Biometra

PRODUCT LINE

Eco-Line

Vertical Polyacrylamide Gel Electrophoresis
&
Tank Blotting Apparatus

Instruction Manual

Model

Eco-Mini E / System E	**017-101 / 017-100**
Eco-Mini EB / System EB	**017-103 / 017-102**
Eco-Mini EBC / System EBC	**017-105 / 017-104**
Eco-Maxi EB / System EB	**017-400 / 017-401**
Eco-Maxi EBC / System EBC	**017-402 / 017-403**
Tankblot Eco-Mini C	**018-100**
Tankblot Eco-Mini	**018-101**
Tankblot Eco-Maxi C	**018-400**
Tankblot Eco-Maxi	**018-401**

analytikjena

Please read these instructions carefully before using this apparatus!

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This document describes the state at the time of publishing. It needs not necessarily agree with future versions.

Subject to change!

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1 Introduction

1.1 Field of Application

The Biometra **Eco-Line** is a modular, tank-style apparatus designed for the separation of proteins and nucleic acids (DNA/RNA) in vertical polyacrylamide (PAGE) gels.
Interchangeable electrode modules allow electrophoresis and blotting using the same buffer tanks. Using the Electrophoresis Module (Gel Module) the Eco-Line runs up to 4 gels (Eco-Mini) or up to two gels (Eco-Maxi). The module accepts hand cast gels as well as pre-cast gels (Eco-Mini only). Using the Blot Module the apparatus allows blotting of one to two gels (Eco-Maxi) or one to four gels (Eco-Mini) simultaneously in individual cassettes.

	Suitability			Components included in the system	
	Electrophoresis	Blotting	Cooling	Buffer tank	furthermore
Eco-Mini system E (017-100)	✓			E	**Buffer tank (see left), bigfoot lid, Electrophoresis Module, 2 sets of glass plates with fixed 1 mm spacers, 1 dummy plate, 2 combs (10 wells), casting stand and manual**
Eco-Mini system EB (017-102)	✓	✓[1]		EB	
Eco-Mini system EBC (017-104)	✓	✓[1]	✓	EBC	
Tankblot Eco-Mini C (018-100)	✓[2]	✓	✓	EBC	**Buffer tank (see left), bigfoot lid, Blot Module, 4 blotting cassettes (colour-coded), 8 fiber pads and manual**
Tankblot Eco-Mini (018-101)	✓[2]	✓		EB	

[1] with addition of components required for blotting (see "furthermore" for Tankblot Eco-Mini systems)
[2] with addition of components required for electrophoresis (see "furthermore" for Eco-Mini systems)

Eco-Mini & Tanblot Eco-Mini: System Overview

		Components included												
Item	Order No.	Buffer chamber E	Buffer chamber EB	Buffer chamber EBC with cooling option	Bigfoot Safety Lid	Electrophoresis Module	2 x glass plates with fixed spacers, 1.0 mm	2 x notched glass plates	Dummy Plate	2 x comb, 1.0 mm, 10 wells	Casting Stand	Blot Module	4 x blotting cassettes	8 x foam pads
Eco-Mini System E	017-100	+			+	+	+	+	+	+	+			
Eco-Mini E	017-101	+			+	+	+	+	+	+				
Eco-Mini System EB	017-102		+		+	+	+	+	+	+	+			
Eco-Mini EB	017-103		+		+	+	+	+	+	+				
Eco-Mini System EBC	017-104			+	+	+	+	+	+	+	+			
Eco-Mini EBC	017-105			+	+	+	+	+	+	+				
Electrophoresis Module Eco-Mini	017-175					+								
Tankblot Eco-Mini C	018-100			+	+							+	+	+
Tankblot Eco-Mini	018-101		+		+							+	+	+
Blot Module Eco-Mini	018-105											+	+	+

	Suitability			Components included in the system	
	Electrophoresis	Blotting	Cooling	Buffer tank	furthermore
Eco-Maxi system EB (017-400)	✓	✓[1]		EB	Buffer tank (see left), bigfoot lid, Electrophoresis Module, 2 sets of glass plates with fixed 1 mm spacers, 2 combs (12 wells), casting stand and manual
Eco-Maxi system EBC (017-402)	✓	✓[1]	✓	EBC	
Tankblot Eco-Maxi C (018-400)	✓[2]	✓	✓	EBC	Buffer tank (see left), bigfoot lid, Blot Module, 2 blotting cassettes (colour-coded), 4 fiber pads and manual
Tankblot Eco-Maxi (018-401)	✓[2]	✓		EB	

[1] with addition of components required for blotting (see "furthermore" for Tankblot Eco-Maxi systems)
[2] with addition of components required for electrophoresis (see "furthermore" for Eco-Maxi systems)

Eco-Maxi & Tanblot Eco-Maxi: System Overview

		Components included										
Item	Order No.	Buffer chamber EB	Buffer chamber EBC with cooling option	Bigfoot Safety Lid	Electrophoresis Module	2 x glass plates with fixed spacers, 1.0 mm	2 x notched glass plates	2 x comb, 1.0 mm, 10 wells	Casting Stand	Blot Module	4 x blotting cassettes	8 x foam pads
Eco-Maxi System EB	017-400	+		+	+	+	+	+	+			
Eco-Maxi EB	017-401	+		+	+	+	+	+				
Eco-Maxi System EBC	017-402		+	+	+	+	+	+	+			
Eco-Maxi EBC	017-403		+	+	+	+	+	+				
Electrophoresis Module Eco-Maxi	017-475				+							
Tankblot Eco-Maxi C	018-400		+							+	+	+
Tankblot Eco-Maxi	018-401	+								+	+	+
Blot Module Eco-Maxi	018-405									+	+	+

The Biometra **Eco- Line** is designed for laboratory research only.

1.2 Specifications

Construction

Buffer Tank	PMMA
Bigfoot safety lid	PMMA
Blotting Module	PMMA
Blot cassette	PMMA
Electrophoresis (Gel) Module	POM
Casting Stand	PE
Combs	Teflon

Eco-Mini combs:

Thickness (mm)	Number of Wells	Volume per Well (µl)
0.75	1 prep. 9 MTP[(c)] 10 12 15	2 x 25 and 385 30 33 25 18
1.0	1 prep. 9 MTP[(c)] 10 12 15	2 x 35 and 515 43 45 35 25
1.5	1 prep. 9 MTP[(c)] 10 12 15	2 x 55 and 780 65 70 55 37

[(c)] Microtiter plate compatible / multichannel pipet compatible

Eco-Maxi combs:

Thickness (mm)	Number of Wells	Volume per Well (µl)
0.75	1 prep. 12 19 MTP[(c)] 25 30	2 x 30 and 970 70 32 30 20
1.0	1 prep. 12 19 MTP[(c)] 25 30	2 x 45 and 1,310 95 45 40 29
1.5	1 prep. 12 19 MTP[(c)] 25 30	2 x 75 and 2,340 165 75 70 52

[(c)] Microtiter plate compatible / multichannel pipet compatible

Buffer volume	Eco-Mini	approx. 1,580 ml for electrophoresis (buffer tank E) approx. 2,180 ml for electrophoresis (buffer tank EB and EBC) Approx. 2,100 ml for blotting (buffer tank EB and EBC)
	Eco-Maxi	approx: 5,400 ml for electrophoresis (buffer tank EB and EBC) approx. 6,100 ml for blotting (buffer tank EB and EBC)
Cooling option		Buffer tank EBC: flow through
Overall size (W x D x H)	Eco-Mini	21.0 x 15.0 x 22.0 cm (buffer tank E) 21.0 x 15.0 x 25.0 cm (buffer tank EB) 21.0 x 15.0 x 26.5 cm (buffer tank EBC)
	Eco-Maxi	32.5 x 15.0 x 38.5 cm (buffer tank EB) 32.5 x 15.0 x 40.0 cm (buffer tank EBC)
Gel size (W x L)	Eco-Mini	9.4 x 8.0 cm
	Eco-Maxi	19.4 x 18.5 cm
Blotting area (W x L)	Eco-Mini	9.4 x 8.0 cm
	Eco-Maxi	22.0 x 19.0 cm
Gel compatibility	Eco-Mini	hand cast and pre-cast gels
	Eco-Maxi	hand cast gels
Weight	Eco-Mini	max. 2.5 kg (depending on system)
	Eco-Maxi	max. 8 kg (depending on system)
Chemical compatibility		The components are not compatible with alcohol >10% (e.g. ethanol) or organic solvents (e.g. acetone, chloroform, toluene, benzene). Use of organic solvents voids all warranties.

The instrument is designed for operation in closed laboratory rooms at ambient temperature from +5 °C to +40 °C and maximum relative humidity 80% for temperatures up to +31 °C decreasing linearly to 50% relative humidity at +40 °C.

1.3 Legal Notes

Copyright

Liability

Biometra is not liable for damages and injuries caused by use not considering these operation instructions in parts or completely.

