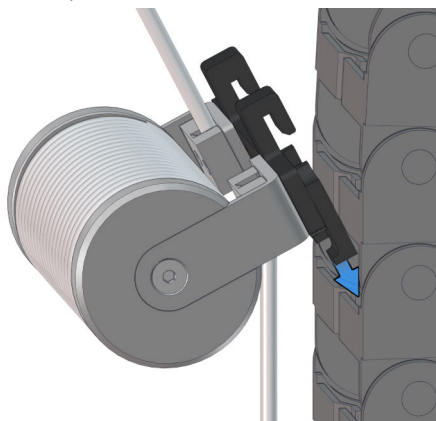
### Installing the transfer tubing

The transfer tubing needs to be long enough to aspirate or eject samples. The 6.1562.130 transfer tubing holds 10-mL volumes and is installed on a holder on the guide chain of tower 1.

Proceed as follows to install the transfer tubing on the guide chain:

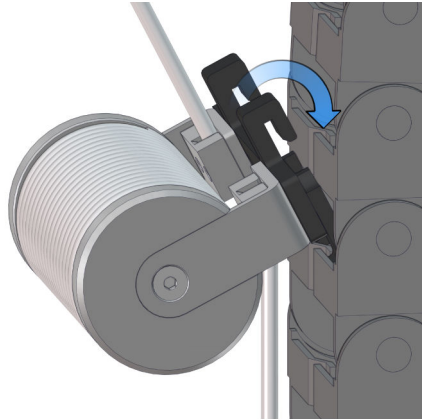
#### 1 Attaching the holder with transfer tubing

- Insert the bottom part of the holder with transfer tubing between two clips of the chain links.

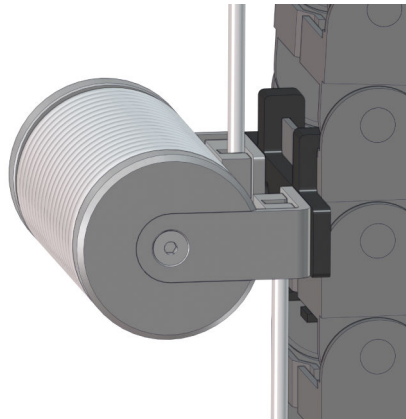




- Insert the upper hook of the holder in the upper clip.

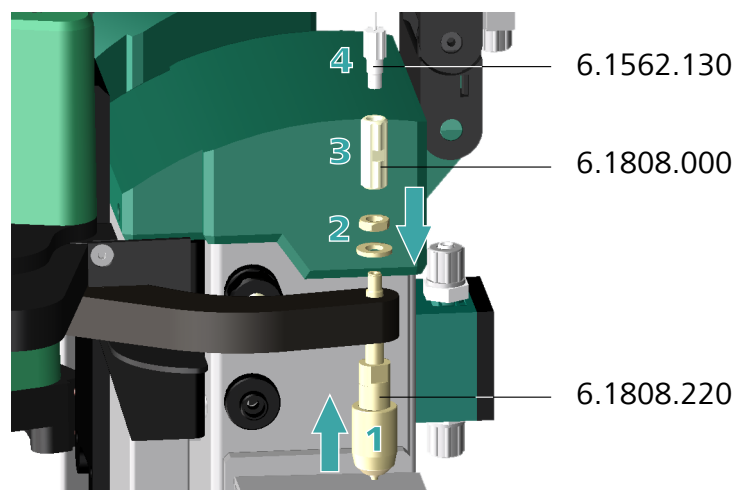


- Let the bottom part of the holder snap in the bottom clip.



### Mounting the Luer adapter

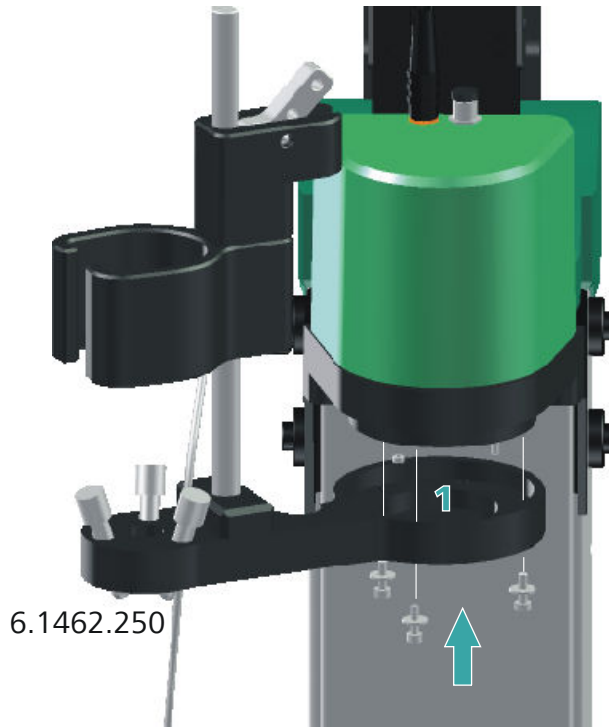
The transfer robotic arm is used to pick up filters or injection needles. For this, the 6.1808.220 adapter is employed. Mount it as follows:



- 1** Unscrew the screw and washer of the adapter and insert the adapter in the robotic arm head from below.
- 2** Screw tight the adapter with the screw and the washer. Carefully tighten the screw with a wrench, if needed.
- 3** Screw the tubing adapter (with 2x M6 inner thread, supplied with the adapter) tightly onto the adapter.
- 4** Fasten the previously mounted 6.1562.130 transfer tube to the 6.1808.000 tubing adapter.



## 2.8 Mounting the Polytron robotic arm



Mount the 6.1462.070 robotic arm to tower 2 as follows:

- 1 Hold the robotic arm in such a way that the holder faces to the left and slip it over the guide pins of the drive disc from below. While doing so, let the robotic arm point outwards as far as possible, i.e. towards the tower - see above.



