

Minigel Family

Vertical
Polyacrylamide Gel electrophoresis Apparatus

Instruction Manual



Modell	Order No.
Minigel	010-000, 010-030, 010-040
Minigel-Twin	010-100, 010-130, 010-140
Multigel	010-200, 010-220, 010-230
Multigel-Long	010-300, 010-320, 010-330
Maxigel	010-400, 010-430, 010-440



!! Warning !!

**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!

1.0 Intended Uses And Specifications

The Biometra **Slabgels** are intended to be used for the fractionation of Proteins and DNA/RNA molecules in an vertical Polyacrylamid gelelectrophoresis

The **Minigel** (Code-No. 010-000) comes complete with all the accessories needed to cast and run 8.6 x 7.7 cm

(w x l) gels. Accessories included with this system are:

- main chamber for vertical gels (8.6 x 7.7 cm), including cooling device and safety-lid.
- One notched glass plate with straight edges (Code-No. 010-003).
- One glass plate with fixed 1.0 mm spacers (Code-No. 010-001).
- One comb, 10 wells, 1.0 mm (Code-No. 010-011).
- One silicone rubber seal, 1.0 mm (Code-No. 010-006).
- One sets of clips (à 3 pieces) (Code-No. 010-007)
- One Manual

The **Minigel-Twin** (Code-No. 010-100) comes complete with all the accessories needed to cast and run 8.6 x 7.7 cm (w x l) gels. Accessories included with this system are:

- main chamber for vertical gels (8.6 x 7.7 cm), including cooling device and safety-lid.
- Two notched glass plates with straight edges (Code-No. 010-003).
- Two glass plates with fixed 1.0 mm spacers (Code-No. 010-001).
- Two combs, 10 wells, 1.0 mm (Code-No. 010-011).
- Two silicone rubber seals, 1.0 mm (Code-No. 010-006).
- Two sets of clips (à 3 pieces) (Code-No. 010-007)
- One Manual

Accessories:

Glass plates:

Glass plates with fixed 1.0 mm spacers	Code-No. 010-001
Glass plates with fixed 0.6 mm spacers	Code-No. 010-002
Notched glass plate with straight edge	Code-No. 010-003
Notched glass plate with inclined edge	Code-No. 010-004

Combs, 1 mm:

1 well (preparative)	Code-No. 010-008
2 wells	Code-No. 010-022
3 wells	Code-No.010-009
5 wells	Code-No.010-010
10 wells	Code-No.010-011
10 wells for big samples or high protein concentrations	Code-No.010-023
20 wells	Code-No.010-012

Combs, 0.6 mm:

1 well (preparative)	Code-No. 010-013
2 wells	Code-No. 010-021
3 wells	Code-No.010-014
5 wells	Code-No.010-015
10 wells	Code-No.010-016
10 wells for big samples or high protein concentrations	Code-No.010-024
20 wells	Code-No.010-020

Others:

Silicone rubber seal, 1.0 mm	Code-No. 010-005
Silicone rubber seal, 0.6 mm	Code-No. 010-006
Clips 3 pcs.	Code-No. 010-007

The **Multigel** (Code-No. 010-200) comes complete with all the accessories needed to cast and run 11 x 7 cm (w x l) gels. Accessories included with this system are:

- main chamber for vertical gels (11 x 7 cm), including cooling device and safety-lid.
- Two notched glass plate with straight edges (Code-No. 010-201).
- Two glass plates with fixed 1.0 mm spacers (Code-No. 010-202).
- Two combs, 24 wells, 1.0 mm (Code-No. 010-204).
- Two silicone rubber seals, 1.0 mm (Code-No. 010-205).
- Three sets of clips (à 3 pieces) (Code-No. 010-007)
- One Manual

The **Multigel-Long (Code-No. 010-300)** comes complete with all the accessories needed to cast and run 11 x 12 cm (w x l) gels. Accessories included with this system are:

- main chamber for vertical gels (11 x 12 cm), including cooling device and safety-lid.
- Two notched glass plate with straight edges (Code-No. 010-301).
- Two glass plates with fixed 1.0 mm spacers (Code-No. 010-302).
- Two combs, 24 wells, 1.0 mm (Code-No. 010-204).
- Two silicone rubber seals, 1.0 mm (Code-No. 010-303).
- Four sets of clips (à 3 pieces) (Code-No. 010-007)
- One Manual

Accessories:

Glass plates:

Glass plates with fixed 1.0 mm spacers (Code-No. 010-202)
notched glass plate (Code-No. 010-201)

Combs:

12 wells, 1,0 mm (Code-No. 010-203)
24 wells, 1,0 mm (Code-No.010-204)

Others:

Silicone rubber seals, 1.0 mm (Code-No. 010-205)
Clips 3 pcs. (Code-No. 010-007)
12-channel pipette, variable, 5-50 µl volume in 0.1 µl steps (Code-No. 010-206)

The **Maxigel** (Code-No. 010-400) comes complete with all the accessories needed to cast and run 17 x 18 cm (w x l) gels. Accessories included with this system are:

- main chamber for vertical gels (17 x 18 cm), including cooling device and safety-lid.
- Two notched glass plate with straight edges (Code-No. 010-401).
- Two glass plates with fixed 1.0 mm spacers (Code-No. 010-402).
- Two combs, 12 wells, 1.0 mm (Code-No. 010-404).
- Two silicone rubber seals, 1.0 mm (Code-No. 010-417).
- Three sets of clips (à 3 pieces) (Code-No. 010-007)
- One set of Maxi-clips (à 4 pieces) (Code-No. 010-416)
- One Manual

Accessories:

Glass plates:

Glass plates with fixed 1.0 mm spacers	(Code-No. 010-402)
notched glass plate	(Code-No. 010-401)

Combs:





12 wells, 1.0 mm	(Code-No. 010-404)
18 wells, 1.0 mm	(Code-No. 010-405)
24 wells, 1.0 mm	(Code-No. 010-406)
1 well (2 marker lanes), 1.0 mm, preparative	(Code-No. 010-407)

Others:

Silicone rubber seals, 1.0 mm	(Code-No. 010-417)
Clips, 3 pcs.	(Code-No. 010-007)
Maxi-Clips, 4 pcs.	(Code-No. 010-416)


2.0 Safety and Warning Notices


2.1 Definition of Symbols


<u>Symbol</u>	<u>Definition</u>
	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.

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

 **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 Supply. The output of this Power Supply must be isolated from external ground to issue that the DC voltage output floats with respect to round. (All Biometra Power Supplies meet this safety requirement!)



Never place the instrument on top of a Power Supply.



Using the cooling option do not mix up the "in" and "out" plugs for the cooling water. The connection for the water cooling with the smaller diameter is the inlet the connection with the bigger diameter is the outlet.



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 !)



Operating Conditions:

	max. V (DC)	max. mA	max. W	max. Temp.
Minigel	400	25 (1 Gel)	10	50°C
Minigel-Twin	400	50 (2 Gele)	20	50°C
Multigel	400	70 (2 Gele)	28	50°C
Multigel-Long	450	70 (2 Gele)	32	50°C
Maxigel	500	120 (2 Gele)	60	50°C



Lengthy transfer times are not recommended. Do not leave the instrument unattended. Joule heat can be generated during electrophoresis. Electrophoresis runs longer than 4-6 hours at max. settings can damage the unit.



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



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.

3.0 Set Up

3.1 Unpack and Check

Unpack and carefully examine the electrophoresis unit. Report any damage to BIOMETRA. Do not attempt to operate this device if physical damage is present. Save all packing material if damage is found.

 **!! Attention !!** 
Please fill out and send back the warranty registration card. This is important for you to claim to full warranty: both parts and repair are covered within the full warranty period!

3.2 Electricity Supply

This electrophoresis chamber has been designed to operate with D.C. current.



Warning: This supply must not be earthed.

3.3 Important Electrical Safety Notes

Do not operate this equipment if any of the following conditions exist:

- If buffer leaks from the main electrophoresis chamber.
- If cracks are present in the electrophoresis chamber or safety cover.
- If the electrical connection cables are worn or frayed.

4.0 Location

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.

5.0 Handling

5.1 Mounting the glass plates:

Put one silicone rubber seal between two thoroughly cleaned glass plates (one glass plate with fixed spacers, one notched glass plate) and fix the glass plate set with:
1 clip right, 1 clip left and 1 clip at the bottom for Minigel and Minigel-Twin,
1 clip right, 1 clip left and 2 clips at the bottom for Multigel,
2 clips right, 2 clips left and 2 clips at the bottom for Multigel-Long,
2 clips right, 2 clips left and 2 Maxi-clips at the bottom for Maxigel.