1.4 Meaning of the Instructions

Biometra recommends that you first read these instructions carefully. Then assemble and disassemble the apparatus to become familiar with the system. After these preliminary steps, you should be ready to transfer a sample.

This operation instruction is part of the product and should be kept over the full life-time of the instrument. It should also be forwarded to subsequent owners and users. Make sure that additions and updates are inserted into the operation instructions.

2 Safety and Warning Notices

2.1 Definition of Symbols

Symbol	Definition
	Caution! Refer to instruction manual!
	Danger! High voltage!
	Fragile!
	Using with direct current (DC).

2.2 General Safety Instructions

Delicate instruments! Handle with care!

Do not operate this equipment if buffer or water leaks from the instrument, if cracks are present in the body or the safety cover or if the electrical connection cables are worn or frayed.

Never place the instrument on top of a Power Supply.

Make sure that the on/off switch of the used external Power Supply is always free accessible.

Use only Biometra safety power cords for connecting the electrophoresis equipment to the Power Supply.

Danger! High voltage!
The current to the cell, provided from the external Power Supply, enters the unit through the lid assembly, providing a safety interlock to the user. Current to the cell is broken when the lid is removed.

Do not attempt to circumvent this safety interlock, and always turn Power Supply off before removing the lid, or when working with the cell in any way.

Power to the instrument is supplied by an external DC voltage Power pply. The output of this Power Supply must be isolated from external und to issue that the DC voltage output floats with respect to ground. (All Biometra Power Supplies meet this safety requirement!)

Using the cooling option do not mix up the "in" and "out" plugs for the cooling water.

Best cooling is obtained using a refrigerated circulator (chiller) with a temperature of 5°C.
(**Attention:** Reduce flow rate to max. 0.5 - 1 l/min and use **no** organic solvents or alcohol !)

Do not use alcohol (e.g. methanol, ethanol) or organic solvents for cooling or cleaning the apparatus.

Fill the buffer tank with buffer up to the “--- max. fill line ---”. Use of lower buffer volume can generate higher buffer temperature and might damage the instrument.

This products are designed and certified to meet EN 61010-1 safety standards.

Certified products are safe to use when operated in accordance with the instruction manual.

This instruments should not be modified or altered in any way.
Alteration of this instruments will void the warranty, void the EN61010-1 certification, and create a potential safety hazard.

Operating Conditions:

	max. V (DC)	max. mA	max. W	max. Temp.
Electrophoresis:				
Eco-Mini:				
Buffer tank E	200	50 (2 or 4 gels)	10	50°C
Buffer tank EB	200	50 (2 or 4 gels)	10	50°C
Buffer tank EBC*	200	50 (2 or 4 gels)	10	50°C
Eco-Maxi:				
Buffer tank EB	400	125 (2 gels)	50	50°C
Buffer tank EBC*	400	250 (2 gels)	100	50°C

Max. power rating for <u>electrophoresis without cooling</u> should not be longer than 18h at 5 W / gel for Eco-Mini and 18 h at 25 W / gel for Eco-Maxi.

Max. power rating for <u>electrophoresis with cooling</u> should not be longer than 18 h at 5 W / gel for Eco-Mini and 18 h at 50 W / gel for Eco-Maxi.

Blotting:				
Eco-Mini:				
Buffer tank EB	100	300	30	50°C
Buffer tank EBC*	100	300	30	50°C
Eco-Maxi:				
Buffer tank EB	60	1,000	60	50°C
Buffer tank EBC*	100	1,000	130	50°C

Transfer time for <u>blotting without cooling</u> should not be longer than 4 h at 30 W for Eco-Mini and 6 h at 60 W for Eco-Maxi.

Transfer time for <u>blotting with cooling</u> should not be longer than 18 h at 30 W for Eco-Mini and 18 h at 130 W for Eco-Maxi.

*** using the cooling option**

3 Setting-Up Operation

3.1 Scope of Delivery

Eco-Line is available in multiple versions for electrophoresis and/or blotting:

Eco-Mini
Complete system with
- buffer tank E, EB or EBC,
- Bigfoot Safety Lid with attached power cords,
- Electrophoresis Module,
- 2 sets of glass plates with fixed **1 mm** spacers,
- 1 Dummy plate,
- 2 combs (10 wells) and
- manual

Eco-Mini System comes additionally with a **Casting Stand** for up to 2 single-gel or double-gel sandwiches.

Tankblot Eco-Mini
Complete modular system with
- buffer tank EB or EBC (with cooling base),
- Bigfoot Safety Lid with attached power cords,
- Blot Module,
- 4 Blotting Cassettes (colour-coded),
- 8 foam pads and
- manual

Eco-Maxi
Complete system with
- buffer tank EB or EBC,
- Bigfoot Safety Lid with attached power cords,
- Electrophoresis Module,
- 2 sets of glass plates with fixed **1 mm** spacers,
- 2 combs (12 wells) and
- manual

Eco-Maxi System comes additionally with a **Casting Stand** for up to 2 gels.

Tankblot Eco-Maxi
Complete modular system with
- buffer tank EB or EBC (with cooling base),
- Bigfoot Safety Lid with attached power cords,
- Blot Module,
- 2 Blotting Cassettes (colour-coded),
- 4 foam pads and
- manual

Eco-Mini & Tankblot Eco-Mini

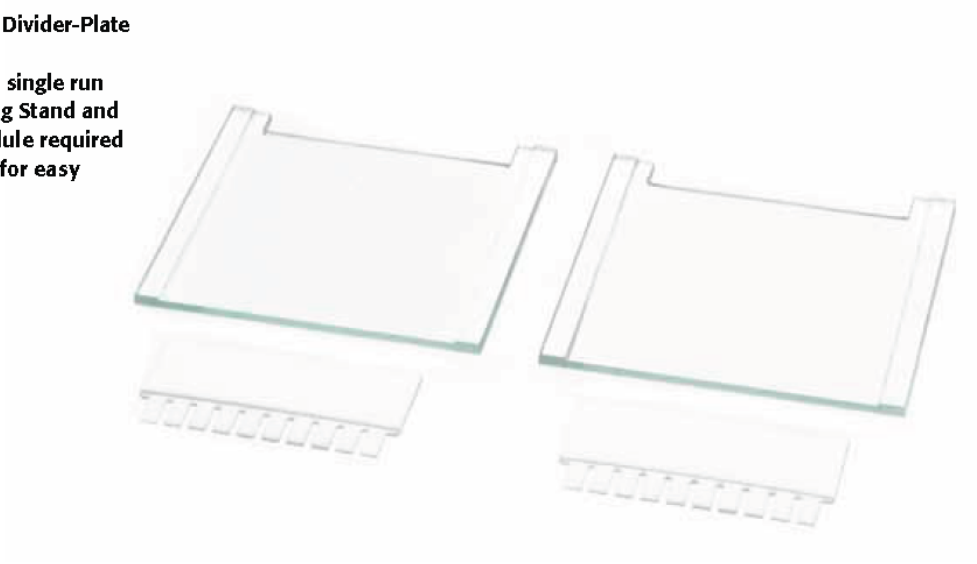
Overview

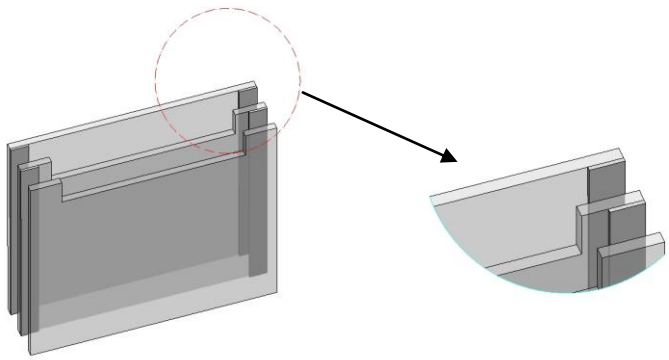
Eco-Mini & Tanblot Eco-Mini: System Overview

		Components included												
Item	**Order No.**	Buffer chamber E	Buffer chamber EB	Buffer chamber EBC with cooling option	Bigfoot Safety Lid	Electrophoresis Module	2 x glass plates with fixed spacers, 1.0 mm	2 x notched glass plates	Dummy Plate	2 x comb, 1.0 mm, 10 wells	Casting Stand	Blot Module	4 x blotting cassettes	8 x foam pads
Eco-Mini System E	017-100	+			+	+	+	+	+	+	+			
Eco-Mini E	017-101	+			+	+	+	+	+	+				
Eco-Mini System EB	017-102		+		+	+	+	+	+	+	+			
Eco-Mini EB	017-103		+		+	+	+	+	+	+				
Eco-Mini System EBC	017-104			+	+	+	+	+	+	+	+			
Eco-Mini EBC	017-105			+	+	+	+	+	+	+				
Electrophoresis Module Eco-Mini	017-175					+								
Tankblot Eco-Mini C	018-100			+	+							+	+	+
Tankblot Eco-Mini	018-101		+		+							+	+	+
Blot Module Eco-Mini	018-105											+	+	+