### NOTICE

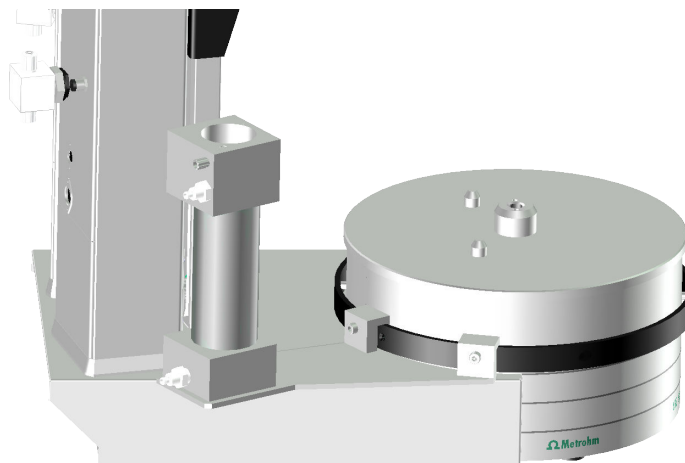
Take care to ensure that you do not twist the drive disc, thus causing pressure against the drive.

- 2 Screw the robotic arm to the Swing Head tightly with the screws and washers provided.

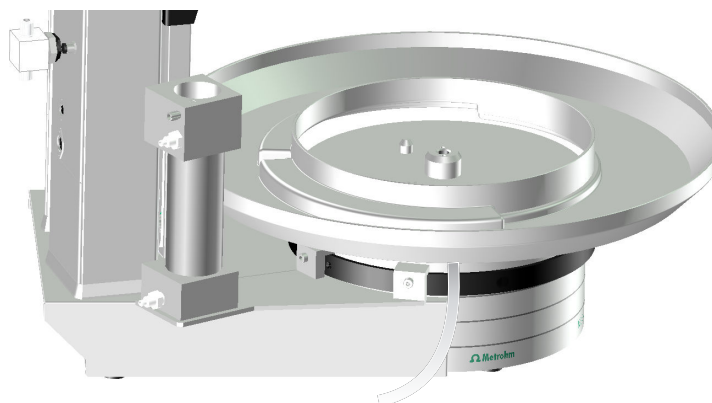
## 2.9 Washing station and drip pan

To mount the washing station and the drip pan, remove the sample rack. Now proceed as follows:

- 1 Mount the washing station to the left next to tower 2 on the assembly rail and screw it tightly.



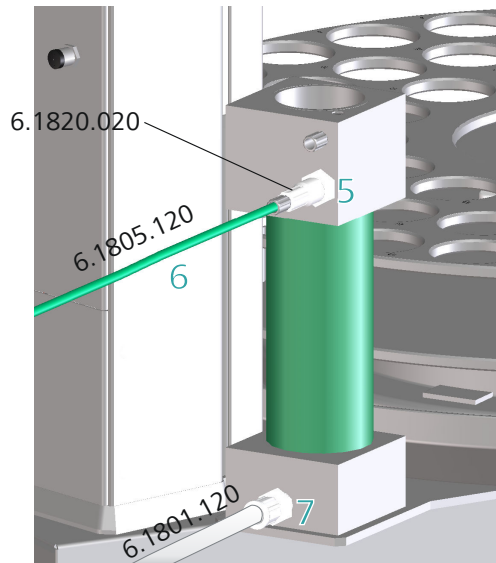
- 2 Fasten the enclosed tubing to the drainage nipple on the drip pan and guide the free end of the tubing into a drain or a waste container.
- 3 Place the drip pan over the stirrer rail. The correct alignment of the drip pan can be seen from the following illustration. Correct the position of the washing station slightly as needed.



- 4 Reattach the sample rack.



- 5** Fasten the 6.1820.020 screw connector with the M6 connector to the upper, larger tubing connector of the washing station.



- 6** Connect the green 6.1805.120 FEP tubing (1 m length) to the screw connector. This is the feed line of the washing station. Connect the other end of the tubing to the distributor of tower 2.

- 7** Fasten a 6.1812.000 PTFE tubing to the lower tubing connector of the washing station. This is the outlet of the washing station.
- Shorten the tubing to a suitable length, so that it can be connected to a peristaltic pump (772 Pump Unit).
  - Remove the union nut of lower tubing connector and guide it over the end of a **6.1812.000 PTFE tubing**. You may have to extend the tubing end in order to be able to better mount the tubing, see the following note.
  - Pull the end of the tubing over the connection nipple of the distributor and fasten in place with the union nut.



#### NOTICE

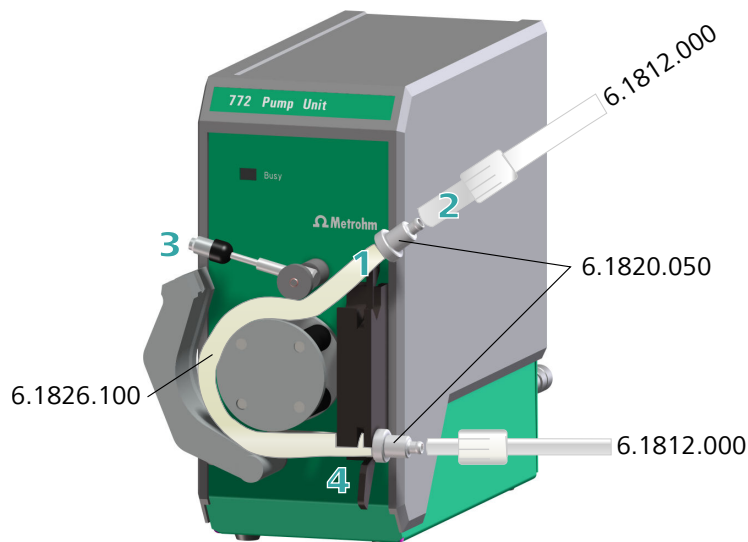
The opening of the tubing may need to be widened with a sharp object (e.g. with a Phillips screwdriver).

