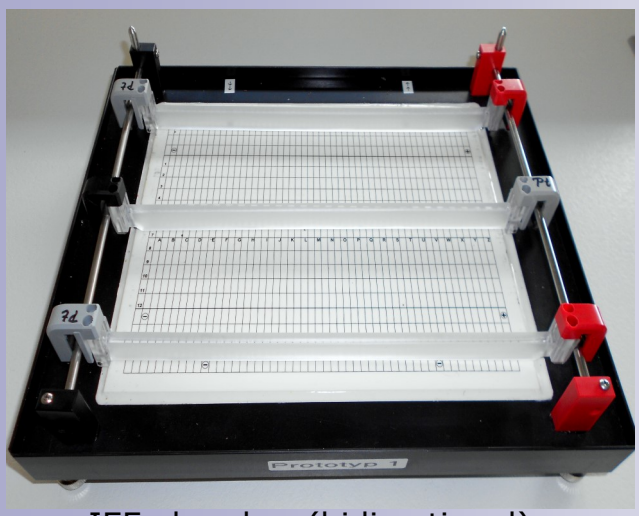
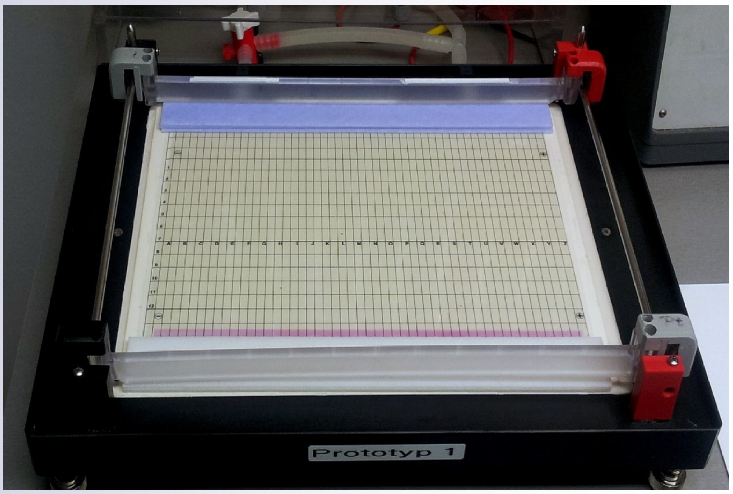
flatbed professional

v9-07/16

Manual



IEF-chamber (bidirectional)...



...and as electrophoresis chamber

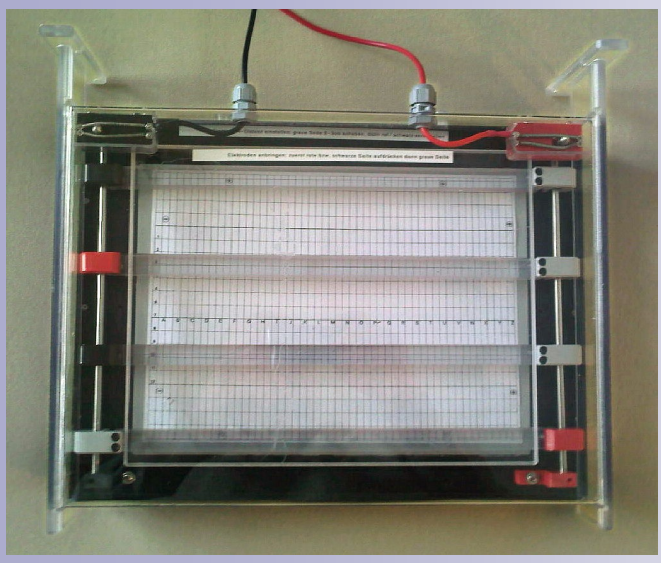
flatbed professional

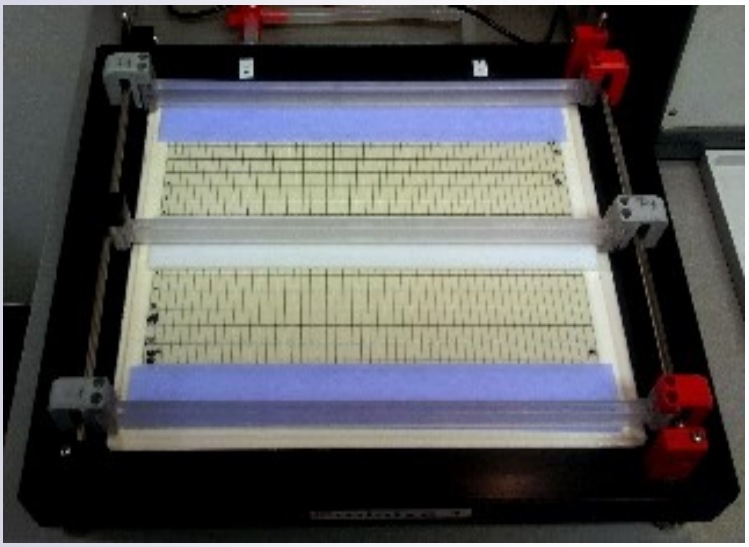
flatbed professional (edc-ief-2836)
Scope of Delivery
1 basic unit including cooling plate
1 safety lid with 2 movable platinum electrodes
1 heavy glasplate (250 x 276 x 8 mm) as weight for the electrodes
connecting cables for power supplies (4 mm plug)
(2 mm —> 2 mm and 2 mm —> 4 mm connectors)
2 x 2 m cooling tube complete incl. 1 * 3-way valve + 1 T-connector
1 manual

Additionally available
Electrodes:
Anode (edc-ief-2841)
Cathode (edc-ief-2842)

Content

1. Introduction Page 2
2. General Information Page 3
3. Basic Unit Page 4
4. The Electrodes Page 4
5. The Safety Lid Page 5
6. Technical Data Page 5
7. Scope of Delevery Page 5
8. Installation of the Appliance Page 6
9. Working with the Electrophoresis Chamber —> IEF Page 7
10. Working with the Electrophoresis Chamber —> Elpho Page 8
11. Connecting the Chamber to a Kryostat Page 10
12. Warranty Page 10





1. Introduction

Before bringing the appliance into service please read this manual carefully. You will obtain important hints concerning safety and accurate use of the appliance.