Divider-Plates for Eco-Mini Electrophoresis

- **Double gel capacity: Divider-Plate Set (ind. 2 combs)**
- **Run up to 4 gels in a single run**
- **No additional Casting Stand and Electrophoresis Module required**
- **Fixed glass spacers for easy handling**





Double-gel sandwich for Eco-Mini

Eco-Maxi & Tankblot Eco-Maxi

Overview

Eco-Maxi & Tanblot Eco-Maxi: System Overview

		Components included										
Item	**Order No.**	Buffer chamber EB	Buffer chamber EBC with cooling option	Bigfoot Safety Lid	Electrophoresis Module	2 x glass plates with fixed spacers, 1.0 mm	2 x notched glass plates	2 x comb, 1.0 mm, 10 wells	Casting Stand	Blot Module	4 x blotting cassettes	8 x foam pads
Eco-Maxi System EB	017-400	+		+	+	+	+	+	+			
Eco-Maxi EB	017-401	+		+	+	+	+	+				
Eco-Maxi System EBC	017-402		+	+	+	+	+	+	+			
Eco-Maxi EBC	017-403		+	+	+	+	+	+				
Electrophoresis Module Eco-Maxi	017-475				+							
Tankblot Eco-Maxi C	018-400		+							+	+	+
Tankblot Eco-Maxi	018-401	+								+	+	+
Blot Module Eco-Maxi	018-405									+	+	+

3.2 Unpack and Check

Unpack and carefully examine the Eco-Line apparatus. Examine for signs of damage and check the contents against the packing list. Report any damage to BIOMETRA. Do not attempt to operate this device if physical damage is present.

Please keep the original packing material for return shipment in case of service issues

!! Attention !!

Please fill out and send back the warranty registration card. This is important for you to claim full warranty.

3.3 Installation Conditions

Place the chamber in proximity to the Power Pack with which it is to be connected. Be sure to place the chamber in a safe, dry location away from the edge of the working surface.

3.4 Connecting Conditions

The Eco-Mini Family apparatus have been designed to operate with D.C. current.

⎓ **Warning: The apparatus must not be earthed.**

4 Components

4.1 Systems Overview

Eco-Mini System E, EB or EBC
Eco-Maxi System EB or EBC

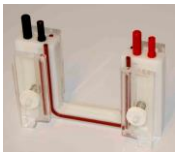
- Buffer Tank E, EB or EBC

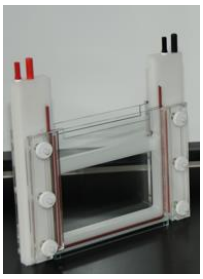
(Picture: Buffer Tanks Eco-Mini)

- Bigfoot Safety Lid with power cords

(Picture: Bigfoot Safety Lid Eco-Mini)

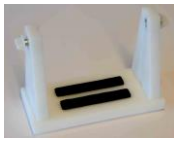
- Electrophoresis Module





(Picture: Electrophoresis Module Eco-Mini (left) and Eco-Maxi (right))

- Casting stand



Picture: (Casting Stand Eco-Mini (left) and Eco-Maxi (right))

Tankblot Eco-Mini or Eco-Mini C
Tankblot Eco-Maxi or Eco-Maxi C

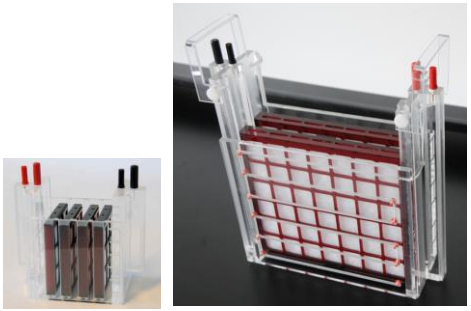
- Buffer Tank EB or EBC

(Picture: Buffer Tanks Eco-Mini)

- Bigfoot safety lid with power cords

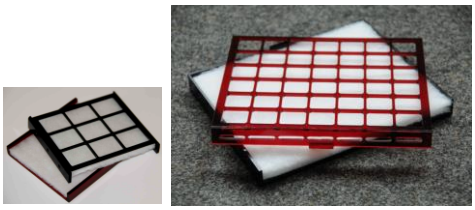
(Picture: Bigfoot Safety Lid Eco-Mini)

- Blot Module



(Picture: Blot Module Eco-Mini (left)and Eco-Maxi (right))

- Blotting Cassettes (colour coded)



(Picture: Blotting Cassette Eco-Mini (left) and Eco-Maxi (right))

4.2 Compatibility Overview

Buffer tank E for electrophoresis (Eco-Mini only)

Buffer tank EB for electrophoresis and blotting

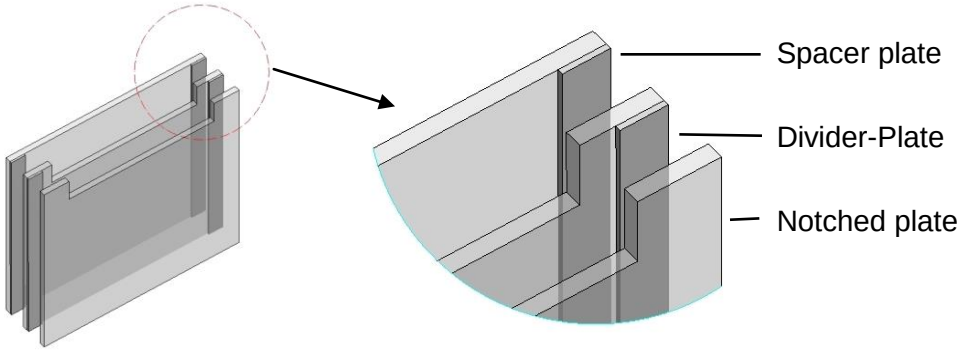
Buffer tank EBC for electrophoresis and blotting;
with integrated cooling

5 Electrophoresis

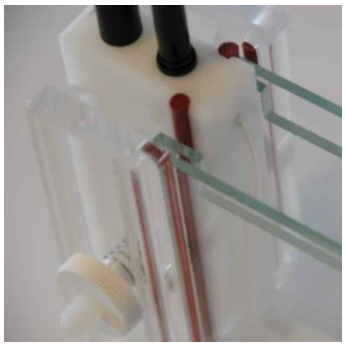
5.1 Gel Cassette Assembly

Clean and dry glass plates before use!

- Single-gel sandwiches: Select a spacer plate of the desired gel thickness and place the notched glass plate on top of it.
- Double-gel sandwiches: Select a spacer plate and divider-Plate of the desired gel thickness. Place the Devider-Plate on top of the spacer plate and the notched glass plate on top of the Divider-Plate.



- Prepare a second assembly if two gels will be needed.
- Slide the two glass plates assemblies (single-gel or double-gel sandwiches) or one assembly and one dummy plate into the Electrophoresis Module, keeping the notched glass plate faced to the front of the module and the spacer plate faced to the wall of the buffer tank:



- Ensure that the glass plates of each assembly are **flush on a level surface (not in the Casting Stand!**).

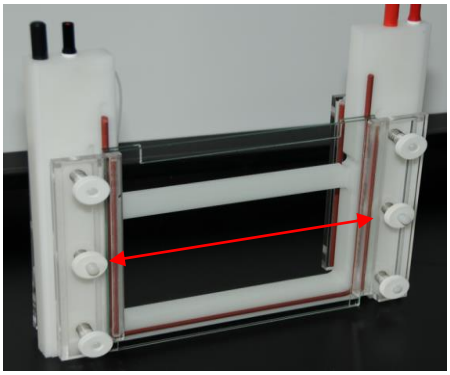
Leaking may occur if the plates are misaligned or damaged !

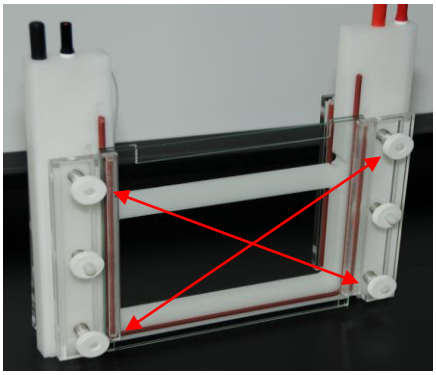
- Tighten side clamps of the Electrophoresis Module with the white screws before the Electrophoresis Module with the glass plate assemblies is placed into the Casting Stand:

Please take care that the screws are tightened alternating and strong enough. In case that the clamps are too loose the gel assembly could get out of place during gel casting.

For **Eco-Mini** there is only 1 screw per clamp.