A piece of sandpaper may be used to get a better grip on the tubing.

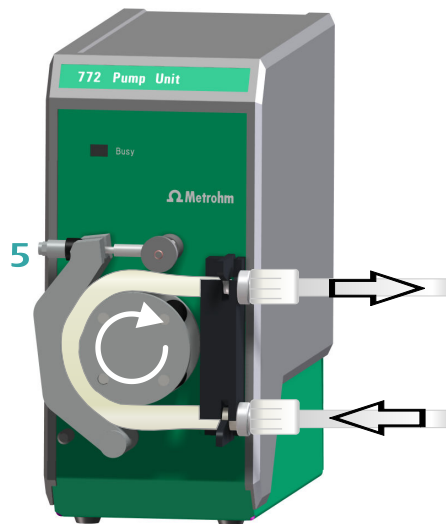
Do not extend the tubing end before having slid the union nut onto the tubing.

## 2.10 Connecting and setting up the peristaltic pump

A peristaltic pump 772 Pump Unit is used for aspirating the rinsing station at tower 2.

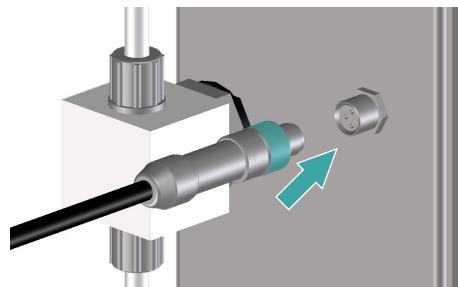


- 1** Cut a 6.1826.100 pump tubing to approx. 17 cm and mount a 6.1820.050 tubing olive on both ends.
- 2** Fasten a piece of 6.1812.000 PTFE tubing leading to a waste container to one of the tubing olives. Attach the 6.1812.000 PTFE tubing that is connected to the rinsing station as a drain connection to the other olive connector.
- 3** Loosen the locking lever by rotating the clamping screw and open the pressure clamp.
- 4** Place the pump tubing around the rotor and fix it in place using the tubing clamps. The rotor rotates clockwise. Therefore, the inlet tubing must be inserted below and the waste tubing above.



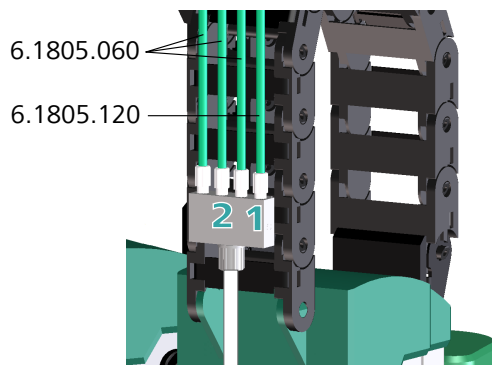
**5** Apply pressure to the pressure clamp and clamp tightly with the locking lever. Tighten the clamping screw so that the pump tubing cannot slip. The flow rate of the pump can be regulated during operation using the clamping screw.

**6** Connect the connection cable of the pump to tower 2. The instrument must be switched off.



## 2.11 Installing the rinsing tubing

### Rinsing tubing on tower 2



Install the tubings for rinsing of the rinsing station as follows:

- 1 Connect the green inlet tubing (6.1805.120) of the rinsing station to one of the four connectors on the tower 2 distributor.
- 2 Connect three pieces of 6.1805.060 tubing (60 cm) to the tower 2 distributor.
- 3 Connect a 6.1812.000 PTFE tubing to the tower 2 valve. Connect the other end of the tubing to a canister with rinsing liquid (e.g. water).

## 2.12 Placing tubing and cables in the guide chain

Tubing and cables can be placed in the guide chain.

The guide chain contains a firmly installed clip on each chain link.



### CAUTION

When mounting tubing and cables, make sure that there is no traction on the drives while moving the lift or swinging the robotic arm. Traction on the drive can overload and damage the drive.

If a robotic arm is used, we recommend placing the tubing and cables only above the third chain link in the guide chain to prevent traction on the drives.

Do **not** or only partially place rigid tubings, as for example aspiration tubings made of PTFE, into the guide chain.

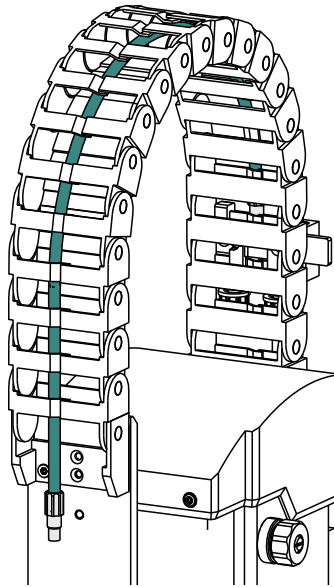
**NOTICE**

Make sure that tubing and cables do not kink.

Inserting and removing the tubing and cables requires no tools.

**1 Placing tubing and cables**

- Press one side of the clip downwards and place tubing or cables in the guide chain.

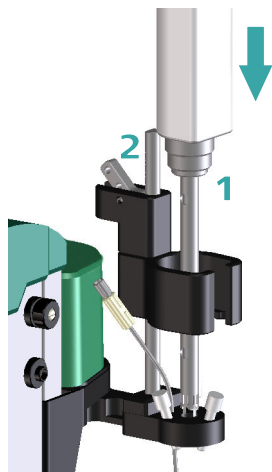
**2 Removing tubing and cables**

- Press one side of the clip downwards and remove tubing or cables from the guide chain.