User's Commitment

Persons working with the appliance are committed to read these instructions and to get themselves informed about the valid measures of accident prevention. Correctness of functioning of the appliance must be checked in regular intervals by the user.

Safety Requirements

This appliance is run with high voltage up to 6.000 Volts e.g. when isoelectric focussing is performed. The electrophoresis chamber may be run on even and stable lab benches only which have to be free of vibration. Only power supply is allowed to be used the voltage sockets of which are separated galvanicly fom the 230V/50Hz mains. Thus only there is not any electric potential between the plus pole and the earth and between the minus pole and the earth. The electric potential now occurs between plus pole and minus pole only.

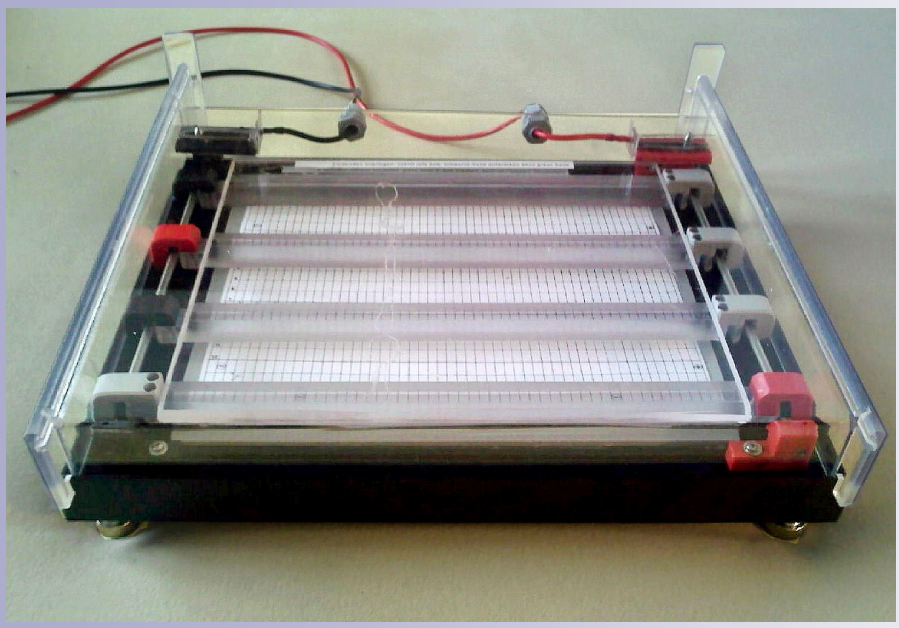
Please note the user's manual of your power pack.

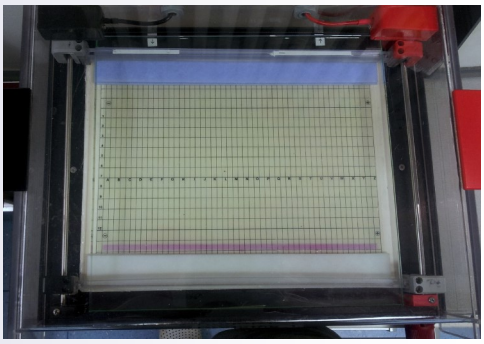
While high voltage is connected to the appliance no one is permitted to come into contact inside the electrophoresis chamber. Before touching the

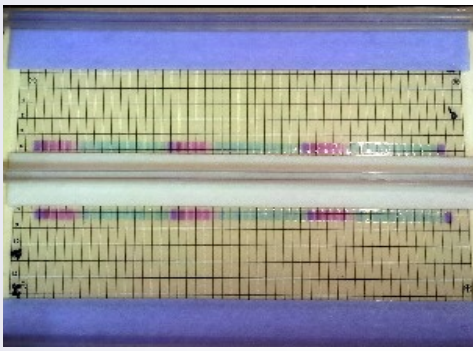
electrophoresis chamber check that the appliance is separated from power supply. To do this the power supply is switched off and the leads for the plus pole and the minus pole are separated from power supply.
The appliance and the power supply cables should be inspected for damage regularly.
The appliance is permitted to be used solely to the purpose described herein.

2. General Information

The „flatbed professional" electrophoresis chamber is designed for horizontal isoelectric focusing (IEF) using polyacrylamide- and agarose flat-







bed gels. For better operation during entire electrophoresis and subsequent visualization procedure these gels should be supported by backing films.
The chamber offers best possible protection against electric tension up to 6.000 volt DC. Best operation is obtained when using our instructions concerning the different methods of electrophoresis. The methods can be downloaded from our website or you may wish to order directly: http://www.electrophoresis-development-consulting.de, rubric "Applications".
Initial attempts on horizontal electrophoresis should be executed by using ready-made gels and buffers.