For **Eco-Maxi** there are 3 srews per clamp. Make sure that the screws in the middle of each clamp are tightened first. After this tighten the diametrically opposed screws crosswise.



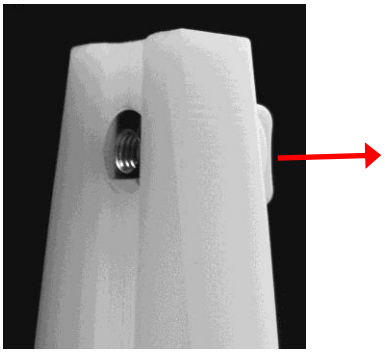


- Check that all glass plates are flush at the bottom.
- Tighten the Dummy plate in a similar way at the opposite side of the Electrophoresis Module in case of casting only a single gel.

The black Casting Stand gaskets must be clean and dry! Do not soak the gaskets for prolonged periods prior to casting gels.

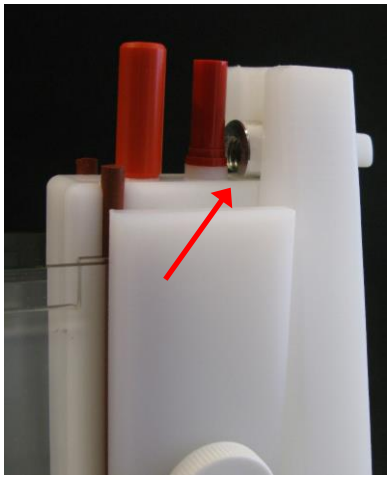
Take care that the black gaskets are exactly placed within the cavities in the stand and that they are inserted evenly.

Pull out both eccentric screws of the Casting Stand.



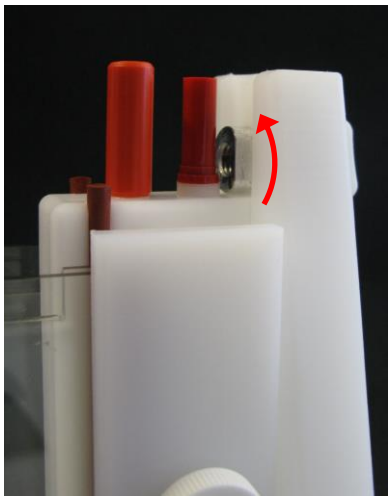
- Place the Electrophoresis Module with the glass plates assemblies straight down into the Casting Stand.

- Push the knob on each side of the Casting Stand with the **flat bottom** of the eccentric interlocking pin **downwards**.



- Now **simultaneously** turn the eccentric screws on both sides of the Casting Stand for approx. **half a turn.**

  Note: Don´t turn the eccentric screw more than approx. 180°! Otherwise the glass plates can be shifted upwards and would get leaky.



5.2 Gel Casting

- Place a comb into the assembled gel cassette (one comb per single-gel sandwich, 2 combs per double-gel sandwich).
- Mark the glass plate approx. 5 to 10 mm below the comb teeth.
- Remove the comb(s) and pour the running gel (resolving gel) up to this level.
- Prepare the running gel monomer solution by adding all reagents except APS and TEMED. Degas the solution under vacuum. (Do not use a sink water aspirator!)
- Add APS and TEMED to the degassed solution directly before pouring the gel.
- Use a glass or disposable plastic pipette and smoothly pour the solution up to the mark to prevent it from mixing with air.
- Overlay the solution with bidistilled water or water saturated n-butanol. Prevent mixing.
- Allow the gel to polymerise for approx. 30 to 60 minutes. Polymerisation is visible by the formation of a sharp dividing line between gel and overlay.
- Remove the overlay solution from the surface of the polymerised gel. (If using water saturated n-butanol rinse the gel surface with bidistilled water. Do not leave the

alcohol overlay on the gel for more than 1 h because this might dehydrate the top of the gel.)

- Prepare the stacking gel monomer solution by adding all reagents except APS and TEMED. Degas the solution under vacuum. (Do not use a sink water aspirator!)
- Dry the top of the running gel with a sheet a filter paper before pouring the stacking gel.
- Add APS and TEMED to the degassed solution directly before pouring the gel.
- Use a glass or disposable plastic pipette and smoothly pour the solution until the top of the notched glass plate is reached.
- Insert the desired comb between the two glass plates.
- Allow the gel to polymerise for approx. 30 to 60 minutes.
- Gentle remove the comb after polymerisation and rinse the wells carefully with bidistilled water or running buffer.

5.3 System Assembly and Sample Loading

- After polymerisation, lift the Electrophoresis Module with the gel assemblies from the Casting stand and slide into the selected buffer tank.
- Fill the buffer tank with the running buffer to the indicated max. level line.
- Fill the chamber formed by the assemblies and the Electrophoresis Module with running buffer to just under the edge of the outer (spacer) glass plate (approx. 5 mm from the top of the gel assembly). Make sure the buffer level is above the gap formed by the “ears” of the notched glass plate.
- Dissolve the samples in sample buffer and carefully load into the wells of the stacking gel.
- Set the bigfoot safety lid onto the unit. Because of its asymmetric design this will only work in the proper orientation, connecting the electrode of the buffer tank (anode) with the red power cord and the Electrophoresis Module (cathode) with the black power cord.

5.4 Electrophoresis

- Connect the safety plugs to a suitable Power Supply (e.g. Standard Power Pack P25 or P25T).
- Be aware that the plus pole (red) is connected to the lower buffer reservoir.
- Apply power to the apparatus and begin electrophoresis:
  Eco-Mini:
  const. 10 mA per gel is recommended for the pre-run and const. 25 mA per Gel is recommended for the separation run. The max. Voltage has to be limited at 200 V. Run time is depending on buffer and gel composition and should be approx. 60 min. to 120 min. for SDS-PAGE.

Please notice: Compared to single-gel sandwiches the run time for double-gel sandwiches is approx. 25% longer!

Eco-Maxi:
const. 15- 25 mA per gel is recommended for the pre-run and const. 50 - 60 mA per Gel is recommended for the separation run. The max. Voltage has to be limited at 400 V. Run time is depending on buffer and gel composition and should be approx. 4 – 6 hours for SDS-PAGE.

5.5 System Reassembly and Gel Removal

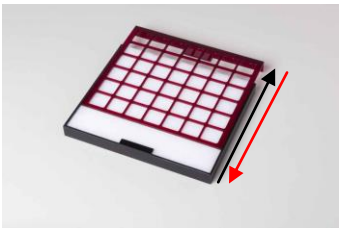
- After electrophoresis is completed, turn off the Power Supply and disconnect the safety plugs.
- Remove the Bigfoot Safety Lid and slide out the Electrophoresis Module with the assemblies by carefully bending the Module towards the side with the Eco-Line logo before lifting.
- Discard the running buffer.
- Loosen side clamps and remove gel assemblies.

6 Tankblotting

6.1 Assembling the Gel Sandwich

For gel sandwich assembly, mounting of blotting cassettes inside the buffer tank EB or EBC and connecting to a power supply make sure that the membrane is placed at the side of the gel which is close to the anode (positive electrode side, red-coloured) if the target molecule are negatively charged.

- Pre-cool transfer buffer over night at 4°C.
- After electrophoresis, immediately remove the gel from the bottom plate. Tip the plate up side down, starting at one edge allow the gel to roll off into the transfer buffer.
- Pre-equilibrate the gel in cool transfer buffer for 15 minutes with gentle agitation to remove SDS and salts. This prevents the gel to change size during the blotting transfer and reduces heating effects.
- Cut blotting paper (e.g. Whatman 3MM or GB005) to the size of the gel (or the size of the cassette) and soak 2 x 3 layers of thin (0.34 mm) or 2 x 1 layer of thick (approx. 1mm) with transfer buffer.
- Wearing gloves, cut the membrane to the size of the gel and blotting paper.
- Mark the membrane to indicate the side that the samples will be on.
- Wet the membrane according to the manufacturers' recommendations, followed by equilibration in transfer buffer for 15 minutes.
- Soak 2 foam pads in transfer buffer.
- Building up the gel sandwich is best done in a shallow plastic box:
- Open the blotting cassette and place the cassette with the **black side down** on a flat surface.
- Place a foam pad pre-soaked with transfer buffer in the black half of the blotting cassette, followed by 3 layers of thin or 1 layer of thick filter paper pre-soaked with buffer.
- Gently place the gel on top of the pre-soaked filter paper. Beginning at one end of the gel, align the filter papers with the gel edge and slowly lower the other end, driving out any bubbles. Use a clean glass rod wetted in transfer buffer to roll out any trapped bubbles.
- Carefully align and overlay the transfer membrane onto the gel in one smooth action. Work from the centre and let the ends roll down. Never re-position the membrane as some transfer may occur on contact. Use a clean glass rod wetted in transfer buffer to roll out any trapped bubbles.
- Add 3 layers of thin or 1 layer of thick filter paper pre-soaked with buffer on top of the membrane.
- Complete the sandwich with a foam pad pre-soaked in blotting buffer followed by the red half of the blotting cassette.