## 2.13 Assembling and mounting the Polytron® drive

Please consult the Polytron user manual for details how to mount the aggregate to the **Polytron PT 1300 D**.

### Mounting the Polytron

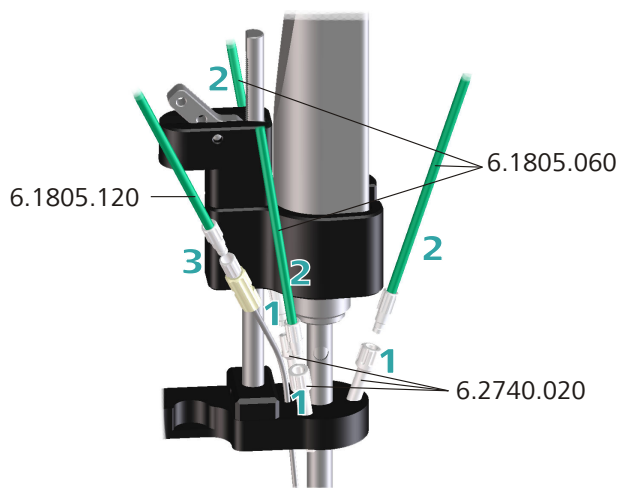


Mount the Polytron as follows:

- 1** Insert the Polytron with the aggregate already mounted into the robotic arm holder on tower 2 from above.
- 2** Readjust the position of the holder if necessary. Press down the fixing lever of the holder to accomplish this.

## 2.14 Mounting the rinsing tubings for the Polytron®

For rinsing the Polytron aggregate rinsing nozzles must be mounted on the robotic arm. Proceed as follows:



- 1** Replace the three stoppers on the Polytron robotic arm with 6.2740.020 rinsing nozzles.
- 2** Connect the three rinsing tubings that are connected to the tower 2 distributor to the rinsing nozzles.
- 3** The preinstalled tubing of the robotic arm is used to add solvent to the sample. Connect a 6.1805.120 to it and connect the other end of the tubing to to the port 1 of the Dosino with a 50 mL dosing unit.

## 2.15 Connecting the Polytron®

The **Polytron® PT 1300 D** is comprised of a control module and a dispersion drive with dispersion aggregate for mixing and shredding solid samples. The control device is directed by a PC software, e.g. MagIC Net™, via a serial RS-232 connector.

Please refer to the operating instructions of the Polytron for details regarding connecting. The Polytron is connected as follows:

- 1** ■ Connect the connecting cable of the dispersion device to the front of the control module.
- 2** ■ Check the set supply voltage on the connection socket on the rear side of the control module.
  - Switch off the instrument.
  - Plug in the power supply cable and connect to a socket.

- 3
  - Connect the 6.2134.110 RS-232 connection cable to the 9-pin connection socket on the rear side of the control module.
  - Plug in the other end of the cable to the COM1 or COM2 port on the PC. The port on the PC is usually marked with **IOIOI**.  
If the PC has no serial interface, then a USB port on the PC can be used with the aid of an RS-232/USB converter (e.g. the 2.145.0320 Edgeport).



#### NOTICE

The Polytron must be registered manually in MagIC Net™ as an RS-232 device.

## 2.16 Mounting the safety shield

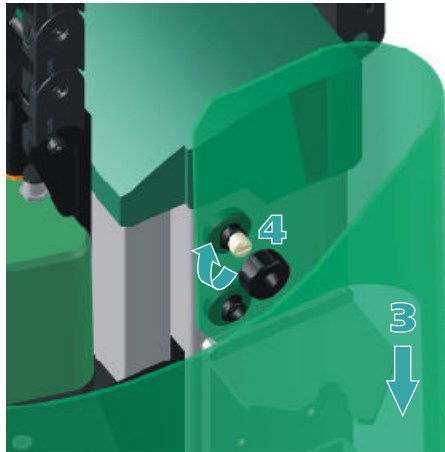
### Safety shield 6.2751.150

The 815 Robotic Soliprep for LC may not be operated without a safety shield. Install it as follows:

- 1 Mounting the spacer for the safety shield with the screws supplied to tower 1 according to the following figure.



- 2 Unscrew the black nuts on both sides of tower 1.
- 3 Pull the green 6.2751.150 safety shield over tower 1, starting from the top.



**4** Screw the safety shield tightly with the two nuts as shown in the following illustration.

**5** Adjust the safety shield on the spacer, see the following figure.



## 2.17 Installing the Dosino

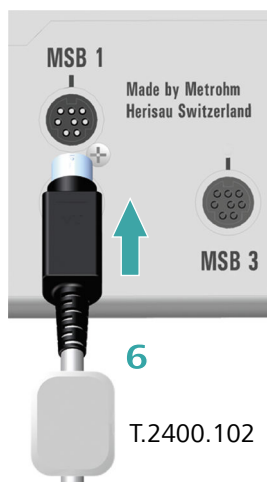
For the transferring and diluting of the sample, two Dosinos with a 10 mL and a 50 mL dosing unit is used. They are being installed as follows:

### Preparing the Dosino 1 for sample transfer



- 1 Screw an adsorber tube filled with cotton to the **Vent** connector on the 10 mL dosing unit.
- 2 Equip the dosing unit with a filling tubing (Port 2 on the underside of the dosing unit) and screw it onto a 6.1808.070 clear glass bottle (2 L, with GL 45 thread). The bottle should be filled with the solvent (water or an organic solvent) which is also used for sample dispersion.
- 3 Connect the transfer tubing to tower 1 with the end that is still free to Port 1 on the dosing unit.
- 4 Place the Dosino (dosing drive) on the dosing unit.
- 5 Equip the connection cable of the Dosino with an anti-interference adapter made of ferrite (T2400.102) (see drawing).

Connect the connection cable to the MSB connector 1 (MSB 1) on the rear of the Sample Processor.



