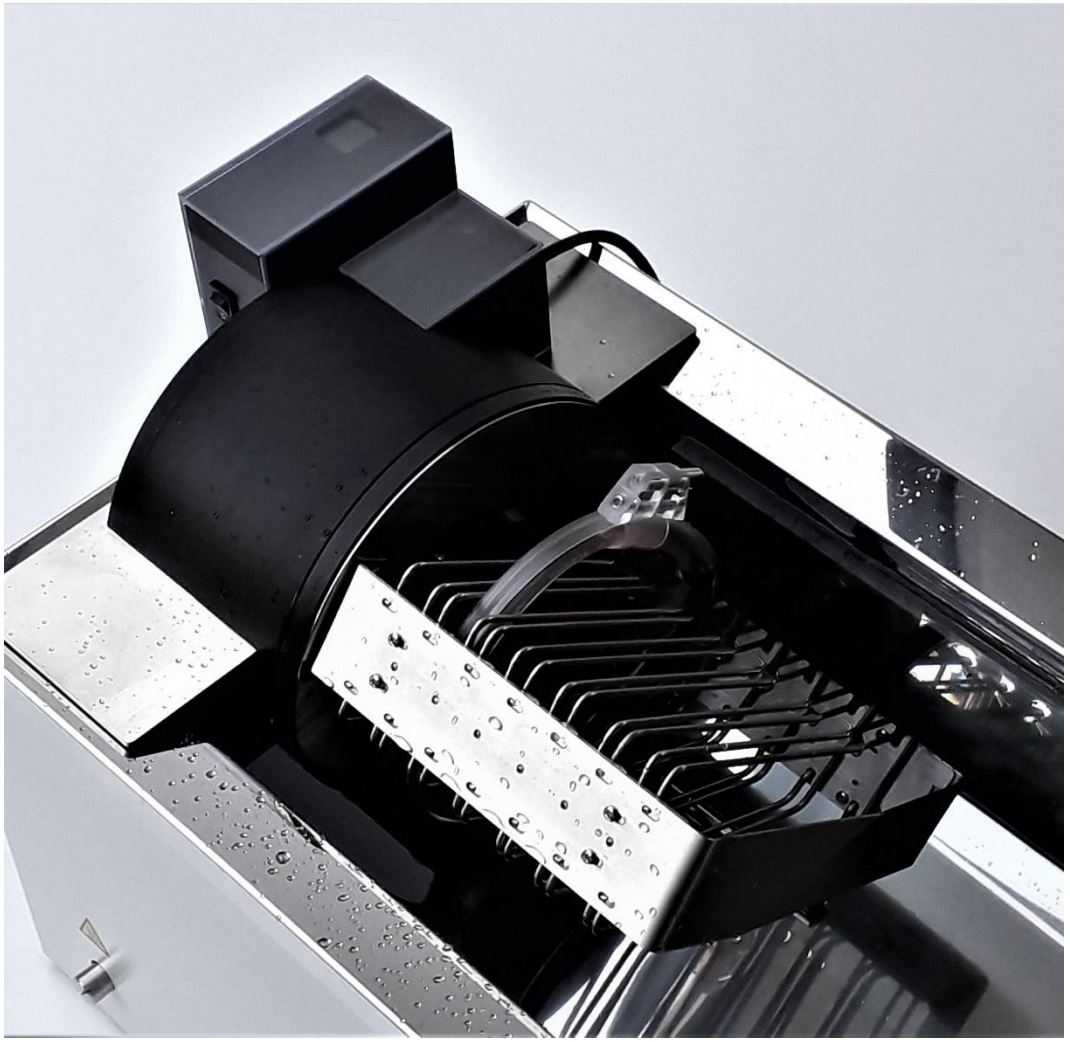

Chandler Loop System

Instruction Manual

Please read the instructions carefully
before operating the device,
as this will ensure safe and correct use.

This manual forms a part of the product
and should be kept easily accessible for anyone,
carrying out the installation,
servicing, maintaining or cleaning of the device.

01 / **2026** updates: www.chandlerloop.com

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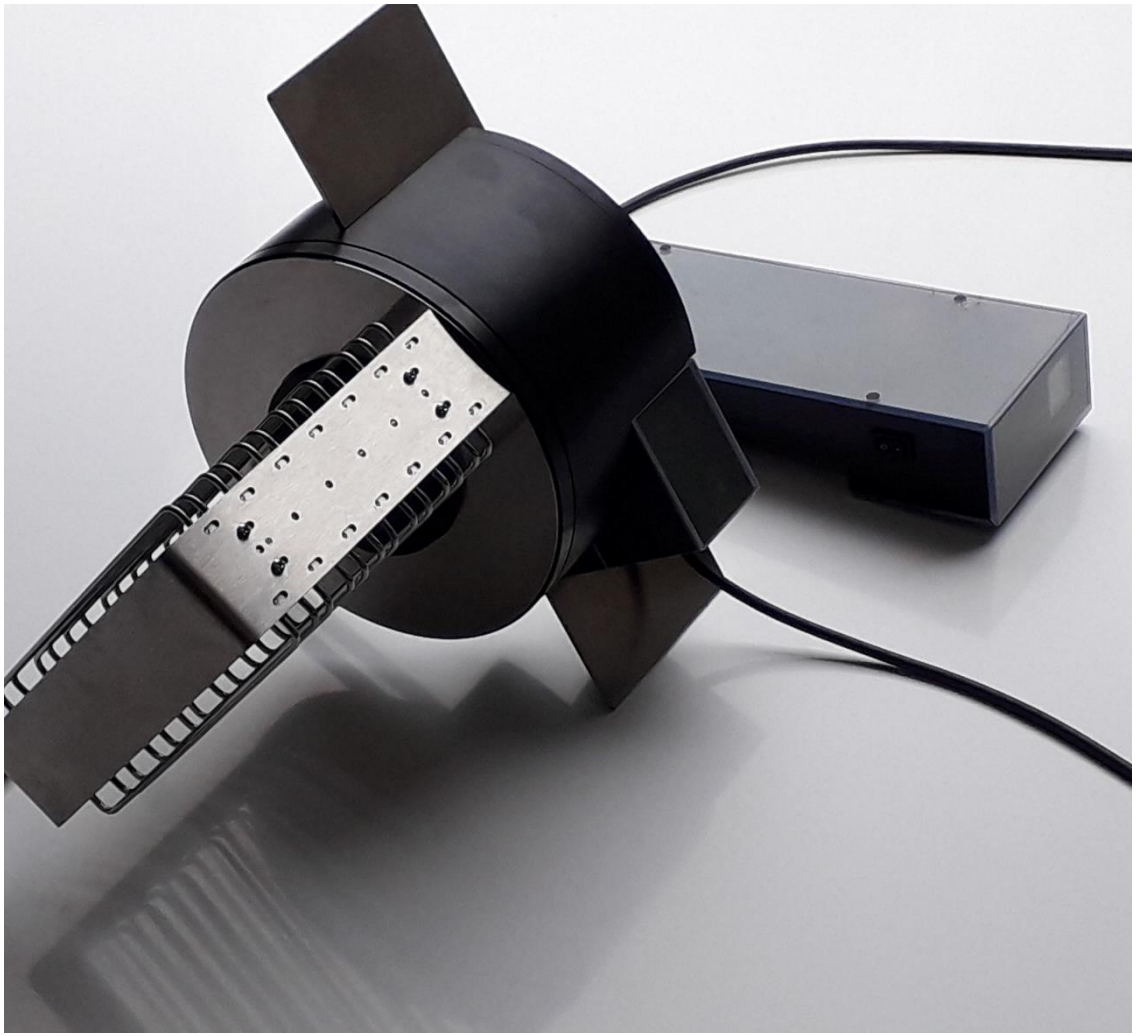
1 Intended use

The Chandler Loop System is an experimental platform for hemocompatibility testing of artificial materials and surfaces by in–vitro simulation of the human blood circulation.