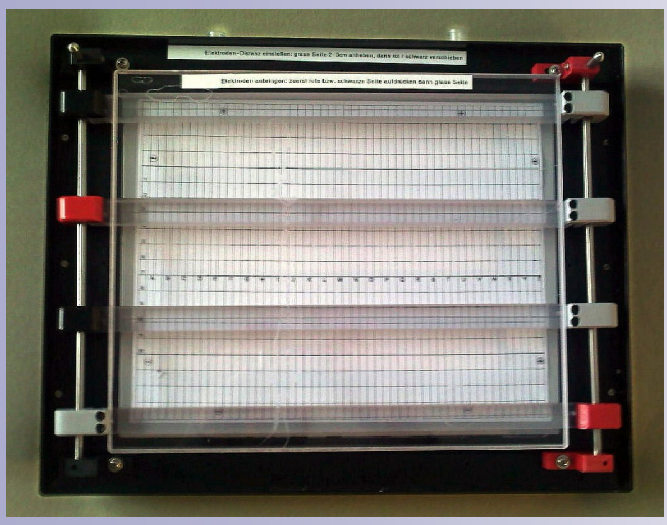
3. The Basic Unit

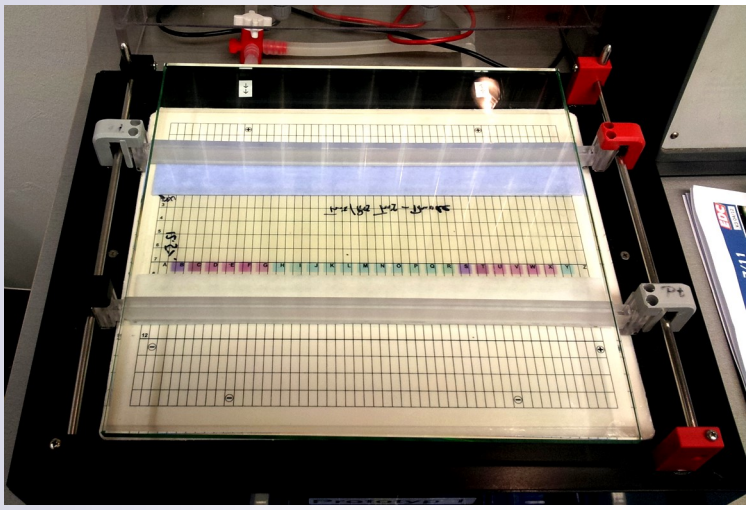
The cooling plate is built straight into the basic unit. The surface is made of pure aluminiumoxide ceramics which guarantees best possible and even cooling of put on gels. The material excellently removes the heat produced in the gels under watt-strong running conditions. The thickness of 4 mm

guarantees good balance of temperature between adjacent zones.
The cooling plate measures are 260 mm x 210 mm which allows to work with all common sizes of finished gels

4. The Electrodes

The electrodes delivered along with this system are made of platinum. They are freely movable and easily adjustable to any position of the gel on the cooling plate.
They are plugged on their electrode bars on both sides:
Plug the anodes with their red heads on the right anodal bar.
Plug the cathodes with their black heads on the left cathodal bar.



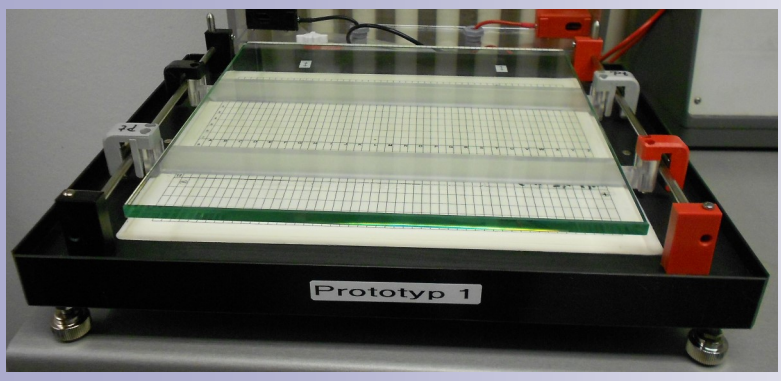


Electrodes are individually pluggable

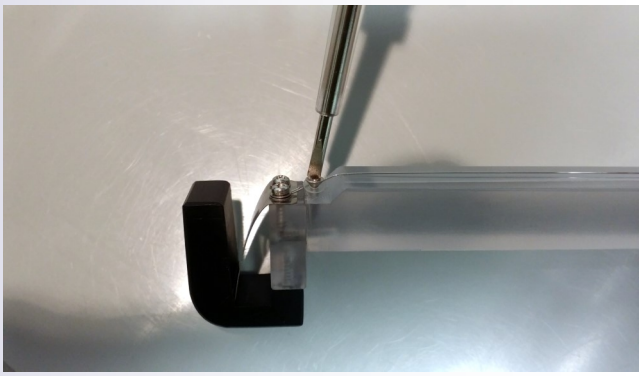
For generating the weight for the contact between platinum wire and gel-surface the heavy weight 8 mm thick glas-plate (delivered along with the chamber) has to be set on the electrodes before high voltage is applied.
Retension of the platinum wires: pull them tight again by slowly turning in the two cross-head screws beside the 45° millings.

5. The Safety Lid

The new design of the safety lid made of hard PVC offers active protection against disruptive discharge. Without the lid being shut correctly, high voltage can not reach the cooling plate inside the chamber and therewith the electrode stripes or the gel. Because of this special construction it is not possible to fit the lid into incorrect position nor to confuse the electric poles of the chamber. Insulation between the parts leading high voltage and liable to be touched is dimensioned generously which is necessary for safe work at



The heavy weight glasplate on the electrodes



Retension of the platinum wires

high voltage up to 6.000 V.

6. Technical Data

name of appliance:
EDC „flatbed professional"
electrophoresis chamber
order number: edc-prof-2836

designed and developed: EDC UG (haftungsbeschränkt), Tuebingen
maximum voltage: 6000 Volt DC
working temparature: +5°C bis +40°C
material of basic unit: PVC
material of of the lid: PVC
material of the electrodes: Platinum
max.Distance: 1-27 cm
material and dimensions of cooling plate:
Aluminiumoxide ceramics, 215 x 264 mm
heigth: 100 mm
depth: 290 mm
width: 345 mm

7. Scope of Delivery

One chamber consists of 1 basic unit including cooling plate, 2 platinum electrodes, 1 safety lid, 1 heavy weight glasplate and 2 pairs of connecting cables for power supply (2 mm connectors and 4 mm connectors), 3 m cooling tubing complete with 1 * 3-way valve, 1 T-connector, 1 manual.

8. Installation of the Appliance

A) Position the electrophoresis chamber on an even lab bench only and close to the power supplier. Use exclusively the cables enclosed for the safety lid.
B) Connect the two cooling connectors with a kryostat using two silicone hoses. Note that inlet and outlet are not to be confused. The cross-section of the inlet is narrowed. If necessary check the kryostat for position of inlet and outlet. Do not use tap water. The water pressure will destroy the cooling plate.
C) Connect the lid with the turned-off power pack. Do not turn on the power pack yet.
D) Place the gel onto the cooling plate with some ml of kerosene.
E) Chose the electrodes' positions. Plug in the electrodes orientated in

The safety lid

the right way. Normally the electrodes must be moved to the utmost end of the IEF-gels.

F) Place the heavy weight glasplate onto the electrodes.