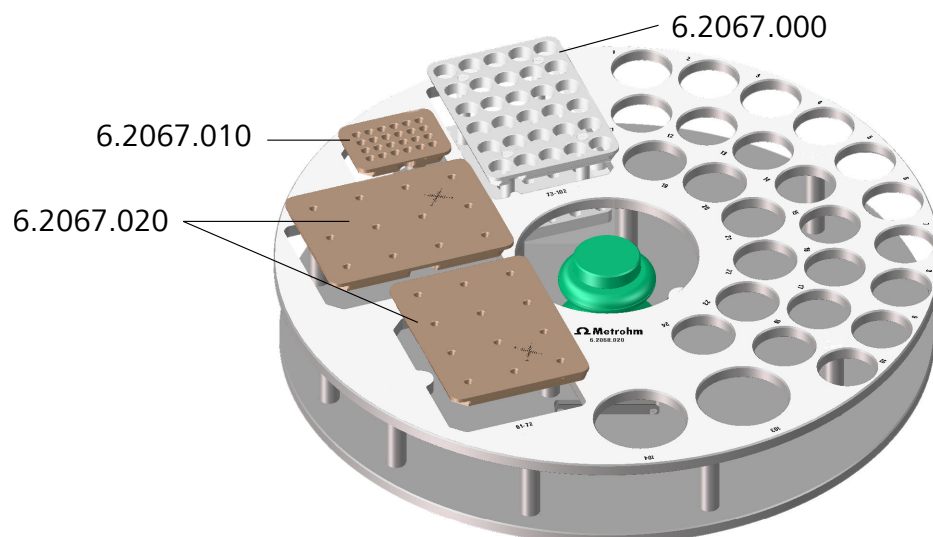
### Preparing the Dosino 2 for diluting

Install the Dosino 2 in the same way as Dosino 1. Use the 50 mL dosing unit. Fill the clear glass bottle with a suitable dilution medium (e.g. water).

- 1 Screw an adsorber tube filled with cotton to the **Vent** connector on the 50 mL dosing unit.
- 2 Equip the dosing unit with a filling tubing (Port 2 on the underside of the dosing unit) and screw it onto a 6.1808.070 clear glass bottle (with GL 45 thread). The bottle should be filled with the dilution medium (e.g. water).
- 3 Connect the inlet tubing on the Polytron robotic arm (tower 2) with the end that is still free to port 3 on the dosing unit.
- 4 Place the Dosino (dosing drive) on the dosing unit.
- 5 Equip the connection cable of the Dosino with an anti-interference adapter made of ferrite (T2400.102) and connect it to the MSB connector 2 (MSB 2) on the rear of the Sample Processor.

## 2.18 Equipping the rack

In addition to sample vessels, the sample rack can also be equipped with various so-called **Inserts**, which can act as receptacles for various utensils.

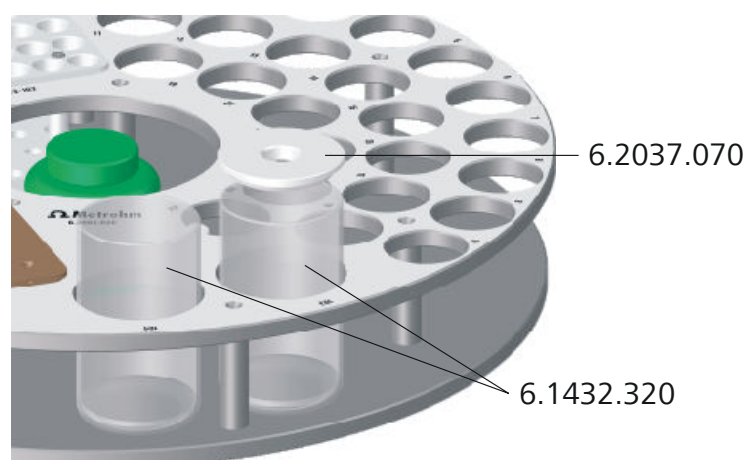


The inserts illustrated above are:

- 6.2067.000 - Insert for 6.2743.050 sample tubes (11 mL)
- 6.2067.010 - Insert for injection needles with Luer connector (maximum length 50 mm)
- 6.2067.020 - Insert for disposable membrane filters with Luer connector (maximum diameter 30 mm). This insert has a positioning reticle for adjusting the rack and the robotic arm.

Each insert is provided with a recess that prevents it from being inserted with the incorrect alignment.

Two positions on the sample rack are reserved for rinsing and waste beakers.





The lid with the hole belongs on the waste beaker (position 103) into which a preliminary filtrate of the sample solution is to be disposed of when membrane filters are used. The filter can be placed on the hole in the lid with the robotic arm and pressure can be applied to force the sample solution through the filter.

The sample beaker can be defined as a special beaker for the purpose of dabbing off the Polytron aggregate if required.

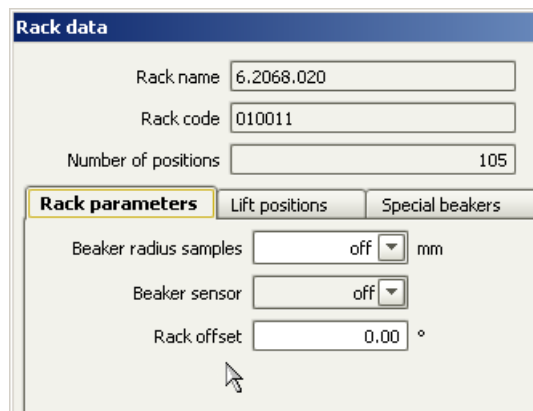
## 3 Defining rack positions



1 In MagIC Net™, select **Configuration**.

2 Double-click on the device name **815 Robotic USB...**

3 Switch over to the tab **Rack** and click on **[Rack data]** to open the rack parameter settings.



**Rack data**

Rack name: 6.2068.020

Rack code: 010011

Number of positions: 105

**Rack parameters** | Lift positions | Special beakers

Beaker radius samples: off mm

Beaker sensor: off

Rack offset: 0.00 °

4 Select the tab **Special beaker**.



## 4 Adjusting rack and robotic arm

The Luer adapter on the robotic arm must be positioned precisely for picking up membrane filters or syringe needles. In order to ensure this, it is necessary to align the sample rack and the robotic arm precisely in relation to one another.