It is for analytical testing only.
It is not for human or animal diagnostic use.
It is no medical device.

Due to the dangers deriving from working with blood, the equipment is intended to be used only by certified professionals, working under conditions which conform to Good Laboratory Practise (GLP).

Don't use the device for anything else.



2 System Components

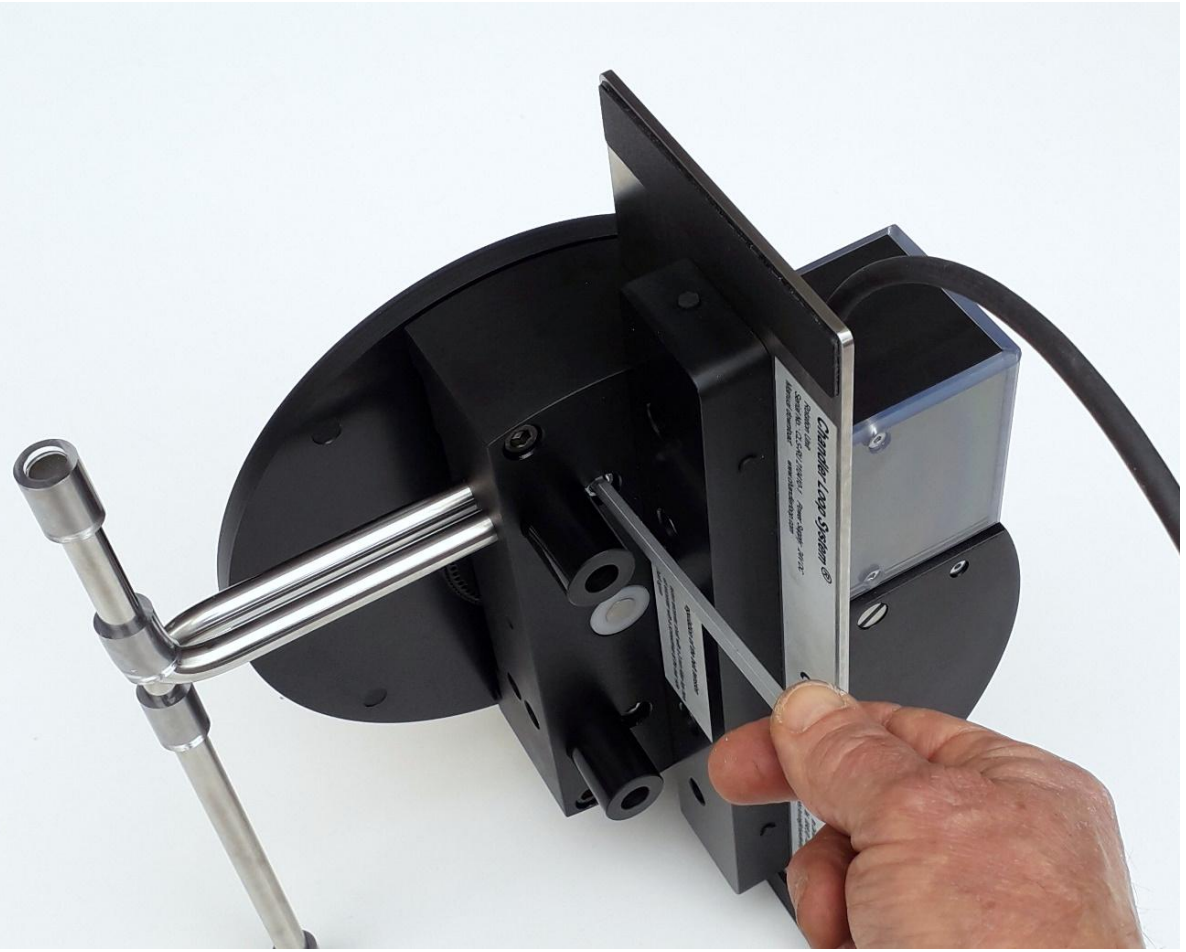
The Chandler Loop System can be operated either in a water bath or in an incubator to control the temperature of the blood-filled loops.

The motion controller is separated from the drive unit. Using an incubator, the control unit remains outside, accessible for operation.

The two components are connected by a cable.

2.1 Rotation Unit

The rotation unit is delivered
in a stable and compact transport position.



2.1 Rotation Unit

On the underside, there are adjustable metal brackets as stands.
Their position can be fixed with the associated screws.

2.1 Rotation Unit

For the use in a water basin, set the position of the metal brackets according to its height and tighten the screws.

2.1 Rotation Unit

The drive is inserted into the water bath from above.
Fastening is not necessary

2.1 Rotation Unit

For incubator setup, please arrange the brackets as shown.
Alternatively, the rotation unit can be also placed mirror-inverted
at the left side of the loop cradle, using the other pair of mounting holes.
In this case, the cable entry is from above.

2.1 Rotation Unit

The connector is reverse polarity protected and can only be inserted in one position.

2.2 Controller

The plug goes into the
rear opening of the controller housing,
screwed to the connector socket

2.2 Controller

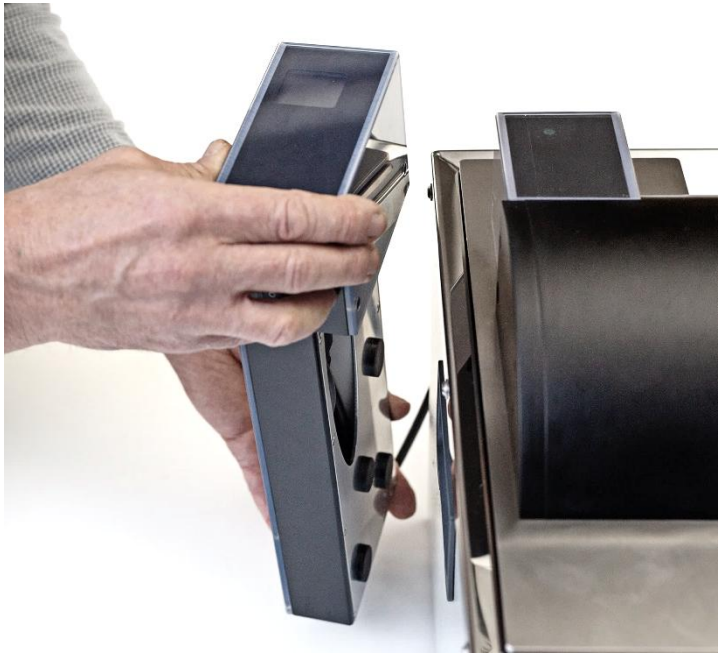
If necessary, the cable can be housed inside the controller.