Eco-Maxi

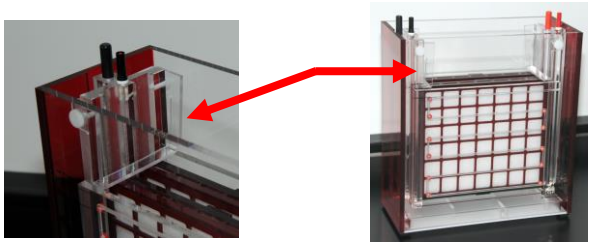
Eco-Mini

- Insert the cassette into the Blotting Module. Take care that the red side of the blotting cassette is located at the side of the Blotting Module with the red-coloured electrode (Eco-Mini) or at the side of the Blot Module with the red-coloured screws for fixing the electrode (Eco-Maxi).
- Up to 2 cassettes can be inserted into the Blotting Module of Eco-Maxi and up to 4 cassettes can be inserted into the Blotting Module of Eco-Mini.

6.2 Setting up the Buffer Tank (EB or EBC)

- Cool and degas the appropriate volume of transfer buffer:
  approx. 2,100 ml for use with **Eco-Mini** or
  approx. 6,100 ml for use with **Eco-Maxi**.
- Fill the buffer tank half to two-third with transfer buffer.
- Connect the cooling supply to the tank base connectors (max. 0.5 l/min., use hose clips to secure the tubing) or place the system into a cold room.
- Add a stir bar (approx. 5 cm in length) to the tank to maintain uniform temperature and conductivity during the blotting transfer.
- Adjust mixing device to max. 200 rpm.
- Slide the Blotting Module into the buffer tank.
- Insert up to 4 cassettes into the Blotting Module of **Eco-Mini** or

insert up to 2 cassettes into the Blotting Module and turn the locking handles on both sides downwards at **Eco-Maxi**.



- Add transfer buffer up to the marked level.
- Place the Bigfoot Safety Lid on the buffer tank and connect the attached power cords to an appropriate power supply.
- Start the blotting transfer.

6.3 Transfer of more than one Gel

Transfer efficiencies might decrease if more than 1 blotting cassette is inserted. In this case, transfer times have to be increased to get the same transfer efficiencies as if blotting a single gel sandwich.

6.4 Transfer Times and Conditions

The best transfer time has to be determined experimentally. There is no formula for determining transfer tine since there are too many variables involved to give specific transfer conditions.
To optimise transfer times it is useful to stain the gel as well as the membrane using a general staining method (e.g. Coomassie blue or silver stain for protein gels and Ponceau red for proteins on membranes) and to compare the results with an identical gel which has not been blotted.

6.5 System Reassembly and Blot Removal

- After electrophoresis is completed, turn off the Power Supply and disconnect the safety plugs.
- Remove the Bigfoot Safety Lid and slide out the Blotting Module with the blotting cassettes by carefully bending the Module towards the side with the Eco-Line logo before lifting.
- Discard the running buffer.
- Remove the blotting cassettes.

7 Buffers and Staining/Destaining Solutions

7.1 Gel Solutions:

Running Gel

Eco-Mini

(5.5 ml per 0.75 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	1.4	1.8	2.3	2.8	3.2
1.88 M Tris/HCl, pH 8.8 (ml)	1.1	1.1	1.1	1.1	1.1
0.5% SDS (ml)	1.1	1.1	1.1	1.1	1.1
dist. H_2O (ml)	1.9	1.5	1.0	0.5	0.0
TEMED (µl)	5	5	5	5	5
10% APS (µl)	28	28	28	28	28

(7 ml per 1 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	1.7	2.3	2.9	3.5	4.1
1.88 M Tris/HCl, pH 8.8 (ml)	1.4	1.4	1.4	1.4	1.4
0.5% SDS (ml)	1.4	1.4	1.4	1.4	1.4
dist. H_2O (ml)	2.5	1.9	1.3	0.7	0.1
TEMED (µl)	6	6	6	6	6
10% APS (µl)	35	35	35	35	35

(10.5 ml per 1.5 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	2.6	3.5	4.4	5.3	6.1
1.88 M Tris/HCl, pH 8.8 (ml)	2.1	2.1	2.1	2.1	2.1
0.5% SDS (ml)	2.1	2.1	2.1	2.1	2.1
dist. H_2O (ml)	3.7	2.8	1.9	1.1	0.2
TEMED (µl)	9	9	9	9	9
10% APS (µl)	53	53	53	53	53

Running Gel

Eco-Maxi

(25 ml per 0.75 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	6.1	8.2	10.4	12.5	14.6
1.88 M Tris/HCl, pH 8.8 (ml)	5.0	5.0	5.0	5.0	5.0
0.5% SDS (ml)	5.0	5.0	5.0	5.0	5.0
dist. H_2O (ml)	8.9	6.8	4.6	2.5	0.4
TEMED (µl)	21	21	21	21	21
10% APS (µl)	125	125	125	125	125

(33 ml per 1 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	8.0	10.8	13.7	16.5	19.3
1.88 M Tris/HCl, pH 8.8 (ml)	6.6	6.6	6.6	6.6	6.6
0.5% SDS (ml)	6.6	6.6	6.6	6.6	6.6
dist. H_2O (ml)	11.8	8.9	6.1	3.3	0.5
TEMED (µl)	28	28	28	28	28
10% APS (µl)	165	165	165	165	165

(49 ml per 1.5 mm gel)

Percent Gel	**7.5%**	**10.0%**	**12.5%**	**15.0%**	**17.5%**
30:0.8 Acrylamide/Bis (ml)	11.9	16.1	20.3	24.5	28.7
1.88 M Tris/HCl, pH 8.8 (ml)	9.8	9.8	9.8	9.8	9.8
0.5% SDS (ml)	9.8	9.8	9.8	9.8	9.8
dist. H_2O (ml)	17.5	13.3	9.1	4.9	0.7
TEMED (µl)	42	42	42	42	42
10% APS (µl)	245	245	245	245	245

Stacking Gel, 5%

Eco-Mini

Gel Thickness	**0.75 mm**	**1.0 mm**	**1.5 mm**
Gel Volume	**1.5 ml**	**2 ml**	**2.5 ml**
Acrylamide/Bis 30:0.8 (ml)	0.2	0.3	0.4
0.625 M Tris/HCl pH 6.8 (ml)	0.3	0.4	0.5
0.5% SDS (ml)	0.3	0.4	0.5
dist. H_2O (ml)	0.7	0.9	1.1
TEMED (µl)	2	2	3
10% APS (µl)	8	10	13

Eco-Maxi

Gel Thickness	**0.75 mm**	**1.0 mm**	**1.5 mm**
Gel Volume	**2.5 ml**	**3.5 ml**	**5.0 ml**
Acrylamide/Bis 30:0.8 (ml)	0.3	0.5	0.8
0.625 M Tris/HCl pH 6.8 (ml)	0.5	0.7	1.0
0.5% SDS (ml)	0.5	0.7	1.0
dist. H_2O (ml)	1.2	1.6	2.2
TEMED (µl)	3	4	6
10% APS (µl)	13	18	26

Attention:

The ammonium persulphate solution (10%) should be prepared fresh every day and should be stored at 4°C (refrigerator).

7.2 Electrophoresis Buffer solutions:

SDS-Sample Buffer
for SDS-PAGE gels under reducing conditions

2 ml	0.625 M Tris/HCl pH 6.8
0.2 g	SDS
5 ml	Glycerol
0.5 ml	ß-Mercaptoethanol
0.1 ml	Bromophenol Blue (1% in ethanol)
2.4 ml	dist. H_2O

Attention:

Dilute the sample buffer 1 to 2 with the sample (= 1 vol. buffer + 1 vol. sample)

Running Buffer pH 8.3 (5 liter):

15.1 g	Tris-Base
72.0 g	Glycine
5.0 g	SDS

Running Buffer pH 8.3 (10 liter):

30.2 g	Tris-Base
144.0 g	Glycine
10.0 g	SDS

7.3 Blotting Buffer Solutions:

Most transfer buffers for SDS PAGE gels are Tris/Glycin buffers (pH=8.3). At this pH the negatively charged proteins will move to the anode. Using a transfer buffer with acidic pH will return the moving direction because the positively charged proteins will move to the cathode.

Typical transfer buffers are:

- 20 mM Tris / 150 mM Glycine (pH=8.3),
- 7.5 mM Tris / 1.2 mM Boric Acid (pH=8.9) or
- 25 mM Sodium Phosphate (pH=6.5)

Towbin-buffer is the most commonly used buffer. It works well for transfer over night (12 h) at const. 100 mA.