G) Lowering the lid
Lower the safety lid onto the basic unit. It has to sit directly on the basic unit‘s PVC-surface. Now the electric contacts are closed and the power pack can be connected to the „flatbed professional“ chamber. Start IEF now!

H) Opening the safety lid
Switch off the power pack or at least turn to “Pause” position. Not any voltage whatsoever must be applied to the safety lid when it is opened! Lift the lid and set it on the lid‘s feet. The lid is now separated electrically from the power pack.

I) Remove the heavy weight glasplate from the electrodes and de-plug them from their electrical bars.

J) Clean all parts thoroughly

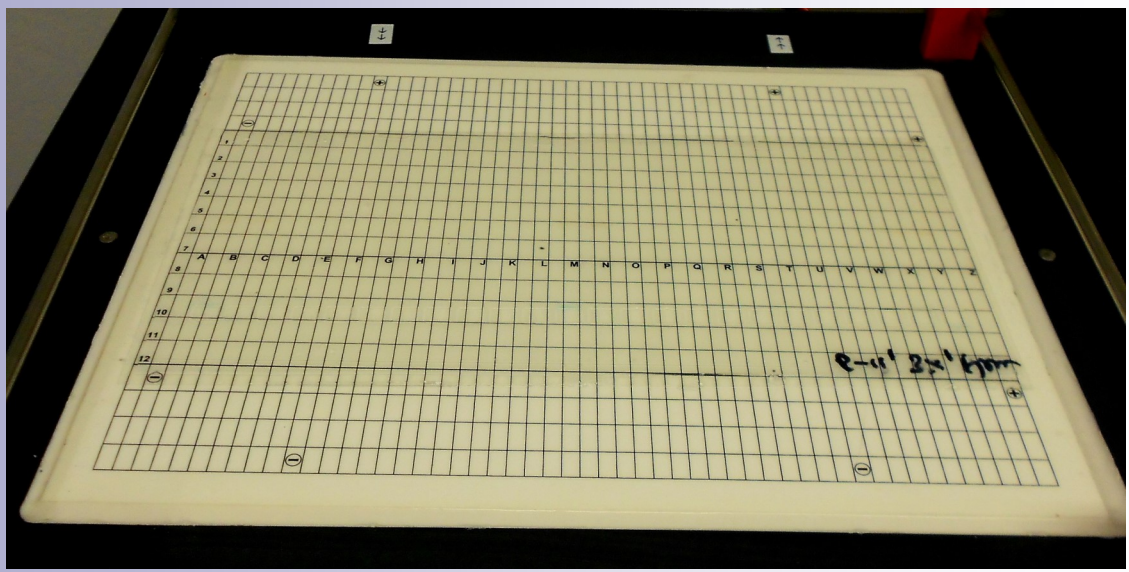
9. Working with the Electrophoresis Chamber

Isoelectric Focusing (IEF) - normal procedure

Make sure that the power supply is switched off. Apply 2,5 ml of kerosene to the cooling plate. Put the IEF gel onto the kerosene, support film downward. Avoid air bubbles. Wipe away exceed volume of kerosene. Line up the gel symmetrically in both directions on the cooling plate.
Apply the samples to small pieces of cotton tissue or use a „Sample Application Strip“ (GE). If gels with slots are used, pipet the appropriate volume directly to these slots.
Plug in the electrodes orientated correctly to their electrical bars at the desired positions. Pipett the samples.
Lay the heavy weight glasplate on the electrodes.
After that lower the lid completely onto the basic unit.
Set the valid running conditions in the power supply and switch on.

Bi-directional and multi-directional IEF-procedures

The flatbed professional chamber is designed to apply bi-directional and

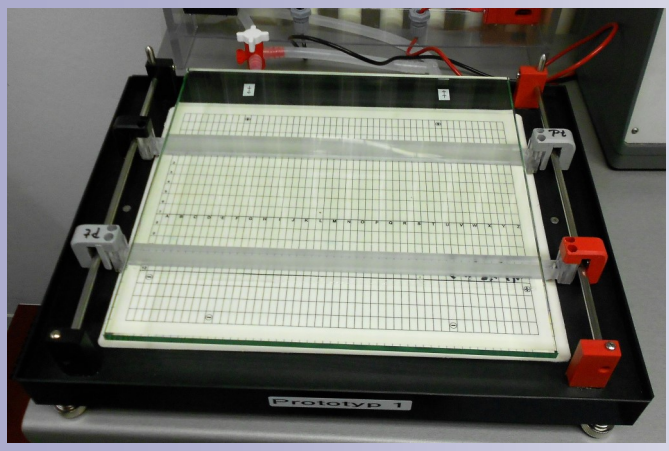


gel on the cooling plate

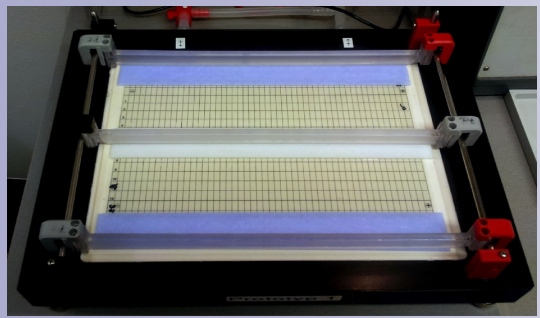
even multidirectional IEF.
Connect up to 6 electrodes (up to 5 IEF-segments),.
The sequence „anode-cathode-anode a.s.o have to be followed to have voltage between the electrodes.
Every segment uses its own current, so the mA and the Watt-values have to be adjusted to the number of IEF-segments.
The voltage is relative to the distance of the platinum-wires, so also this value should be calculated correctly.