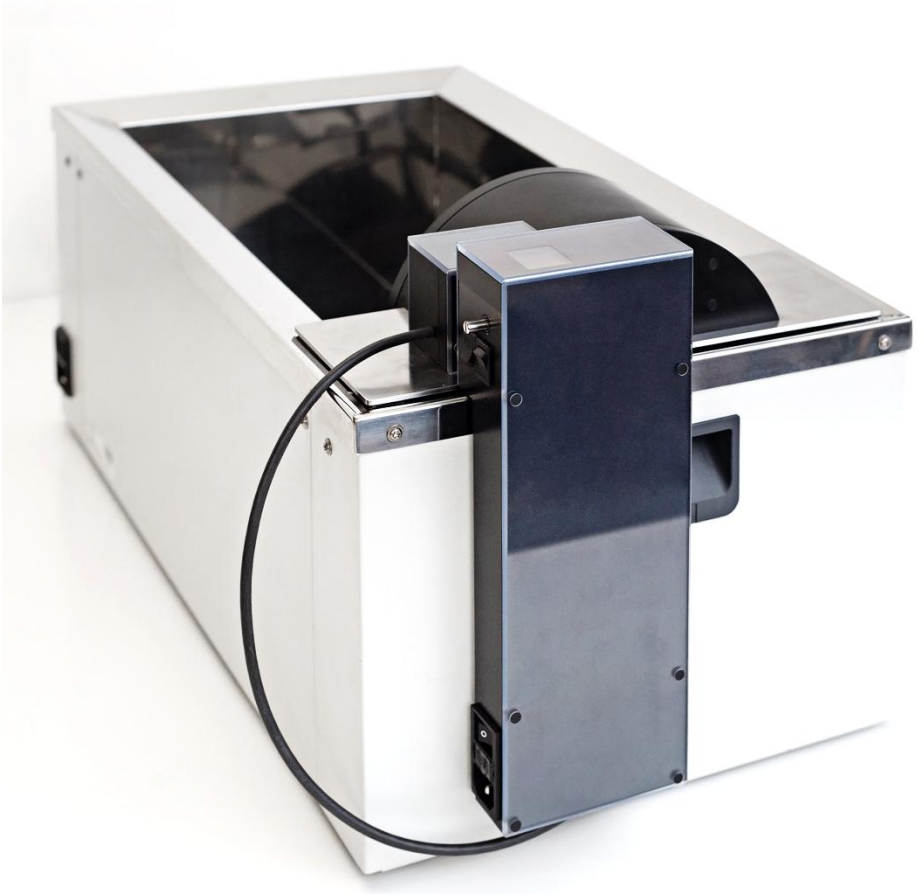
2.2 Controller

Lose magnets guarantee a secure mechanical connection with the water bath..

2.3 Connecting the parts

The position of the controller can be chosen
depending on the space available at the installation site.





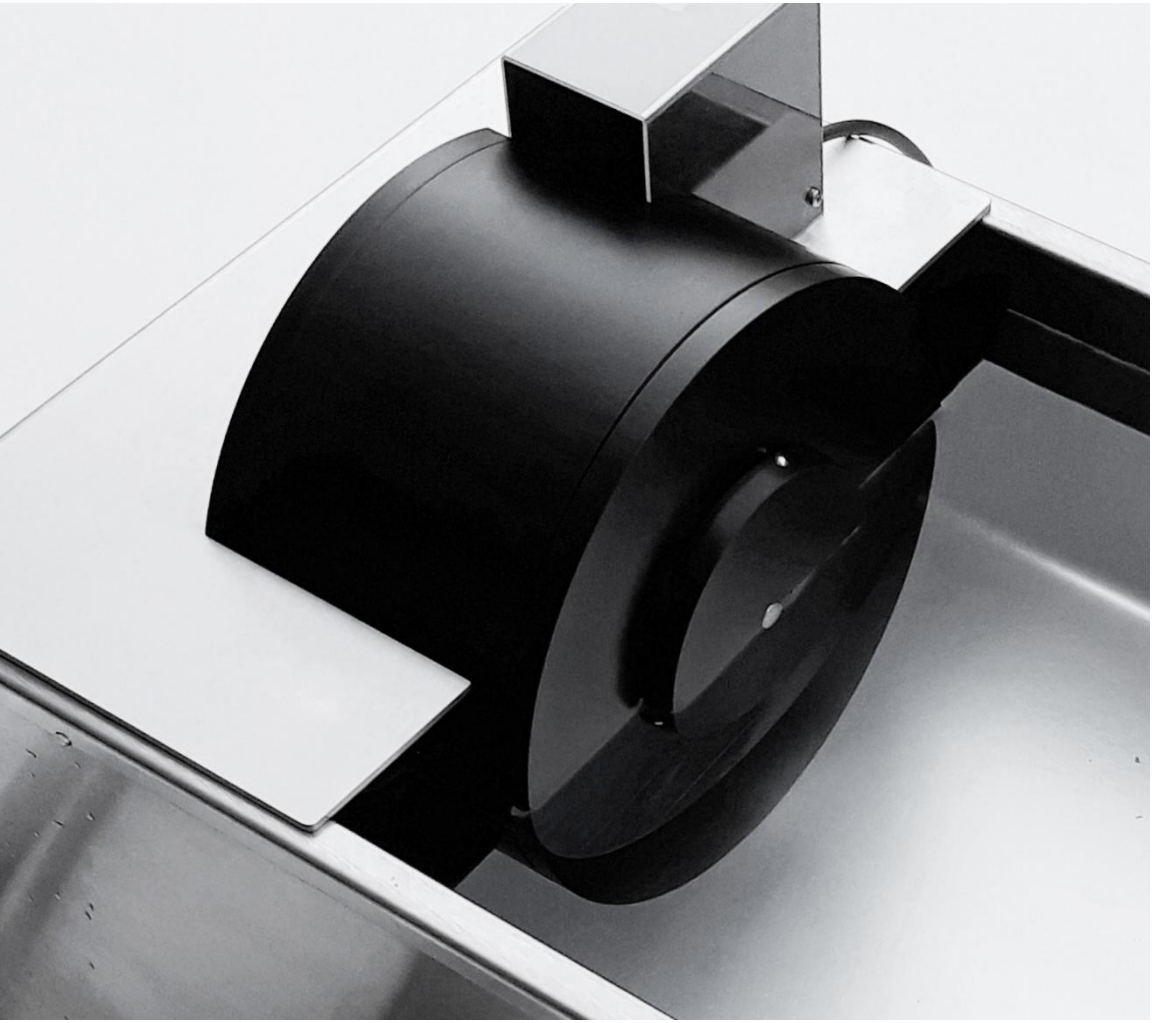
2.4 Power supply

The device comes with a power plug that has an earth leakage circuit breaker included.
To start push the green button.
Pushing the blue button will interrupt the power supply.

Like every electrical equipment, which runs with a net power supply, care must be taken to operate the device safely.

Don't dunk it into water.
Don't operate it in explosive environment.
Only connect it to a properly installed and sufficiently fused socket with protective contact.
Be aware, that the cable doesn't create any danger.
Keep the cable away from heat sources and sharp edges.
Avoid tripping hazards.
Disconnect the power supply before opening the body.

Check the basin for visible damage before use. All parts, especially the parts of the electrical power supply must be in proper working conditions.
If anything is damaged or you are unsure about operation, please switch off the device and contact the service provider.



3 Operation

3.1 Filling with water

Before filling the water bath, always check that the drain tap on the front of the device is closed.

Fill the device with clean tap water. The stainless steel tub holds approx. 22 l.