Towbin Buffer:

20 – 25 mM	Tris-Base
150 – 192 mM	Glycin
15 - 25 %	Methanol
0.02 – 0.1 %	SDS
pH = 8.1 – 8.5	

The pH of Towbin-buffer will not be adjusted and is dependent on the quality of the water and chemicals. The buffer should be degassed prior to the addition of SDS and cooled to 4°C.
Higher concentration of SDS will increase transfer efficiency of proteins from the gel. However, this might lower binding capacity of the membrane.

A good buffer with higher ion strength for more quick transfer rates is **50 mM CAPS** at pH=9.2. The pH of this buffer has to be adjusted with NaOH !

A very good buffer for quick transfer is **25 mM Na_2HPO_4** at pH=9.0 (+/- 0.1). This buffer should be used at const. 300 mA.

A special transfer buffer for acidic gels with basic proteins, IEF gels and urea gels is **0.7% Acetic Acid**.

Using acetic acid, the transfer direction is reverse (from “+” to “–“) and transfer times are approx. 50% shorter than with use of “standard” transfer buffers like Towbin Buffer!

A special transfer buffer for Glycoproteins, Polysaccharides and Lipoproteins is **10 mM Sodium Borate** pH=9.2.

7.4 Staining and Destaining solutions:

Staining Solution (1 liter)

2.0 g	Coomassie Brilliant Blue R 250
0.5 g	Coomassie Brilliant Blue G 250
425 ml	Ethanol
50 ml	Methanol
100 ml	Acetic Acid
425 ml	bidest. Water

Attention:

Stir overnight; filtrate before use; store in dark bottle!

Destaining Solution

fast destaining in:

45%	Ethanol
10%	Acetic Acid
75%	bidest. Water

slow destaining in:

25%	Isopropanol
10%	Glacial Acid
45%	bidest. Water

final destaining in:

7%	Acetic Acid in bidest. water

8 Trouble Shooting

8.1 Electrophoresis

Problem	Cause	Corrective Actions
Leakage of gel solution	Glass plates have not been aligned correctly	Ensure that the two glass plates of the assembly are flush on a level surface.
	Glass plates or spacers are dirty.	Clean thoroughly.
	Uneven/damaged edges of glass plates.	Use only glass plates that are not damaged.
	Gasket of Casting Stand is dirty.	Clean thoroughly with a mild detergent and rinse with distilled water. Dry without smearing.
	Gasket of Casting Stand is damaged.	Replace gasket
Electrophoresis Modul assembly is leaking	Gaskets of the Electrophoresis Module are deformed, dirty or too old.	Remove gaskets, wash in warm water to remove excess of salts, and place each gasket back into its groove. If the gaskets are to old or brittle, they have to be replaced.
Running time is too long	Buffer is too much diluted.	Check buffer recipe and dilution. Try again with fresh buffer.
	Electrophoresis Modul assembly is leaking.	See above.
	Running at too low current or voltage.	Make sure you are running using the suggested running conditions. For running at const. current, the current value is per gel.
Running too fast	Buffer is too concentrated.	Check buffer recipe and dilution. Try again with fresh buffer. If voltage is lower than usual (when running at const. current) the buffer is probably too concentrated.
	Current of voltage set too high.	Turn down electrical settings.
Smiling of the dye front	Center of the gel is hotter than the sides.	Turn down electrical settings.

Problem	Cause	Corrective Actions
Bands spreading outwards	Diffusion of sample when loading.	Load samples as quick as possible and start the electrophoresis run a.s.a.p. after loading.
	Diffusion of sample during run in the stacking gel.	Increase % of stacking gel or increase current up to 25% for the run in the stacking gel.
	Lower ionic strength of sample.	Match the ionic strength of the sample with that of the gel.
Bands are narrower than sample wells	Ionic strength of the sample is higher than ionic strength of the gel.	De-salt the sample. Use sample buffer of the same ionic strength as the gel.
Broad lanes at bottom of gel	Samples with different buffers are loaded. (normal in gradient gels.)	Use identical sample buffer for all samples loaded.
Skewed bands	Gel not polymerised properly at the wells.	De-gas gel solution before casting and/or increase APS and TEMED concentration. Control expiring date of the used solutions.
	Salt concentration in the sample is too high.	De-salt samples.
	Separation gel is uneven at the top.	Overlay the gel carefully during polymerisation with bidistilled water or water saturated n-butanol. Make sure the Casting stand is levelled.
	The Electrophoresis Module assembly is leaking through the gel and/or along the side spacers.	Check that the gel is a solid gel inside the glass plates and check the setup of the apparatus to make sure that sealing with the gasket is perfect. Check that spacer and com thickness are identical.
Streaked bands	Sample overloading.	Use lower concentration for next run.
	Sample precipitation.	Centrifuge sample before adding sample buffer and/or use a lower % acrylamide gel.
“Frowning” of outside lanes	Leakage of buffer along the sides.	Ensure that the two glass plates of the assembly are flush on a level surface.

Problem	Cause	Corrective Actions
Double bands	Re-oxidation or insufficient reduction of the sample.	If using a reducing reagent make sure that the buffer is not too old. Increase the concentration of 2-mercapto-ethanol or dithiothreitol (DTT) in the sample.

8.2 Tankblotting

Problem	Cause	Corrective Actions
No transfer	Wrong order of membrane and gel	Reverse order of membrane and gel: gel on top of membrane
	Wrong connection to the Power Supply	Exchange connection: Red = anode (+) Black = cathode (-)
	Acidic buffer system: transfer towards cathode!	Place transfer membranes on cathode side (lid) and gel on anode side (base)
Incomplete transfer	Transfer time too short (check by gel staining)	Increase transfer time
	Transfer time too long: "blow through" (i.e. proteins are stained on both sides of the membrane)	Reduce transfer time. Use nitrocellulose with smaller pore size or PVDF membrane
Irregular transfer	Air bubbles in the blot sandwich	Remove air bubbles by gently rolling e.g. a pasteur pipette over the membrane
	Generation of air bubbles with long transfer times by electrolysis and heating up	Reduce transfer time, chill buffer before use.
	Irregular current flow as size of blotting papers and transfer membrane are larger than gel size	Transfer membranes and blotting papers must be cut exactly to gel size
	Blotting paper partially dried	Reduce transfer time
	Insufficiently soaked transfer membrane	Check procedure for prewetting membrane
	Spoiled electrodes	Clean electrodes
Proteins are stained on both sides of the membrane	Transfer time to long: "blow through"	Reduce transfer time. Use nitrocellulose with smaller pore size or PVDF membrane
Power Supply turns off	Power Supply does not work at low voltages (inner resistance too high)	Use proper Power Supply which can operate at low voltages (e.g. Standard Power Pack P25)
Strong increase of voltage during transfer	Blot sandwich dries out	Reduce amperage (soak blotting paper cuts with more transfer buffer)
	Generation of air bubbles on the electrodes by electrolysis	Chill buffers before use / Reduce transfer time
	Insufficiently soaked transfer membrane	Check procedure for prewetting membrane

Problem	Cause	Corrective Actions
Intensive heating up	Amperage too high	Reduce amperage / Reduce transfer time
	Transfer time too long	Chill buffers before use / Reduce transfer time
	Conductivity of buffer too high	Check transfer buffers / Use buffers described in this manual

9 Product Information

Apparatus (Eco-Mini):

017-100 **Eco-Mini System E**
Complete system with buffer tank E, Bigfoot Safety Lid, Electrophoresis Module, 2 sets of glass plates with fixed **1 mm** spacers, 1 Dummy plate, 2 combs (10 wells), **Casting Stand** and manual
Note: *buffer tank E is not compatible with Blot Module 018-105*

017-101 **Eco-Mini E**, dto., but without Casting Stand

017-102 **Eco-Mini System EB**
Complete modular system with buffer tank EB (without cooling base), Bigfoot Safety Lid, Electrophoresis Module, 2 sets of glass plates with fixed **1 mm** spacers, 1 Dummy plate, 2 combs (10 wells), **Casting Stand** and manual
Note: *buffer tank EB can be used with Blot Module 018-105*

017-103 **Eco-Mini EB**, dto., but without Casting Stand

017-104 **Eco-Mini System EBC**
Complete modular system with buffer tank EBC (with cooling base), Bigfoot Safety Lid, Electrophoresis Module, 2 sets of glass plates with fixed **1 mm** spacers, 1 Dummy plate, 2 combs (10 wells), **Casting Stand** and manual
Note: *buffer tank EB can be used with Blot Module 018-105*

017-105 **Eco-Mini EBC**, dto., but without Casting Stand

018-100 **Tankblot Eco-Mini C**
Complete modular system with buffer tank EBC (with cooling base), Bigfoot Safety Lid, Blot Module, 4 Blotting Cassettes (colour-coded), 8 foam pads and manual
Note: *buffer tank EBC can be used with Gel Module 017-175*