The MagIC Net control software allows the user to enter a so-called "offset" in the configuration of a robotic arm or a sample rack (rack table). This allows fine-tuning to be performed.

The adjustment needs to be made when sample racks with inserts for membrane filters (e.g. 6.2068.020 and 6.2068.030) are used. These inserts feature a "positioning reticule". This is the adjusting position.

### Preparing the Sample Processor

Proceed as follows:

- 1 Put the sample rack in place.

The insert (or the inserts) for membrane filters must be in place.

- 2 Start MagIC Net.

- 3 Open the manual control with a click on the corresponding symbol in the toolbar.



- 4 Select the **Rack** tab under **Device selection ▶ All devices ▶ 815 Robotic USB...**

- 5 Click on **[Initialize rack]**.

The sample rack moves into starting position. The rack code is read and the rack table is loaded.

### Moving to the positioning reticle

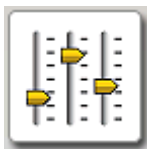
Proceed as follows:

- 1 In the **Manual control** in MagIC Net, switch to the **Tower 1** tab.



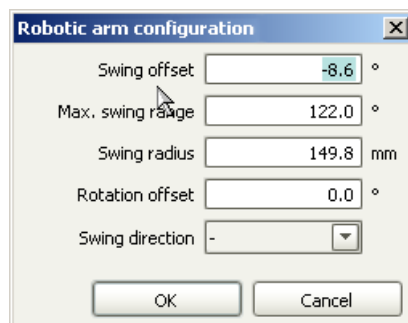
### Correcting the swing offset

If there is a deviation on the **S line**, then proceed as follows:



- 1 Select **Configuration** in MagIC Net.
- 2 Double-click on the instrument name **815 Robotic USB...**
- 3 Switch over to the **Tower 1** tab and open the robotic arm settings with a click on **[Configuration]**.

Confirm the safety prompt with **[Yes]**.



- 4 Correct the value for **Swing offset** according to the observed deviation from the positioning reticle. One tick mark corresponds to approx. 0.5°.
- 5 Close both the robotic arm configuration and the properties dialog of the Sample Processor with **[OK]**.
- 6 In the manual control, select the same rack position again and lower the lift down to the positioning reticle.

Now the adapter tip should point to the middle of the positioning reticle. If this is not the case, then an additional correction must be made and/or the rack offset needs to be corrected.



## 5 Setting lift positions

Various lift positions must be defined before process methods are created for the Soliprep.

The simplest way to accomplish this is by having the individual positions established in MagIC Net™ with the aid of the **Manual control**. The established position can then be assigned to a predefined lift position.

The sample rack must be charged with all of the inserts.

### Preparing



#### 1 Opening the manual control

In the symbol bar of MagIC Net, click the hand symbol.

#### 2 Under **Device selection ▶ All devices**, click on **815 Robotic USB...** and then select the tab **Tower 1**.

### 5.1 Lift position for sample beakers

#### Working height

- 1 Move to sample position 1. Under **Rack position**, enter **Target position 1** and click **[Start]**.
- 2 Fasten a plastic needle to the Luer adapter of the transfer robotic arm.
- 3 Move the lift downward until the needle is at a suitable height for aspiration of the dispersed sample. Under **Lift position** click on the arrow button **[Arrow down]** and also (if required) **[Arrow up]** in order to set a suitable position.
- 4 Click on **[Configure rack]**.



- 5 Under **Lift position**, select **Work position for tower**, if this is not yet selected.
- 6 Click on the associated **[Assign]** button.
- 7 Click on **[Close]**.
- 8 Remove the needle from the Luer adapter.

## 5.2 Lift position for picking up needles and filters

### Picking up the needle

- 1 Move to a rack position 25. Under **Rack position**, enter **Target position 25** and click **[Start]**.
- 2 Place a plastic needle in the position established in the insert.
- 3 Move the lift downwards until the Luer adapter engages the needle and it is fixed in place. Under **Lift position** click on the arrow button **[Arrow down]** in order to set a suitable position.

The needle must rest up close against the adapter. The lift may not however be lowered too far, because otherwise the lift drive could become overloaded and suffer damage.

- 4 Note the current lift position (in mm).  
This lift height must be entered in the method as absolute lift position.

- 5 Move the lift upward and remove the needle.

### Picking up the filter

- 1 Move to rack position 49. Under **Rack position**, enter **Target position 49** and click **[Start]**.
- 2 Place a membrane filter on the established position in the insert.
- 3 Move the lift downward until the Luer adapter engages the filter and it is fixed in place. Under **Lift position** click on the arrow button **[Arrow down]** in order to set a suitable position.  
  
The filter must rest up close against the adapter. The lift may not however be lowered too far, because otherwise the lift drive could become overloaded and suffer damage.
- 4 Note the current lift position (in mm).  
  
This lift height must be entered in the method as absolute lift position.
- 5 Move the lift upward and remove the filter.

## 5.3 Lift positions for special beakers

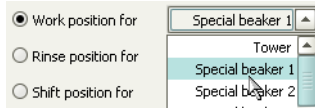
### Special beaker 1

- 1 Move to special beaker position 1. Under **Rack position**, enter **Target position 103** and click **[Start]**.
- 2 Place a sample beaker on the established position. Lay the cover with the hole on the sample beaker.
- 3 Fasten a membrane filter on the Luer adapter of the transfer robotic arm.
- 4 Move the lift downward until the filter rests against the cover of the sample beaker. Under **Lift position** click on the arrow button **[Arrow down]** in order to set a suitable position.