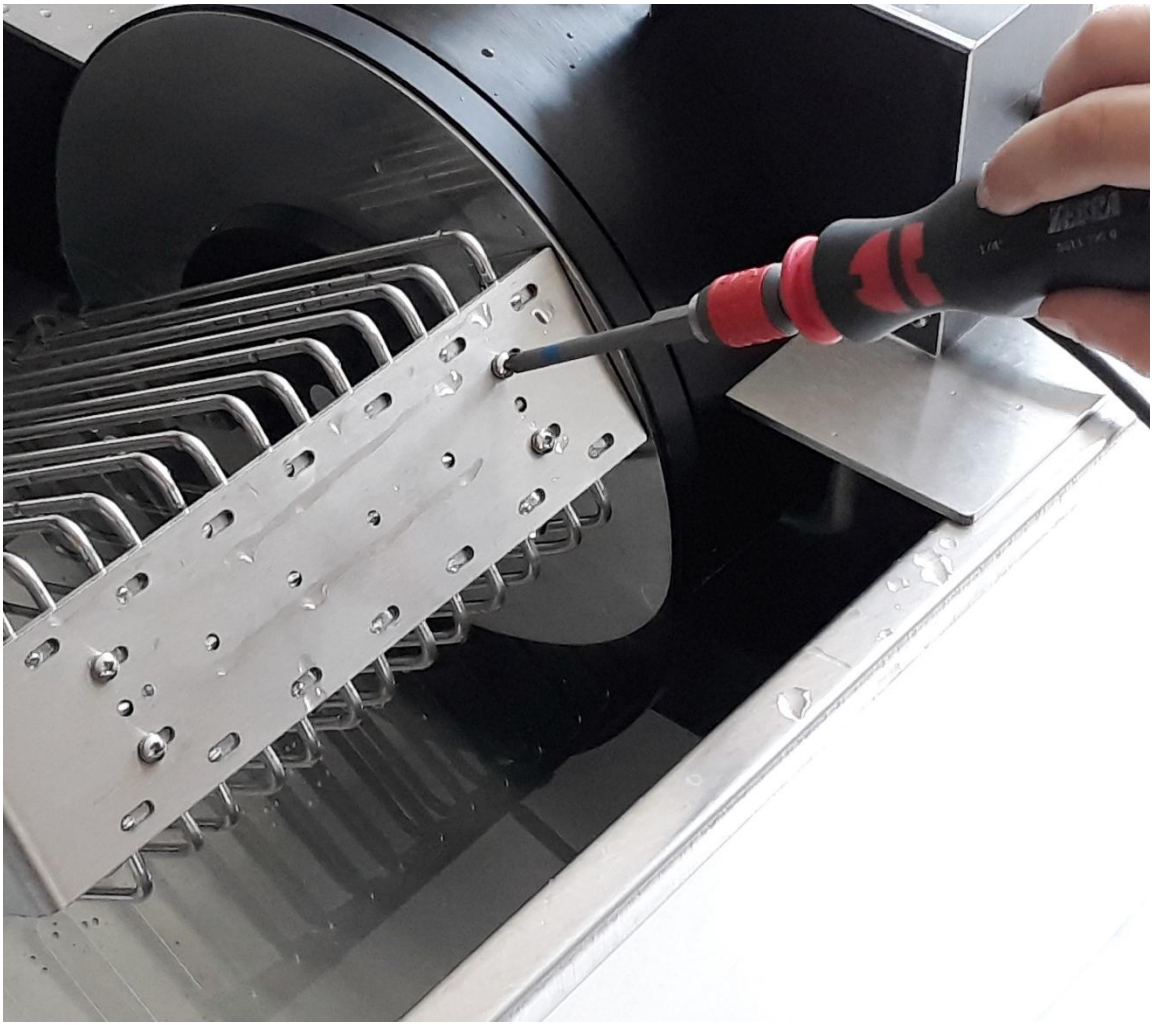
The correct filling level corresponds to the axis of the rotation unit’s drive wheel. Part of the water filling evaporates during operation , therefore attention should be paid to the correct filling level.

Adding a small amount of citric acid E-330 prevents the stainless steel parts from calcification.

3.2 Connecting cradle with rotation unit

The loop cradle is coupled to the rotation unit’s drive wheel by a snap connection.

No tools are required. Simply pull off for removal in the direction of the rotation axis.



3.3 Adjusting the cradle slots

The cradle slots can be adjusted, according to the dimension of the tubing.

Every second wire frame is connected to the movable frame part. Loosen slightly the four screws on every side for adjustment.

When choosen the right slot width the loops can be easily placed in and moved my hand. Still they are fixed safely during the rotation process.

The stiffness of the loops is temperature-dependent, this is why the cradle slots should be adjusted with warmed-up water basin.

3.4 Placing loops

The device poses minimum danger to the hand and fingers of the operator as it has a slip clutch between the driving wheel and the loop cradle.

The rotation process must not be running when placing and replacing the loops.

3.5 Starting the rotation

The motor runs with a gentle start up and has a safety clutch for torque control.

With turning on the rotation unit, the tachometer will display the measured speed. The rotation speed is variable between 6 and 40 R / min.

Always stop the rotation process while placing and replacing the loops.

The water basin and the surface of the device will only be hand warm. There is no risk of burns.

To finish working with the device, simply switch off the red power supply at the rear.

The water may remain in the basin.

3.6 Setting the speed

There are two different ways to regulate the speed:
the hand control,
or very precisely with a small flat-blade screwdriver.
In this way, the default rotation speed is protected against unintentional adjustment
To chose between the two possibilities, use the toggle switch between.
The second switch is for hardware extensions and currently has no assigned function.

4 Accessories

4.1 Circular tube cutter

The cutter is intended to be used to cut polymer PVC-P tubes of up to 16 mm diameter.

Do not use the cutter for anything else.

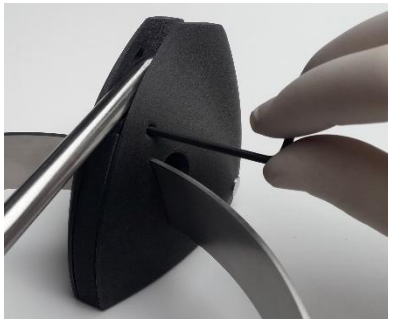
The cut is made radial to the curvature of the wrapped tube. The result is a very smooth cut surface. The cutted tube-endings fit accurate and interlocking together.