018-101 **Tankblot Eco-Mini**
Complete modular system with buffer tank EB (without cooling base), bigfoot lid, Blot Module, 4 colour-coded Blotting Cassettes, 8 foam pads and manual
Note: *buffer tank EBC can be used with Gel Module 017-175*

Accessories (Eco-Mini):

017-180	**Casting Stand** (two-place) for Eco-Mini
017-169	**Buffer tank E** for Eco-Mini; without lid; for electrophoresis only
017-170	**Buffer tank EB** for Eco-Mini; without lid; for electrophoresis and blotting
017-171	**Buffer tank EBC** for Eco-Mini; without lid; for electrophoresis and blotting, with cooling base
017-172	**Bigfoot Safety Lid** for Eco Mini; fits to all buffer tanks
017-175	**Electrophoresis Module** for Eco-Mini; for 2 gels; fits to all buffer tanks
017-120	Glass plate for Eco-Mini; with fixed spacers, 1mm
017-121	Glass plate for Eco-Mini; with fixed spacers, 0.75mm
017-122	Glass plate for Eco-Mini; with fixed spacers, 1.5mm
017-125	Notched glass plate for Eco-Mini
017-127	Dummy plate for Eco-Mini
017-183	**Divider-Plate** with fixed spacers, 1.0 mm
017-184	**Divider-Plate** with fixed spacers, 0.75 mm
017-185	**Divider-Plate** with fixed spacers, 1.5 mm
017-187	**Divider-Plate Set** (2 divider-Plates and 2 combs, 10 well), 1.0 mm
017-188	**Divider-Plate Set** (2 divider-Plates and 2 combs, 10 well), 0.75 mm
017-189	**Divider-Plate Set** (2 divider-Plates and 2 combs, 10 well), 1.5 mm
017-130	Comb for Eco-Mini; 9 teeth, 0.75mm, MTP compatible
017-131	Comb for Eco-Mini; 10 teeth, 0.75mm
017-132	Comb for Eco-Mini; 12 teeth, 0.75mm
017-133	Comb for Eco-Mini; 15 teeth, 0.75mm
017-134	Preparative comb for Eco-Mini; 1 well plus 2 marker wells, 0.75mm
017-140	Comb for Eco-Mini; 9 teeth, 1.0mm, MTP compatible
017-141	Comb for Eco-Mini; 10 teeth, 1.0mm, MTP compatible
017-142	Comb for Eco-Mini; 12 teeth, 1.0mm, MTP compatible
017-143	Comb for Eco-Mini; 15 teeth, 1.0mm, MTP compatible
017-144	Preparative comb for Eco-Mini; 1 well plus 2 marker wells, 1.0mm
017-150	Comb for Eco-Mini; 9 teeth, 1.5mm, MTP compatible
017-151	Comb for Eco-Mini; 10 teeth, 1.5mm, MTP compatible
017-152	Comb for Eco-Mini; 12 teeth, 1.5mm, MTP compatible
017-153	Comb for Eco-Mini; 15 teeth, 1.5mm, MTP compatible
017-154	Preparative comb for Eco-Mini; 1 well plus 2 marker wells, 1.5mm
018-105	**Blot Module** for Tankblot Eco-Mini
018-111	Blotting cassette for Tankblot Eco-Mini; colour-coded, for 1 mini gel
018-113	Foam pads for Tankblot Eco-Mini; 4 pcs (for two cassettes)

Apparatus (Eco-Maxi):

017-400 **Eco-Maxi System EB**
Complete modular system with buffer tank EB (without cooling base), Bigfoot Safety Lid, Electrophoresis Module, 2 glass plates with fixed **1.0 mm** spacers, 2 notched glass plates, 2 combs (1 mm, 12 wells), **Casting Stand** and manual
Note: *buffer tank EB can be used with Blot Module 018-405*

017-401 **Eco-Maxi EB,** dto., but without Casting Stand

017-402 **Eco-Maxi System EBC**
Complete modular system with buffer chamber EBC (with integrated cooling base), Bigfoot Safety Lid, Electrophoresis Module, 2 glass plates with fixed **1.0 mm** spacers, 2 notched glass plates, 2 combs (1 mm, 12 wells), **Casting Stand** and manual

017-403 **Eco-Maxi EBC**, dto., but without Casting Stand

018-400 **Tankblot Eco-Maxi C**
Complete modular system with buffer chamber EBC (with integrated cooling base), Bigfoot Safety Lid, 2 Blotting Cassettes (colourcoded, each for 1 gel with size 22 cm x 19 cm), 4 foam pads and manual
Note: *buffer tank EBC can be used with Electrophoresis Module 017-475*

018-401 **Tankblot Eco-Maxi**
Complete modular system with buffer chamber EB (without cooling base), Bigfoot Safety Lid, 2 Blotting Cassettes (colour-coded, each for 1 gel with size 22 cm x 19 cm), 4 foam pads and manual
Note: *buffer tank EB can be used with Electrophoresis Module 017-475*

Accessories (Eco-Maxi):

017-480	**Casting Stand** (two-place) for Eco-Maxi
017-471	**Buffer tank EB** for Eco-Maxi; without bigfoot safety lid
017-472	**Buffer tank EBC** for Eco-Maxi; without bigfoot safety lid
017-474	**Bigfoot Safety Lid** for Eco-Maxi; fits to all buffer tanks
017-475	**Electrophoresis Module** for Eco-Maxi; for 2 gels
017-420	Glass plate for Eco-Maxi; with fixed spacers, 1 mm
017-421	Glass plate for Eco-Maxi; with fixed spacers, 0.75 mm
017-423	Glass plate for Eco-Maxi; with fixed spacers, 1.5 mm
017-425	Notched glass plate for Eco-Maxi
017-426	Dummy plate for Eco-Maxi
017-430	Comb for Eco-Maxi; 12 teeth, 0.75 mm
017-431	Comb for Eco-Maxi; 19 teeth, 0.75 mm, MTP compatible
017-432	Comb for Eco-Maxi; 25 teeth, 0.75 mm
017-433	Comb for Eco-Maxi; 30 teeth, 0.75 mm
017-434	Preparative comb for Eco-Maxi; 1 well plus 2 marker wells, 0.75 mm
017-440	Comb for Eco-Maxi; 12 teeth, 1.0 mm
017-441	Comb for Eco-Maxi; 19 teeth, 1.0 mm, MTP compatible
017-442	Comb for Eco-Maxi; 25 teeth, 1.0 mm
017-443	Comb for Eco-Maxi; 30 teeth, 1.0 mm
017-444	Preparative comb for Eco-Maxi; 1 well plus 2 marker wells, 1.0 mm
017-450	Comb for Eco-Maxi; 12 teeth, 1.5 mm
017-451	Comb for Eco-Maxi; 19 teeth, 1.5 mm, MTP compatible
017-452	Comb for Eco-Maxi; 25 teeth, 1.5 mm
017-453	Comb for Eco-Maxi; 30 teeth, 1.5 mm
017-454	Preparative comb for Eco-Maxi; 1 well plus 2 marker wells, 1.5 mm
018-405	**Blot Module** for Tankblot Eco-Maxi, for up to 2 Blotting Cassettes (each for 1 gel with size 22 cm x 19 cm) and 4 foam pads
018-411	Blotting cassette, colour coded (black/red) for Tankblot Eco-Maxi Blot Module, 1 pcs
018-413	Foam pads for Tankblot Eco-Maxi; 4 pcs (for two cassettes)

Blotting Paper:

10 426 981	Whatman GB005, 200 mm x 200 mm, 1.2 mm thick, 25 sheets
10 426 994	Whatman GB005, 580 mm x 580 mm, 1.2 mm thick, 25 sheets
3017915	Whatman 17Chr, 460 mm x 570 mm, 0.92 mm thick, 100 sheets
3030 931	Whatman 3MM, 580 mm x 680 mm cm, 0.34 mm thick, 100 sheets

Nitrocellulose Blotting Membranes:

10 401 396	Whatman Protran-BA83, Pore size 0.20 µm, 30 cm x 3 m roll
10 401 196	Whatman Protran-BA85, Pore size 0.45 µm, 30 cm x 3 m roll
10 401 180	Whatman Protran-BA85, Pore size 0.45 µm, 30 cm x 60 cm, 5 sheets/pack
10 402 580	Whatman Protran-BA85, Pore size 0.45 µm, 33 cm x 56 cm, 5 sheets/pack
10 439 196	Whatman Protran-BA-S 85, Pore size 0.45 µm, 30 cm x 3 m roll