5 Click on **[Configure rack]**.

6 Under **Lift position** select the **Work position for Special beaker 1**.



7 Click on the associated **[Assign]** button.

8 Click on **[Close]**.

9 Move the lift upward and remove the membrane filter.

### Special beaker 2

1 Move to special beaker position 2. Under **Rack position**, enter **Target position 104** and click **[Start]**.

2 Place a sample beaker on the established position.

3 Move the lift downward until the Luer adapter arrives at a suitable position for rinsing the transfer tubing. Click on the arrow button **[Arrow down]** and also (if required) **[Arrow up]** under lift position in order to set a suitable position.

4 Click on **[Configure rack]**.

5 Under **Lift position** select the **Work position for Special beaker 2**.

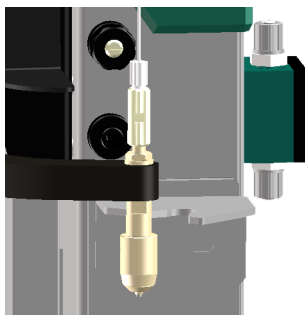
6 Click on the associated **[Assign]** button.

7 Click on **[Close]**.

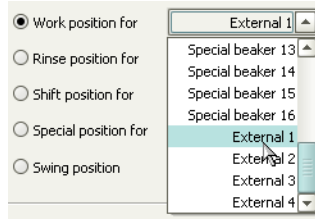
## 5.4 Lift positions for stripping needles and filters

### External position 1

- 1 Under **Device selection** ► **All devices**, click on **815 Robotic USB...** and then select the tab **Tower 1**.
- 2 Fasten a plastic needle or a membrane filter to the Luer adapter of the transfer robotic arm.
- 3 Under **Robotic arm position** actuate the button **[Arrow right]** until the Luer adapter is approximately 2 cm in front of the deflector.
- 4 Move the lift downward until the thick sleeve of the Luer adapter is approximately 1 cm underneath the deflector. Click on the arrow button **[Arrow down]** and also (if required) **[Arrow up]** under lift position in order to set a suitable position.



- 5 Click on **[Configure rack]**.
- 6 Under **Lift position** select **Swing position External positions**.
- 7 Click on the associated **[Assign]** button.
- 8 Under **Robotic arm position** select **External position 1**.
- 9 Click on the associated **[Assign]** button.
- 10 Under **Lift position** select the **Work position for External 1**.

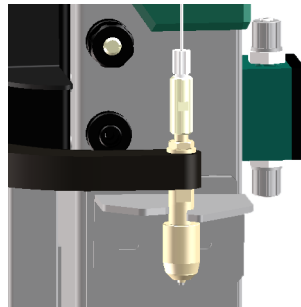


**11** Click on the associated **[Assign]** button.

**12** Click on **[Close]**.

**External position 2**

**1** Under **Robotic arm position** actuate the button **[Arrow right]** until the Luer adapter is standing to the right. It should now be located in the of the deflector opening.



**2** Move the lift upward (arrow button **[Arrow up]**) until the needle or the filter is stripped off and falls into the collection container. Do not move the lift too far upward.

**3** Under **Robotic arm position** select **External position 2**.

**4** Click on **[Configure rack]**.

**5** Under **Lift position** select the **Work position for External 2**.

**6** Click on the associated **[Assign]** button.

**7** Click on **[Close]**.

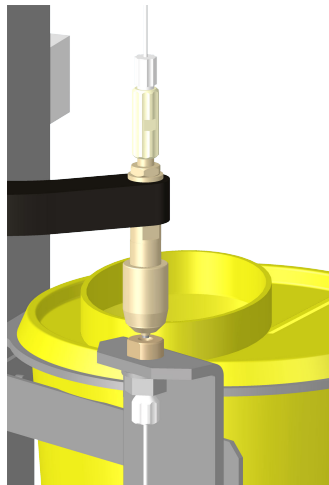
**8** Move the lift to the **Shift position**.

- 9 Under **Robotic arm position**, as **Target position** select **External 1** and click on **[Start]**.

## 5.5 Lift position for the Luer connector

### External position 3

- 1 Under **Device selection** ► **All devices**, click on **815 Robotic USB...** and then select the tab **Tower 1**.
- 2 Under **Robotic arm position** actuate the button **[Arrow right]** until the Luer adapter is located above the Luer connector.
- 3 Move the lift downwards until the Luer adapter is located approx. 1 mm above the Luer connector.
- 4 Under **Robotic arm position** actuate the arrow buttons **[Arrow left]** and **[Arrow right]** until both components fit to one another in the middle.



- 5 Click on **[Configure rack]**.
- 6 Under **Robotic arm position** select **External position 3**.
- 7 Click on the associated **[Assign]** button.
- 8 Click on **[Close]**.



### Work position

- 1 Move the lift upwards by several mm.
- 2 Fasten a membrane filter to the Luer adapter of the robotic arm.
- 3 Under **Lift position** actuate the arrow key **[Arrow down]** several times until the membrane filter is tightly placed on the Luer connector.
- 4 Click on **[Configure rack]**.
- 5 Under **Lift position** select the **Work position for External 3**.
- 6 Click on the associated **[Assign]** button.
- 7 Click on **[Close]**.
- 8 Move the lift to the **Shift position** and remove the membrane filter from the Luer adapter.

## 5.6 Lift position for the Polytron

### Working height

- 1 Under **Device selection ▶ All devices**, click on **815 Robotic USB...** and then select the tab **Tower 2**.
- 2 Move to sample position 1. Under **Rack position**, enter **Target position 1** and click **[Start]**.
- 3 Move the lift downward until the Polytron is at a suitable height for sample dispersion. Click on the arrow button **[Arrow down]** and also (if required) **[Arrow up]** under lift position in order to set a suitable position.
- 4 Click on **[Configure rack]**.