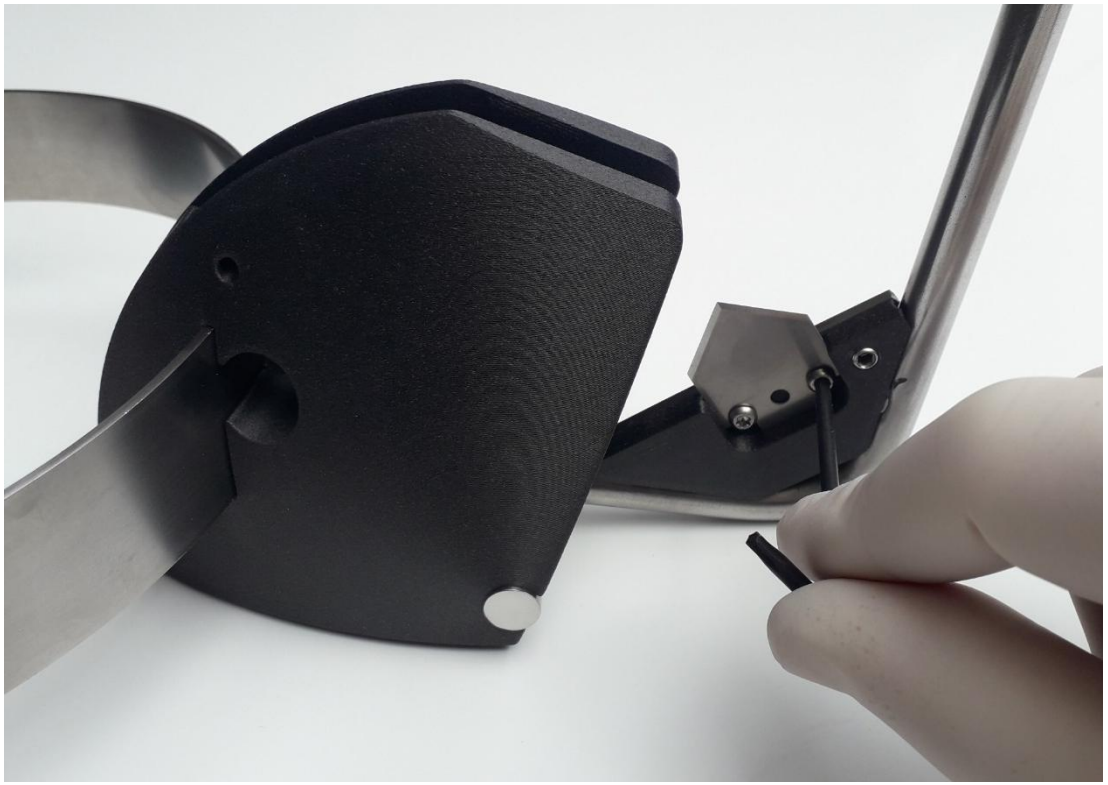
.

4.1 Circular tube cutter

Adjustable stop

The stop for the tube ending is adjustable for aprecise reproduction of the tube length.
The metal bracket can be dismounted to carry spacers of different dimensions and shapes according to the tube size.





4.1 Circular tube cutter

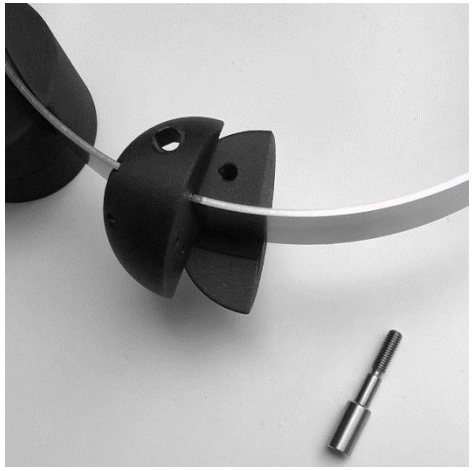
Blade change

For good cutting results and safe operation always use sharp blades.
The QR code inside the steelring leads you to a detailed manual.

To change the blade unscrew the stop counterclockwise 6 turns
like shown in the top picture. You can now fold the lever aside.
Loosen the two fixing screws only a bit and don‘t unscrew them all the way.

Careful!! Risk of injury!!
The blade tip is very sharp.

The blades have a very long service life when used correctly.



4.1 Circular tube cutter

For sterilization, the cutter can be completely dismounted.

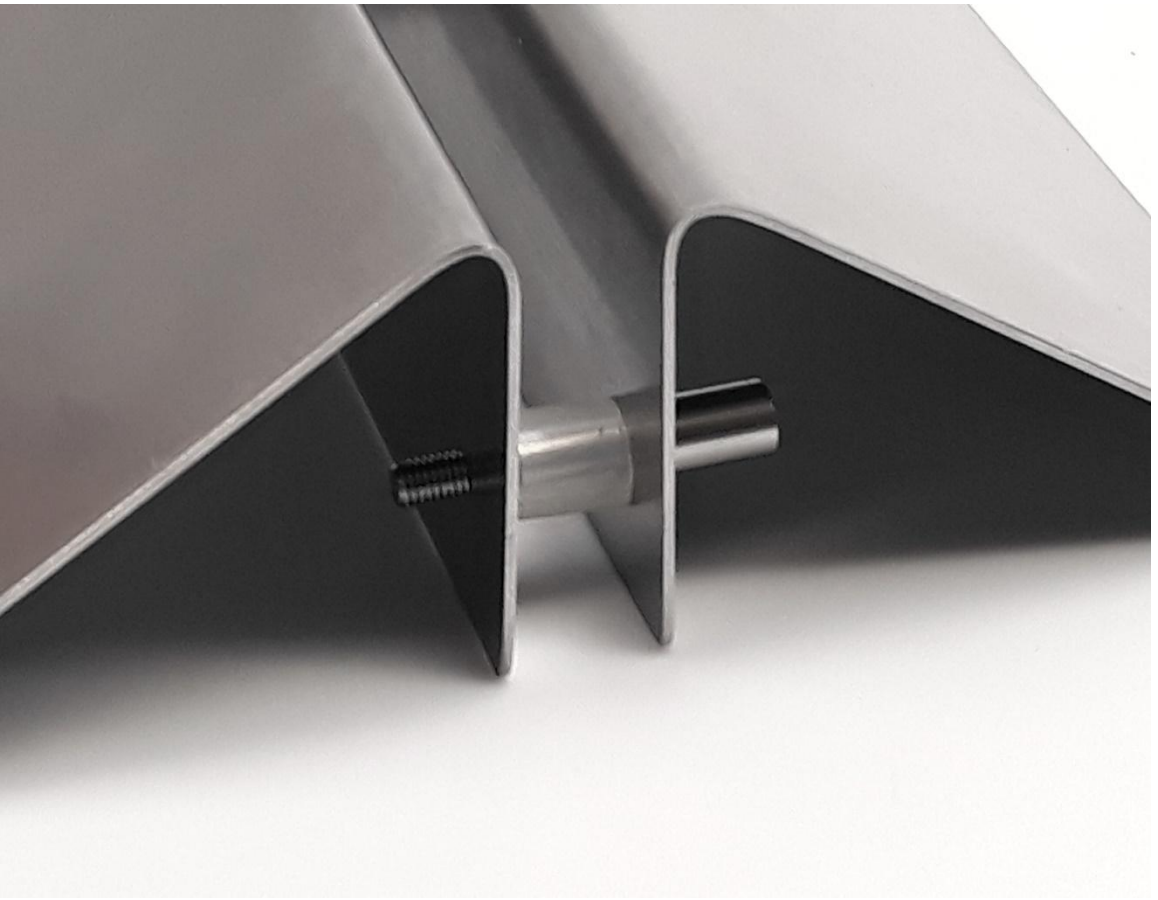
Very Important:
Always start with the removal of the blade,
as shown overleaf !

4.2 Tube connector

The tube connector is a technological development of the conventional connection of tubes with a short piece of bigger sized tubing. An additional polycarbonate tension band around the loop leads to perfect fit and sealing at the splice. Its length can be varied and adjusted. A regulation of the closing force at the sealing surfaces is implemented.

The stand makes the filling of the tubes much easier.