Eco-Line

Overview

Eco-Line Overview

Item	Order No.	Components included: Buffer chamber E	Buffer chamber EB	Buffer chamber EBC with cooling option	Bigfoot Safety Lid	Electrophoresis Module	2 x glass plates with fixed spacers, 1.0 mm	2 x notched glass plates	Dummy Plate	2 x comb, 1.0 mm	Casting Stand	Blot Module	blotting cassettes	foam pads
Polyacrylamide Gel Electrophoresis														
Eco-Mini System E	017-100	+			+	+	+	+	+	+	+			
Eco-Mini E	017-101	+			+	+	+	+	+	+				
Eco-Mini System EB	017-102		+		+	+	+	+	+	+	+			
Eco-Mini EB	017-103		+		+	+	+	+	+	+				
Eco-Mini System EBC with cooling option	017-104			+	+	+	+	+	+	+	+			
Eco-Mini EBC with cooling option	017-105			+	+	+	+	+	+	+				
Eco-Maxi System EB	017-400		+		+	+	+	+		+	+			
Eco-Maxi EB	017-401		+		+	+	+	+		+				
Eco-Maxi System EBC with cooling option	017-402			+	+	+	+	+		+	+			
Eco-Maxi EBC with cooling option	017-403			+	+	+	+	+		+				
Tank Blot Apparatus														
Tankblot Eco-Mini C with cooling option	018-100			+	+							+	+	+
Tankblot Eco-Mini	018-101		+		+							+	+	+
Tankblot Eco-Maxi C with cooling option	018-400			+	+							+	+	+
Tankblot Eco-Maxi	018-401		+		+							+	+	+

* Indication of buffer chamber:
E = Electrophoresis
EB = Blotting
EBC = Cooling option

10 Maintenance and Repair

10.1 Cleaning and Maintenance

Rinse buffer tank, bigfoot lid, Electrophoresis Module, Blot Module, Blotting cassettes and Casting Stand thoroughly with running water and finally with distilled water after every use.

It is recommended to allow the chamber and Electrophoresis or Blotting Module to air dry rather than drying with a towel to avoid damage of the electrode.

Glass plates and combs should be washed with a laboratory detergent and then rinsed thoroughly with distilled water.

Avoid extended submersion of spacer plates in water or cleaning solution. Limit submersion to time used for cleaning. Prolonged submersion compromises the integrity of the adhesive.

Do not use alcohol >10% (e.g. methanol, ethanol) or organic solvents (e.g. acetone) for cleaning of electrodes or housing as this will cause acrylic to crack.

The system should never be autoclaved or placed in a microwave.

10.2 Servicing

Regular servicing is not necessary. Nevertheless cleaning of the electrodes should be done using a damp cloth wetted with dest. water after each transfer.

In case that the electrodes are clogged after longer time of use and the blotting transfer is inhomogeneous or reduced, please contact the Biometra Service Department.

10.3 Replacement of Spare Parts

Only original spare parts mentioned in these operating instructions are allowed.

10.4 Other Accessories

See chapter 8 (Product Informations) for further details.

11 Service

Should you have any problems with this unit, please contact our service department or your local Biometra dealer:

Biometra GmbH
Service Department
Rudolf-Wissell-Straße 14 - 16
D-37079 Goettingen
Phone:+49 (0)5 51 50 68 6 - 10 or 12
Fax: +49 (0)5 51 50 68 6 -11
e-mail: Service@biometra.com

If you would like to send the unit back to us, please read the following return instructions.

11.1 Instructions for Return Shipment

- Return only defective devices. For technical problems which are not definitively recognisable as device faults please contact the Technical Service Department at Biometra (Tel.: +49 (0)5 51-50 88 1-10 or -12, Fax: +49 (0)5 51-50 88 1-11, e-mail: Service@biometra.com).
- Please contact our service department for providing **a return authorization number (RAN)**. This number has to be applied clearly visible to the outer box. **Returns without the RAN will be not be accepted!**
- **Important:** Carefully clean all parts of the instrument from residues, and of biologically dangerous, chemical or radioactive contaminants. If an instrument is contaminated, Biometra will be forced to refuse to accept the device. The sender of the repair order will be held liable for possible damages and losses resulting from insufficient decontamination of the device.

- Please **prepare written confirmation** (use the "**Equipment Decontamination Declaration**" following on the next page) that the device is free of biologically dangerous, chemical or radioactive contaminants. This confirmation must be attached to the outside of the packaging.
- Use the original packing or a similarly robust packing when returning the device. If not available, contact Biometra or your local distributor.
- Label the outside of the box with "CAUTION! SENSITIVE INSTRUMENT!" and the RAN number sticker. Attach the Decontamination Declaration!
- Please enclose a note which contains the following:
  a) Sender's name and address,
  b) Name of a contact person for further inquiries with telephone number.
  c) **Precise description of the fault**, which also reveals during which procedures the fault occurred, if possible.

12 Equipment Decontamination Certificate

To enable us to comply with German law (i.e. §71 StrlSchV, §17 GefStoffV and §19 ChemG) and to avoid exposure to hazardous materials during handling or repair, please complete this form, prior to the equipment leaving your laboratory.

COMPANY / INSTITUTE _____

ADDRESS _____

PHONE NO _____ FAX NO_____

E-MAIL _____

EQUIPMENT	Model	Serial No
	_____	_____
	_____	_____
	_____	_____
	_____	_____

If on loan / evaluation Start Date: _____ Finish Date _____

Hazardous materials used with this equipment:

_____

_____

_____

Method of cleaning / decontamination:

_____

_____

_____

The equipment has been cleaned and decontaminated:

NAME _____ POSITION _____
(HEAD OF DIV./ DEP./ INSTITUTE / COMPANY)

SIGNED _____ DATE _____

PLEASE RETURN THIS FORM TO BIOMETRA GMBH OR YOUR LOCAL BIOMETRA DISTRIBUTOR TOGETHER WITH THE EQUIPMENT.
PLEASE ATTACH THIS CERTIFICATE OUTSIDE THE PACKAGING. INSTRUMENTS WITHOUT THIS CERTIFICATE ATTACHED WILL BE RETURNED TO SENDER.

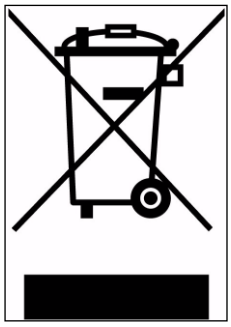
General Information for Decontamination:

Please contact your responsible health & safety officer for details.

Use of radioactive substances:
Please contact your responsible person for details.

Use of genetically change organism or parts of those:
Please contact your responsible person for details.

13 Note for Disposal of Electric/Electronic Waste



This symbol (the crossed-out wheelie bin) means, that this product should be brought to the return systems and/or separate systems available to end-users according to yours country regulations, when this product has reached the end of its lifetime!

For details, please contact your local distributor!

This symbol applies only to the countries within the EEA*.

*EEA = European Economics Area, comprising all EU-members plus Norway, Iceland and Liechtenstein.

14 EC – Declaration of Conformity / EU - Konformitätserklärung

Goettingen, January 2010

im Sinne der EG-Richtlinie für die elektromagnetische Verträglichkeit 2004/108/EG
following the EC directive about the electromagnetic compatibility 2004/108/EC

Hiermit erklären wir, dass folgende **Elektrophorese und Blotting Systeme**
Herewith we declare that the following ***Electrophoresis and Blotting Systems***

Typ / *type*:	Eco-Mini E, Eco-Mini System E, Eco-Mini EB, Eco-Mini System EB, Eco-Mini EBC, Eco-Mini System EBC, Eco-Maxi EB, Eco-Maxi System EB, Eco-Maxi EBC, Eco-Maxi System EBC, Tankblot Eco-Mini , Tankblot Eco-Mini C Tankblot Eco-Maxi, Tankblot Eco-Maxi C
Best.-Nr. / *Order No.*	017-100, 017-101, 017-102, 017-103, 017-104, 017-105, 017-400, 017-401, 017-402, 017-403, 018-100, 018-101, 018-400, 018-401

den grundlegenden Anforderungen der
corresponds to the basic requirements of

EG-Niederspannungsrichtlinie 2006/95/EG entsprechen.
EC low voltage directive 2006/95/EC.

Juergen Otte PhD
Quality Manager

15 Warranty

This laboratory instrument is produced with the highest practical standards of materials, workmanship, and design. The design and manufacture of parts have been conceived with one purpose - to produce units which will give satisfactory service.

Biometra GmbH guarantees this unit to be free from defects in materials or workmanship under normal use or service for **24 month** from date of shipment.

If, during this time, this unit proves defective in materials or workmanship, Biometra GmbH will repair or replace it free of charge if returned to us prepaid.

This guarantee does not cover damage in transit, damage caused by carelessness, misuse or neglect, or unsatisfactory performance as a result of conditions beyond our control; or consequential losses as a result of failure of our product.

Biometra GmbH

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Fax: +49 (0)5 51 50 68 6-66
e-mail: Info@biometra.com
internet: http://www.biometra.de

Service Department
Rudolf-Wissell-Str. 14-16
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Tel.: +49 (0)5 51 50 68 6-10 or -12
Fax.: +49 (0)5 51 50 68 8-11
e-mail: Service@biometra.com