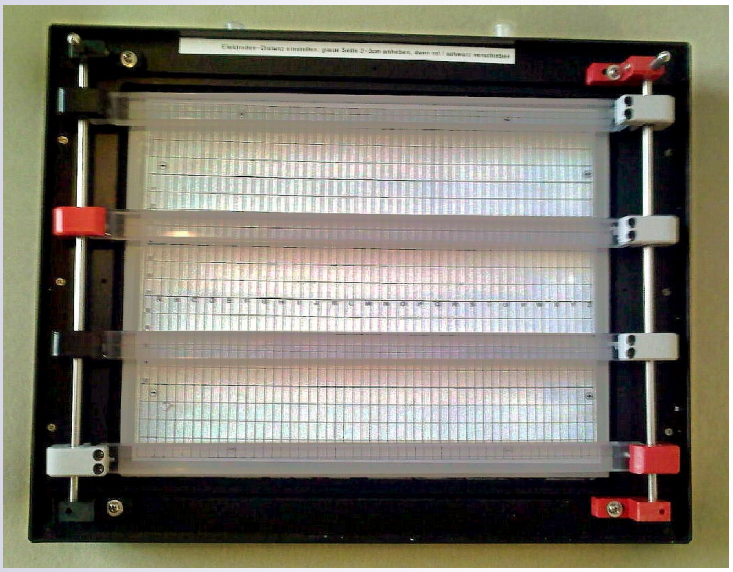
11. Connecting the Chamber to a Kryostat

For tempering of the cooling plate the chamber must get connected to a customary kryostat.
Caution: Connecting „flatbed basic" to a tap water pipe will destroy the cooling plate. The water pressure of tap water pipes is too high!
Connect the kryostat via the three way valve (delivered along) so that the kryostat can pump the tempering fluid (distilled water is best) both past the cooling plate (bypass operation) and through the cooling plate (normal operation). Pay attention to the pumping direction of the tempering fluid. The inlet opening is on the left hand side, the outlet opening on the right hand side. Select bypass tempering operation position (see Ill.1) when at the beginning of electrophoresis the kryostat is switched on and must cool itself down. At putting on of samples, that is while the chamber is open, the put on gel should not be cooled since this would lead to water condensation on the surface of the gel. After termination of putting on of samples and after putting on the electrode lid turn the valve position to "Normal" (Ill. 1 and 2). Caution, often not considered: The electrophoresis sail is not tempered then and gets heated up by the applying watts. If a number of chambers are connected to a kryostat the chambers currently not used should be turned to "Bypass".



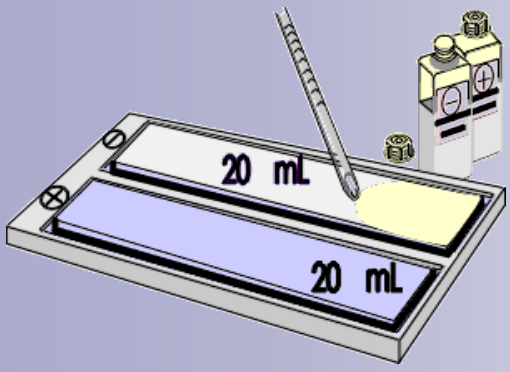
Normal IEF-procedure= 2 electrodes


Bi-directional SDS: central cathode - peripheral anodes

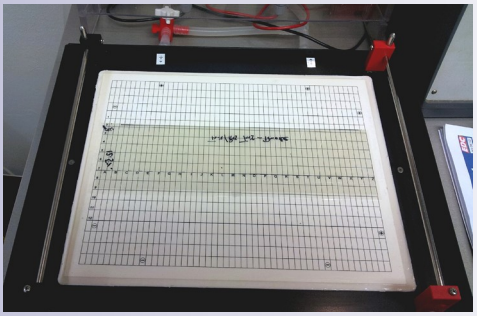

Multi-directional IEF:
4 electrodes = 3 IEF-segments

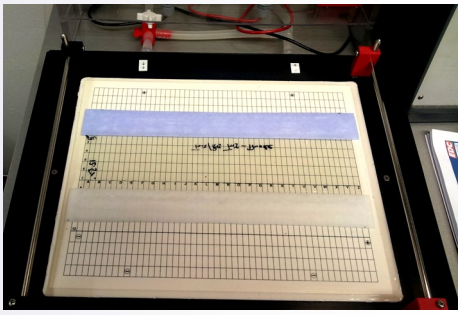
10. Working with the Electrophoresis Chamber
Electrophoresis, normal procedure

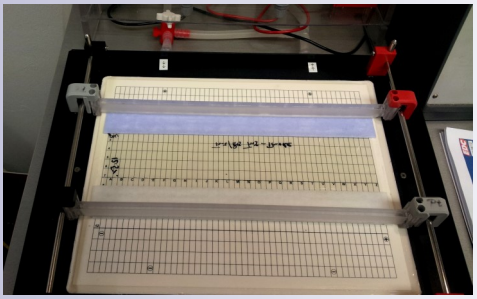
Make sure that the power supply is switched off. Apply 2,5 ml of kerosene to the cooling plate. Put the electrophoresis gel onto the kerosene, support film downward. Avoid air bubbles. Wipe away exceed volume of kerosene. Line up the gel symmetrically in both directions on the cooling plate.
Lay two electrode wicks into the compartments of the Rehydration Pool . Apply 20 ml of the respective electrode buffer to each wick using a pipette, or less, if cut.
Place the cathode strip onto the cathodal edge of the gel. The edge of the strip should overlap 2-3 mm on the gel's surface.
Place the anode strip over the anodal edge.
Plug in the electrodes orientated correctly to their electrical bars at the desired positions. Pipet the samples.
Lay the heavy weight glasplate on the electrodes.
Set the valid running conditions in the power supply and switch on.