- 5 Under **Lift position**, select **Work position for tower**, if this is not yet selected.
- 6 Click on the associated **[Assign]** button.
- 7 Click on **[Close]**.

## 5.7 Lift position for the washing station

### External position 1

These settings apply to tower 2.

- 1 Move the lift upward until the Polytron is at a suitable height for swinging to the washing station. Click on the arrow button **[Arrow down]** and also (if required) **[Arrow up]** under lift position in order to set a suitable position.
- 2 Under **Robotic arm position** click on the button **[Arrow left]** until the robotic arm stops.
- 3 Click on **[Configure rack]**.
- 4 Under **Robotic arm position** select **External position 1**.
- 5 Click on the associated **[Assign]** button.
- 6 Click on **[Close]**.

### Work position

- 1 Under **Robotic arm position** select **External 1** and click on **[Start]**.
- 2 Move the lift downwards (button **[Arrow down]**) until the Polytron is at the right height for rinsing.  
  
If the Polytron does not fit in the middle of the washing station, then the latter can be shifted laterally.
- 3 Click on **[Configure rack]**.



**4** Under **Lift position** select the **Work position for External 1**.

**5** Click on the associated **[Assign]** button.

**6** Click on **[Close]**.

## 6 Controlling the Polytron®

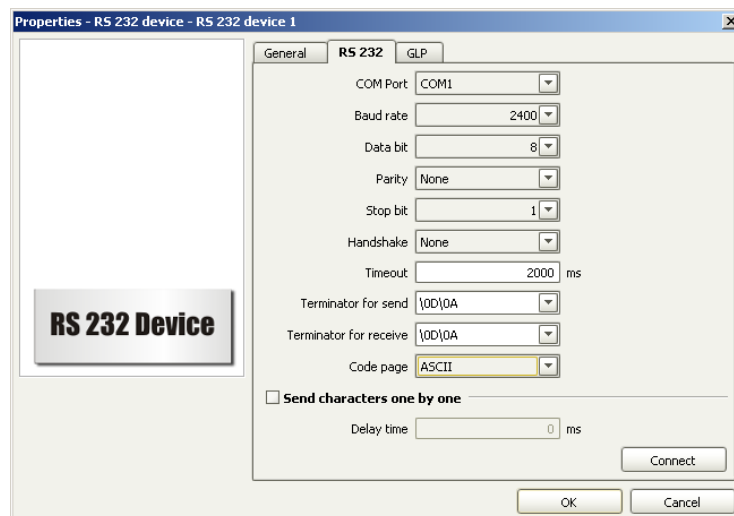
### Configuration

Once the Polytron has been set up, it can be configured in MagIC Net.

#### Configuring the Polytron



- 1 Click on the **Configuration** symbol.
- 2 Click on **[Edit]** in the **Devices** window.
- 3 Select the entry **New...** in the pull-down menu and then set up a new **RS 232 device** in the device selection under **Miscellaneous**.
- 4 Enter a device name and the device serial number of the Polytron under **General**.



- 5 Enter the following settings in the **RS 232** dialog window:
  - COM Port = **COM1** (i.e. the interface on the PC to which you have connected the Polytron)
  - Baud rate = **2400**
  - Data bit = **8**
  - Parity = **none**
  - Stop bit = **1**



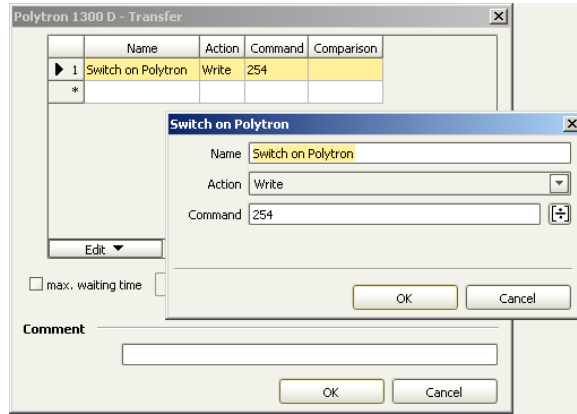


Table 1 Switching the Polytron 1300 D on and off

Command no.	Function
254	On
253	Off

After having received the command '254', the Polytron starts rotating at the speed that was last set. When the device is switched off, the currently set value is saved as setpoint value.

Table 2 Setting the setpoint value

Command no.	Setpoint value
000	2,000 rpm
001	2,200 rpm
002	2,400 rpm
003	2,600 rpm
004	2,800 rpm
005	3,000 rpm
006	3,200 rpm
015	5,000 rpm
040	10,000 rpm
065	15,000 rpm
090	20,000 rpm
115	25,000 rpm
140	30,000 rpm

The current rotational speed of the Polytron can be queried with a command. The Polytron then sends a response code representing the averaged



actual value. The **Read** option must be enabled in the TRANSFER command. The response code of the Polytron must be assigned to a previously defined method variable.

Table 3 Querying the current rotational speed

Command no.	Function
252	Querying the actual value.

Table 4 Conversion table for the actual value

Response code		Actual value
0	corresponds to	2,000 rpm
1	...	2,200 rpm
2	...	2,400 rpm
...		...
140	...	30,000 rpm
141	...	< 2,000 rpm
142	...	> 30,000 rpm

Table 5 Querying the current status

Command no.	Function
143	Querying the status.

Table 6 Status table

Response code		Status
150	corresponds to	Motor off
151	...	Motor on
152	...	Motor overloaded
153	...	Motor overheated
154	...	Amplifier not ready
155	...	Device overheated
156	...	Wrong operating voltage
157	...	Other error

Table 7 Query whether setpoint speed has been achieved

Command no.	Function
144	Speed achieved

Table 8 Status table

Response code	Status
170	corresponds to No
171	... Yes



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