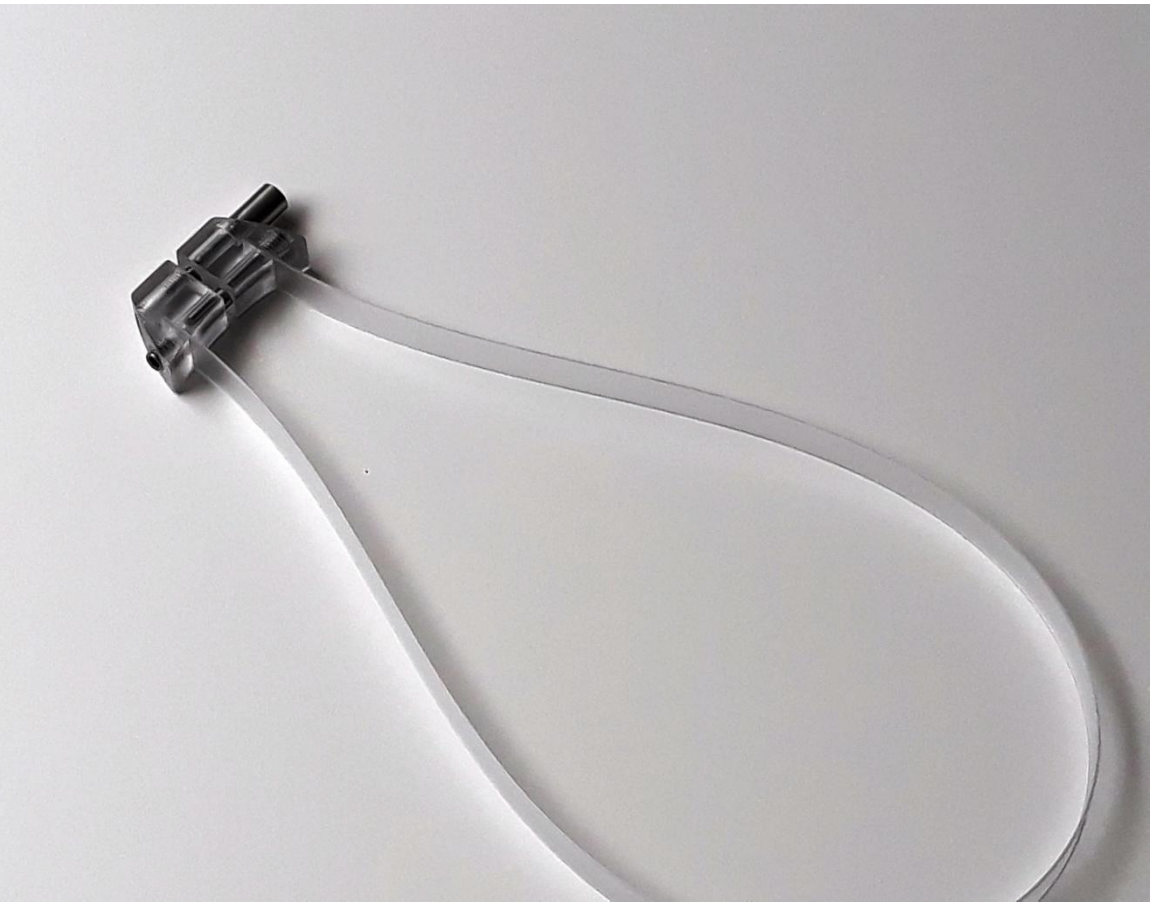
4.2 Tube connector



Loop stand setting

The slotwidth of the loop stand depends on the tension of the screw and the piece of tubing between. Both can be varied according to the requirements.

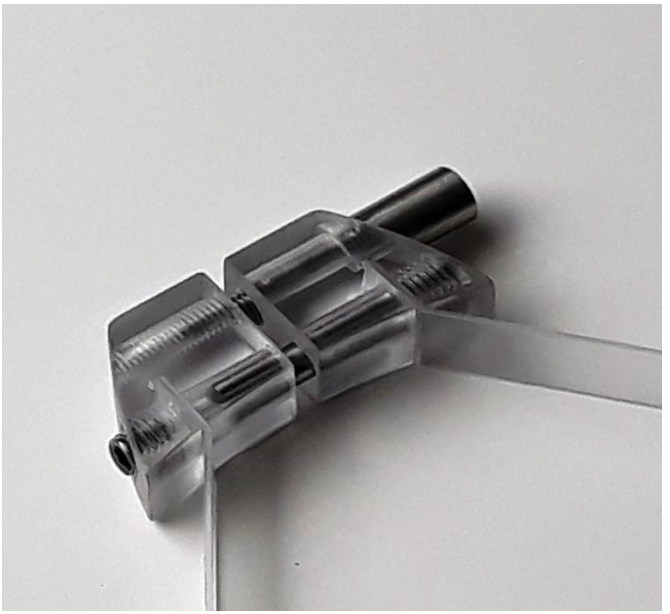
4.2 Tube connector

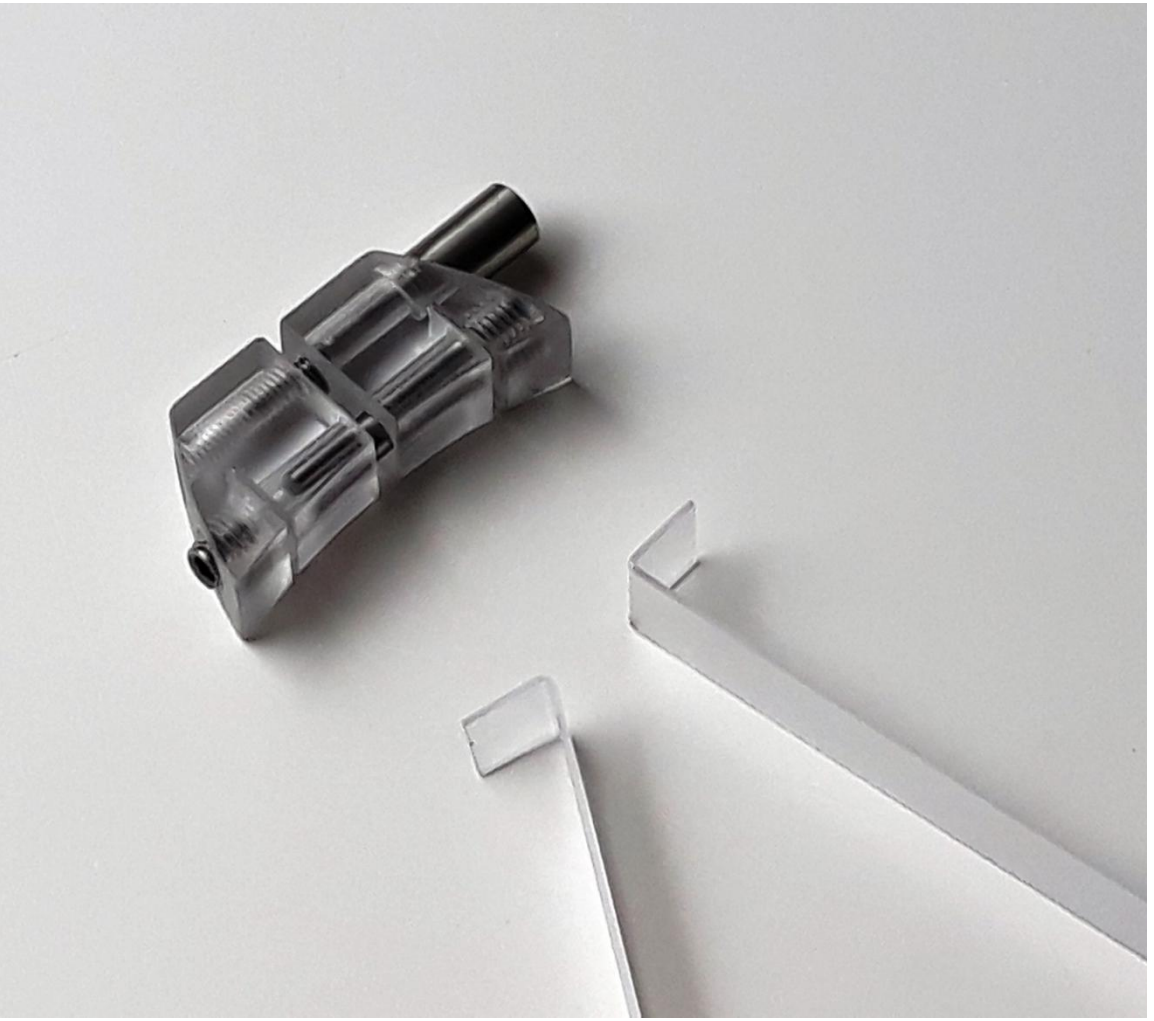


Preparation of the polycarbonate strip

Cut the polycarbonate strip with a pair of scissors ca.10 mm longer than the tube and insert the ends into both slots.