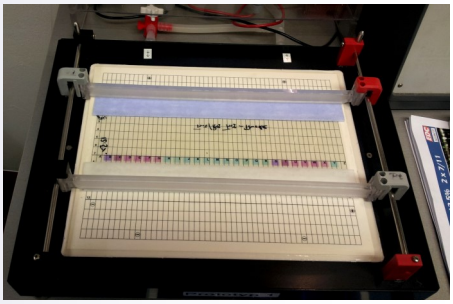


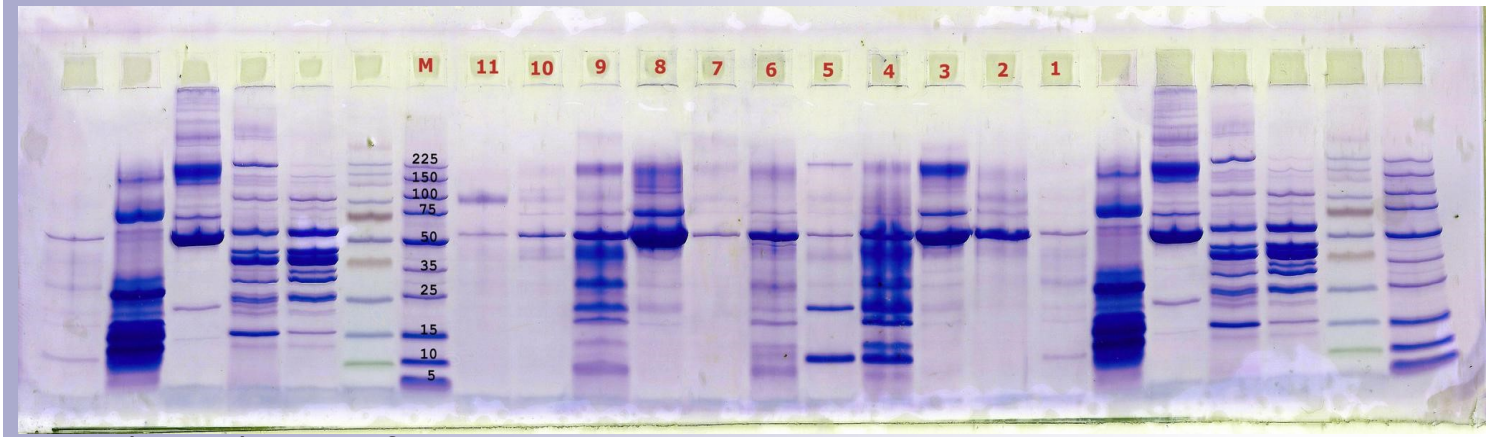
Soaking the electrode wicks with the electrode solution in the Rehydration Pool


Application of the gel….


….and the buffer-wicks.


The electrodes sit on the outer edges of the wicks

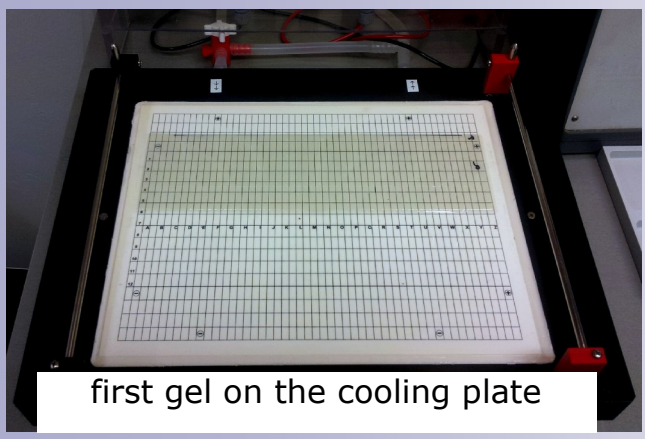

Samples were pipetted.



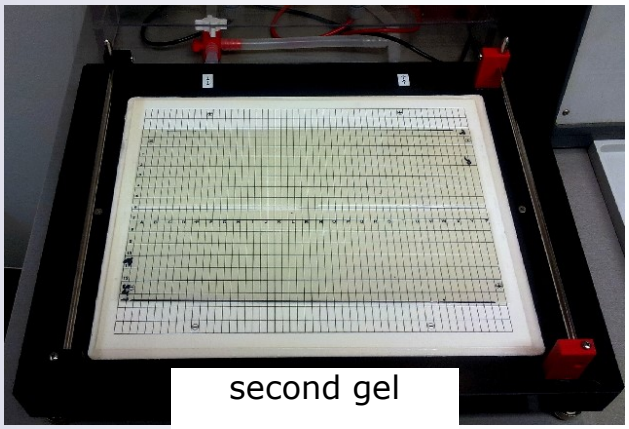
SDS-electrophoresis of Urinary Proteins

Bi-directional electrophoresis procedure

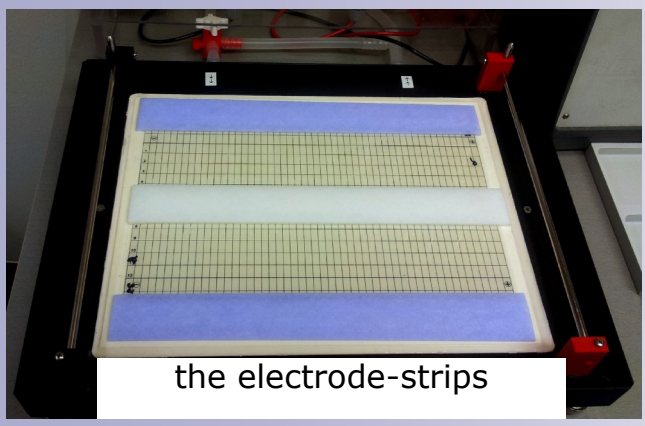
The flatbed professional chamber is designed to apply bi-directional electrophoresis runs. Connect 3 electrodes (2 electrophoresis segments).
The cathode is normally the central electrode.
Every segment uses its own current, so the mA and the Watt-values have to be doubled.
The voltage is relative to the distance from the negative to the positive platinum-wires, so also this value should be calculated correctly!.