Kink the strip by hand.



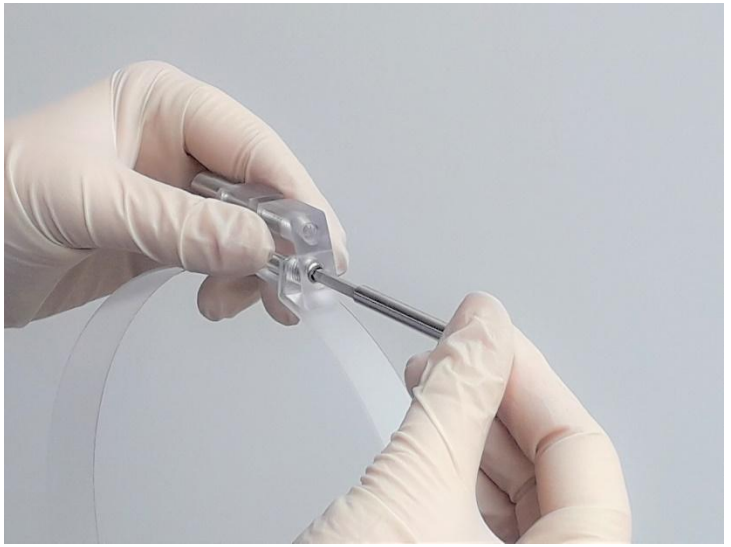


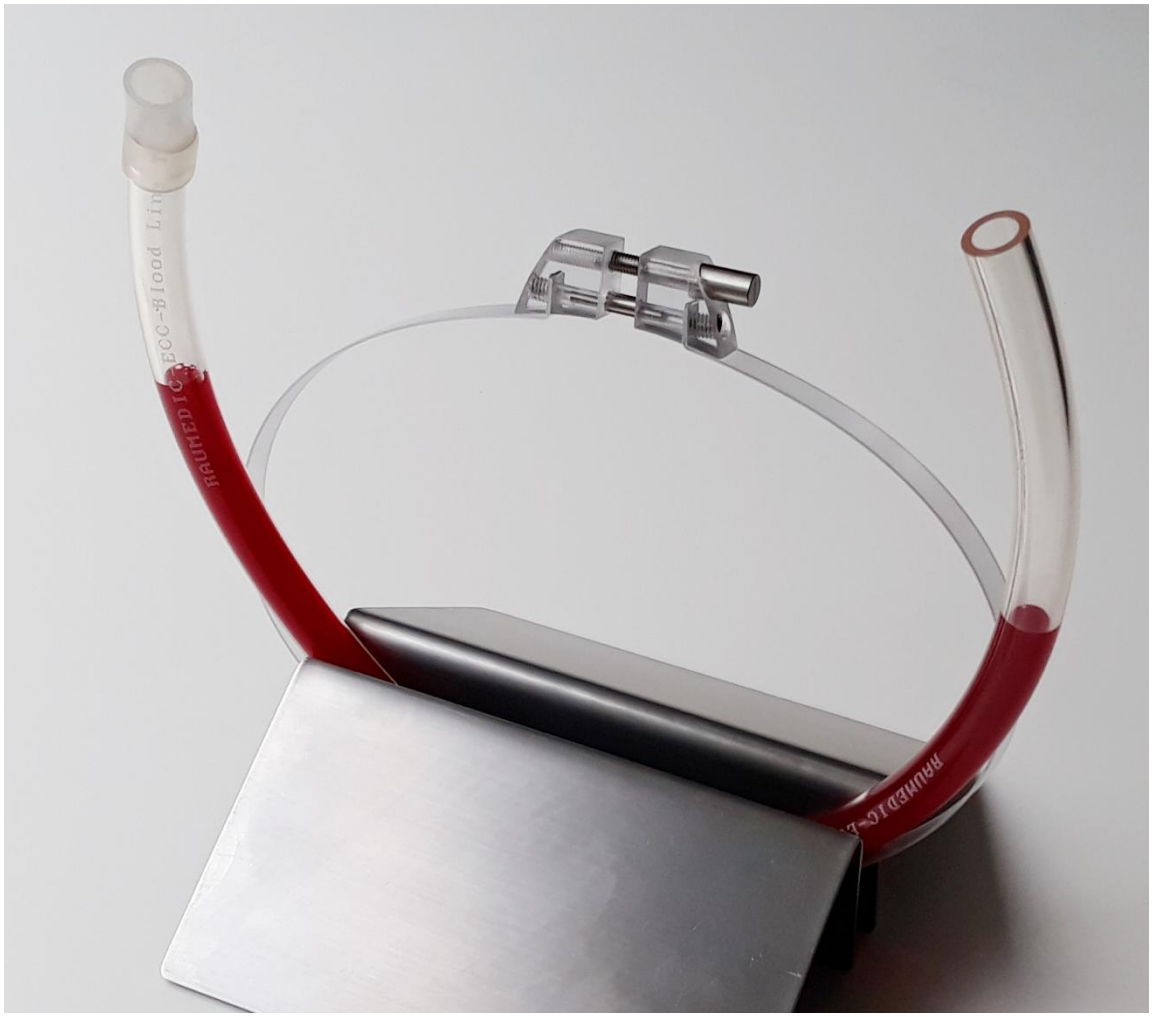
4.2 Tube connector

Preparation of the polycarbonate strip

Remove the strip and intensify the kink.

Insert the ends again and fix both with the screws.
It’s enough, to tighten the screws slightly (< 0,3 Nm). Distortion can damage the plastic body. Use the supplied pin wrench to limit the torque to the correct limit





4.2 Tube connector

Closing the tube

Place the tension ring in the stand. Set the tubing and slip the short connecting tube over one end.

Now the blood can be filled in.

4.2 Tube connector

close the tubing with the connecting tube

press the loop inside the tension ring

4.2 Tube connector

Tightening the strap

The tension can be regulated by the screw.
The endings of the tube should be moved and pressed together by hand first.

5 Cleaning and maintenance

The system is designed to withstand usual laboratory cleaning procedures.

All metal parts are made by stainless CrNi steel.

All transparent parts are from polycarbonate polymer PC which is resistant to alcohol (but not to methyl-alcohol) and temperatures up to 120° C.

All black polymer parts are from laboratory conform PVC-U.

All white parts of the bearing are from laboratory conform POM.

Do not dunk the electrical parts into water !!!

Adding one teaspoon of citric acid E-330 to the water in the basin keeps the whole device clean and neutralizes the stainless steel.

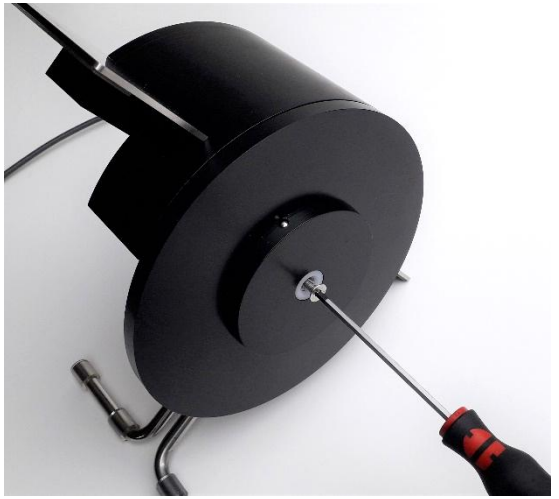
The use of a stainless steel care spray like SABESTO Art. 0893221 or a similar product would help maintain the steel and PVC-U surfaces.

The circular cutter, the cradles and clamps can be sterilized.

6 Troubleshooting

A small clockwise turn increases the belt tension

6 Troubleshooting



After loosening the center screw,
the drive wheel can be taken off for inspection

For renewed installation carefully lift the wheel on the axle with both hands. Gently push the drive belt onto the drive wheel with your fingertips by moving back and forth.

Do not use any tools.
Tighten the screw only slightly.
Lubrication is not required.

The 24 V DC voltage supply is fused with 1.6 A.
Attention!
A blown fuse always indicates a serious problem with the device.
The replacement of the fuse must always be preceded by searching for the fault and its elimination.
The device may only be opened by qualified personnel.

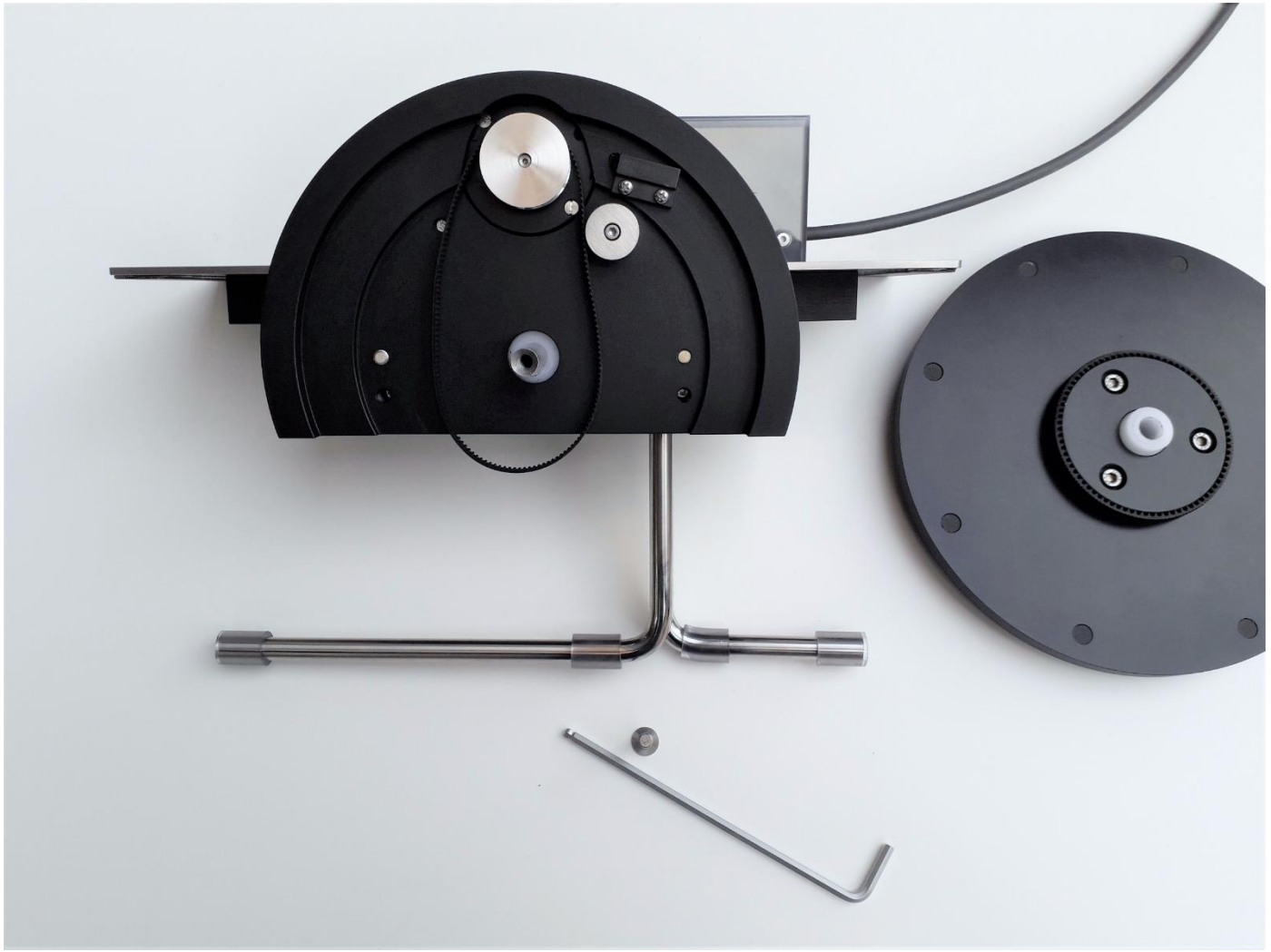
6 Troubleshooting

Reset procedure of the tachometer.

Insert the tools as shown, to operate the adjustment keys.
Press both buttons simultaneously for some seconds to start.
The four digit tacho factor is shown. The right digit flashes
Set it with the right pushbutton ,use the left one to confirm
and repeat the procedure for all digits.

Set **2086**
3x confirmation

7 Adaption to other waterbaths



7 Adaption to other waterbaths

The base plate can be removed by loosening the two screws on the underside of the housing.

It can easily be replaced or adjusted as needed.. As well as the brackets.

Please note: The drive wheel must be immersed in the water bath up to its central axis..

8 Technical Data

Drive
24 V stepper motor
Toothed belt drive
Bearings made of PTFE Teflon (Vink)
Axis Inox Steel / Quality 1.4305
Speed pulses with 8 magnets and reed switch
Housing made of PVC-CAW (Simona) for laboratory equipment suitable for certification marks

Controller
Microprocessor-controlled speed control 6 .... 40 rpm +/- 0.1 rpm soft start
Speedometer display 3 digits
Housing made of PVC-CAW (Simona) for laboratory equipment suitable for certification marks
Speedometer cover made of polycarbonate (Bayer Makrolon)

Loop cradle
Maximum ring diameter 200 mm
Capacity for up to 24 rings made of standard tubing with 3/8 “inner diameter
Stainless steel 1.4430

Circular tube cutter
For the precise cutting of soft PVC tubes up to a diameter of 16 mm

Tube connector
autoclavable polycarbonate (Bayer Makrolon)
temperature resistant up to 120 ° C
Screws made from stainless steel 1.4305

9 **Service**

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The device conforms with the current standards and directives of the EU.
A certificate is enclosed.