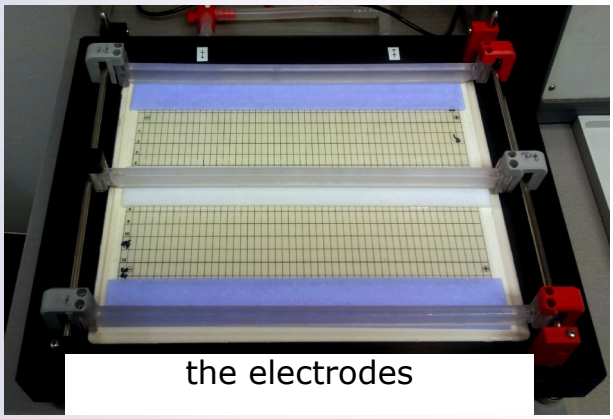
first gel on the cooling plate



second gel



the electrode-strips



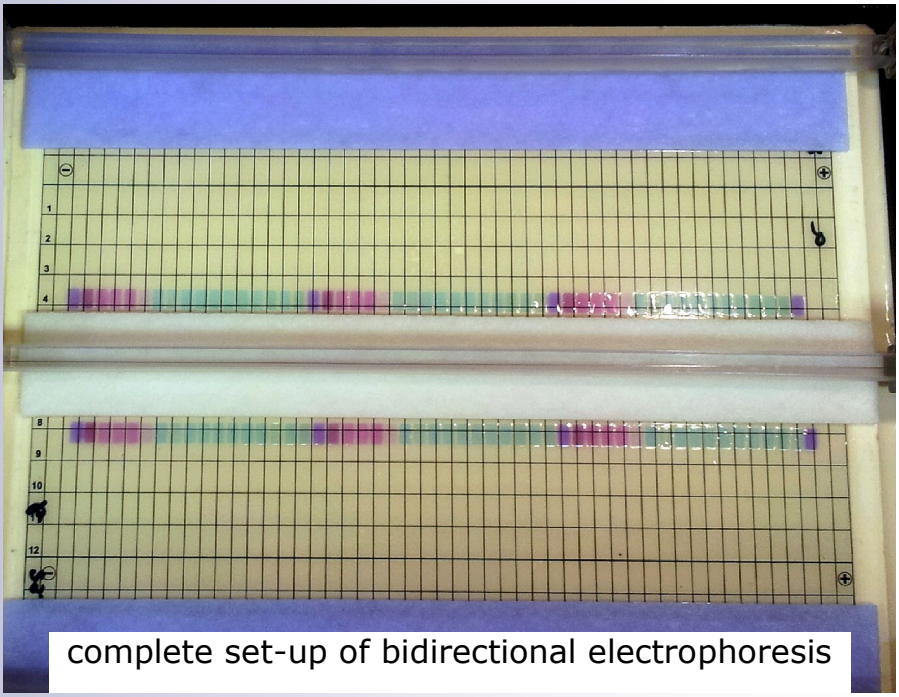
the electrodes

2 gels were positioned on the cooling plate with the cathodes together.

Then the 3 electrode-wicks were applied.
The electrodes switch on their bars and on the wicks.
Lay ~0.5 mm strips on the 2 peripheral electrodes otherwise the glasplate will not sit properly (if the central electrode sits on the gel).

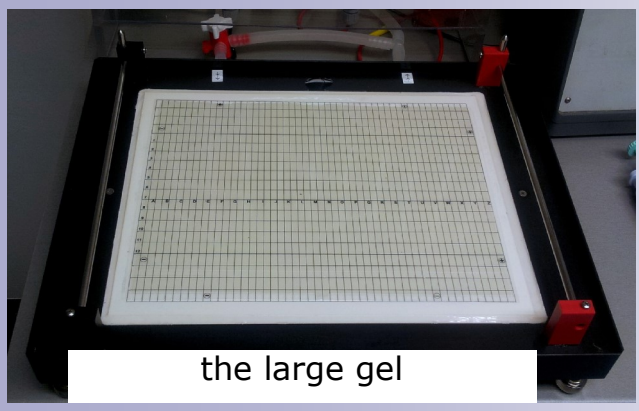
Samples were pipetted

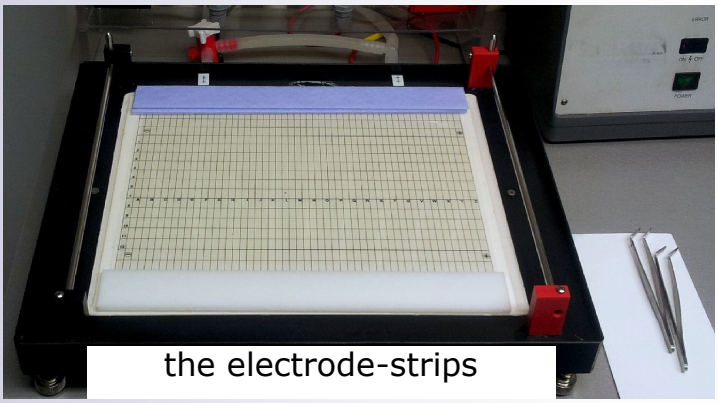
The heavy-weight glasplate is set on the electrodes.

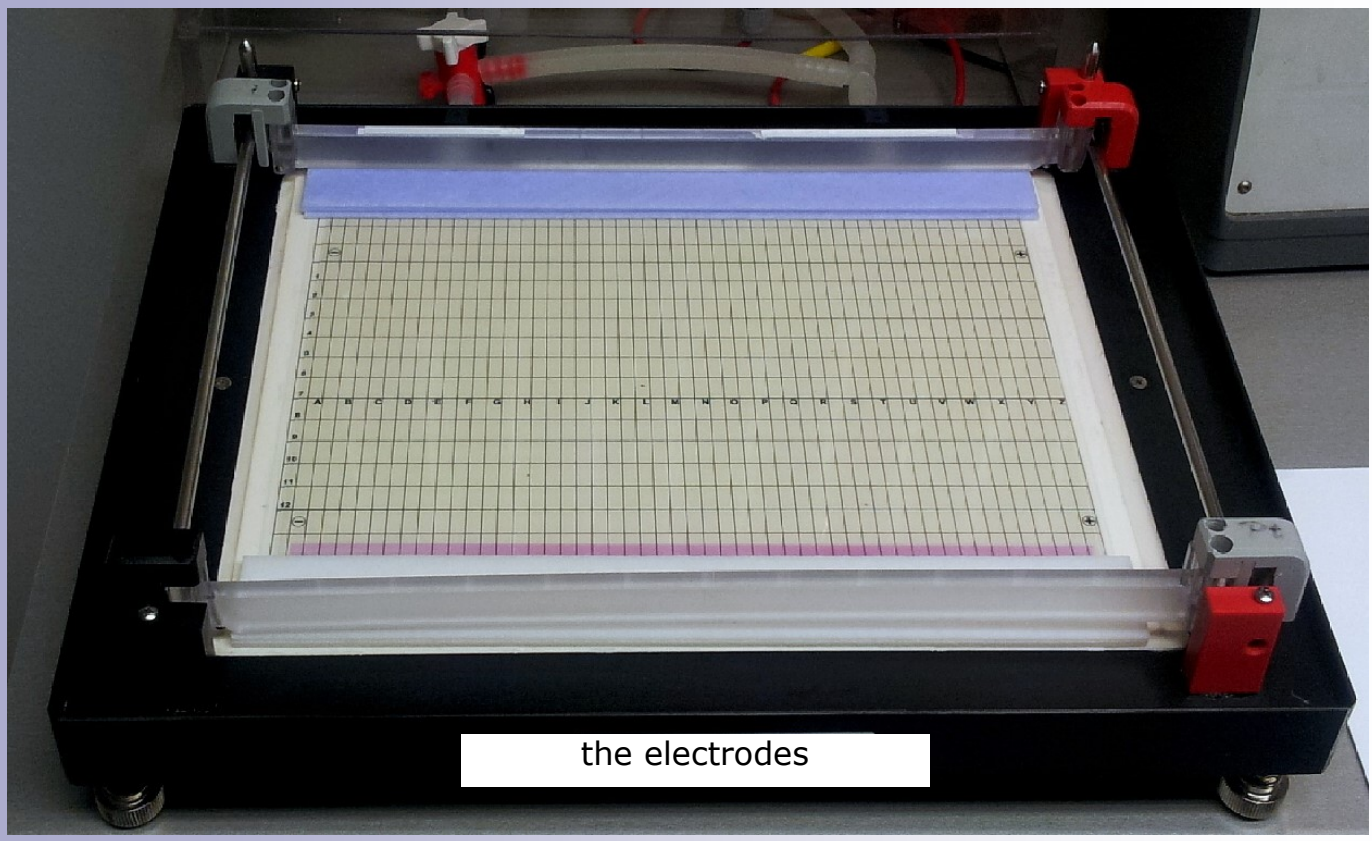


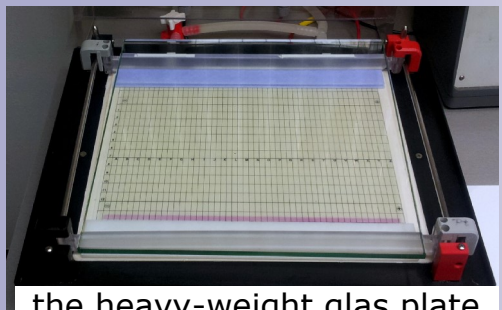
complete set-up of bidirectional electrophoresis

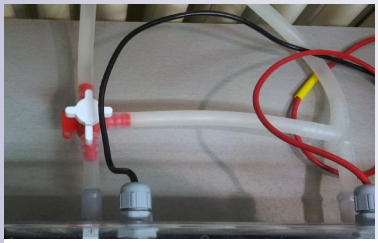
Electrophoresis procedure with large gels (for proteomics)
The flatbed professional chamber is also designed to apply large size electrophpresis gels up to 26 x 19 cm + electrodes.
Maximal electrode distance is 29 cm.

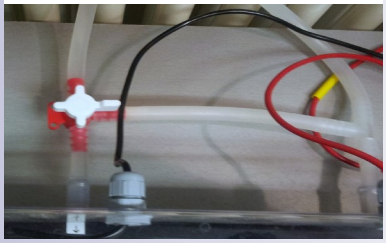

the large gel

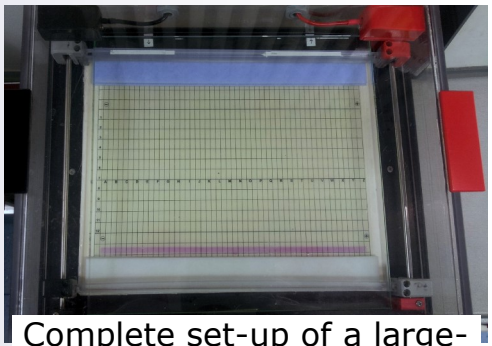

the electrode-strips


the electrodes

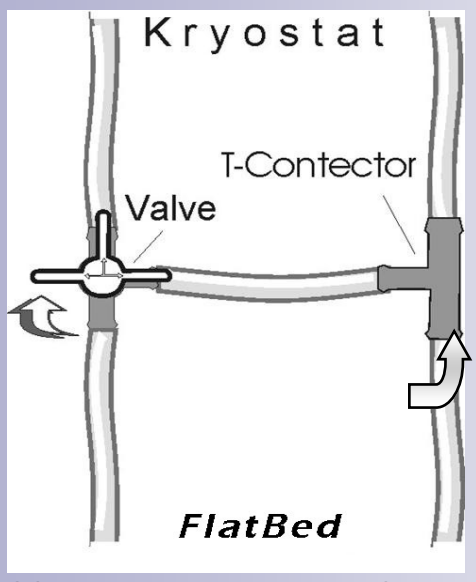

the heavy-weight glas plate

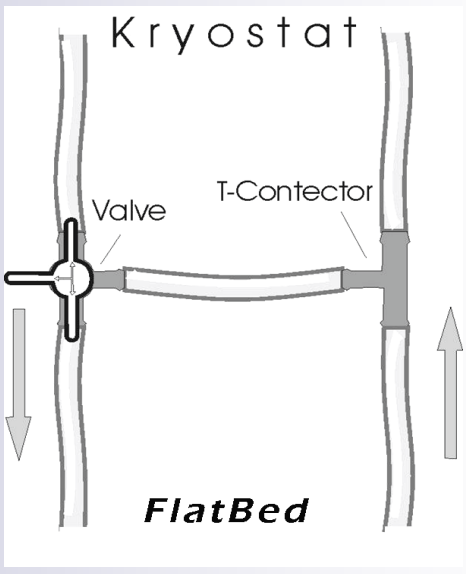

„Bypass" to „Cooling"




Complete set-up of a large-sized electrophoresis

1.) Positi-on **„Bypass"**





2.) Position on **„Normal"**

11. Warranty

In the case of adequate treatment a guarantee period of 24 months applies to this equipment.