Attention:

Acrylamide is a neurotoxin. Handle gels and gel solutions with care and wear rubber gloves.

5.2 Running Gel:

Minigel / Minigel-Twin:

About 6 ml of gel solution are needed if 1.0 mm spacers are used. Immediately after addition of TEMED and ammoniumpersulfate, pour the solution between the glass plates (up to 4 cm) and overlay it carefully with 0.2 ml of bidistilled water.

Multigel:

About 9 ml of gel solution are needed if 1.0 mm spacers are used. Immediately after addition of TEMED and ammoniumpersulfate, pour the solution between the glass plates (up to 5 - 5.5 cm) and overlay it carefully with 0.8 ml of bidistilled water.

Multigel-Long:

About 12 ml of gel solution are needed if 1.0 mm spacers are used. Immediately after addition of TEMED and ammoniumpersulfate, pour the solution between the glass plates (up to 9 - 9.5 cm) and overlay it carefully with 0.8 ml of bidistilled water.

Maxigel:

About 30 ml of gel solution are needed if 1.0 mm spacers are used. Immediately after addition of TEMED and ammoniumpersulfate, pour the solution between the glass plates (up to 16 cm from the bottom) and overlay it carefully with bidistilled water.

Polymerisation (visible by the formation of a sharp boundary between gel and overlay) takes about 20-40 minutes. Remove the water completely from the surface of the polymerised gel with a sheet of filter paper.

5.3 Stacking Gel

Minigel / Minigel-Twin:

About 2 ml of stacking gel solution is required.

Multigel and Multigel-Long::

About 2.5 to 3 ml of stacking gel solution is required.

Maxigel:

About 3.5 ml of stacking gel solution is required.

Insert the comb after pouring the solution between the glass plates. The polymerisation should take about 20 - 30 minutes.

5.4 Assembly

Remove the silicone rubber seals and combs, fill up the lower buffer reservoir with the running buffer and mount the plates onto the apparatus. Make shure that there are no air bubbles present at the bottom of the running gel. You may achieve this by tilting the plates when dipping them into the buffer. After fixing the glass plate sets with the clamps onto the body of the electrophoresis apparatus fill up the upper buffer reservoir with buffer and remove the comb carefully. Wash the slots with buffer.

5.5 Sample Application

Dissolve the sample in SDS-sample buffer and carefully load it into the slots of the stacking gel. If you are using samples precipitated with trichloroacetic acid, neutralise them first with Tris base solution.

As the 24 well comb for Multigel and Multigel-Long (Code-No. 010-204) is compatible with the multichannel pipet, multiple loading of samples is possible.

5.6 Electrophoresis

Mount the safety lid. Switch on the power supply e.g. Power Pack P20 (Code-No. 040-400) or Power Pack P25 (Code-No 040-800) from Biometra. Be aware that the plus pole (in red) is connected to the lower buffer reservoir.

The following conditions can be recommended for a gel with a 10% Running Gel and 1mm spacers:

Minigel / Minigel-Twin:

Stacking gel	10 mA
Running (Separation) gel	25 mA

Multigel and Multigel-Long:

Stacking gel 10 - 20 mA
Running (Separation) gel 25 - 35 mA

Maxigel:

Stacking gel 15 - 25 mA
Running (Separation) gel 50 - 60 mA

The values may vary with gel concentration.

Multigel, Multigel-Long and Maxigel:

A more homogeneous run with even sharper bands can be achieved by **water cooling**.



**Do not mix up the "in" and "out" plugs for the cooling water.
Max. flow rate (unpressurized) = 0.5 – 1 l/min**

Stop the electrophoresis when the bromphenol blue band has nearly reached the bottom of the running gel.

Switch off the Power Pack and open the safety lid after the plugs of the Multigel have been disconnected from the Power Pack.

5.7 Staining and Destaining

Slide the gel carefully from the glass plates into the Coomassie Brilliant Blue staining solution and stain it for 30-60 minutes with gentle agitation. Fixation with trichloroacetic acid is not necessary. Destain briefly with a solution of 45% ethanol, 10% acetic acid, 45% water and then in a solution of 7% acetic acid in water.

5.8 Cleaning



Use only mild non-abrasive detergents.



DO NOT use alcohol (e.g. methanol, ethanol) or organic solvents (e.g. acetone) on the electrophoresis unit.



DO NOT use chromosulfuric acid to clean the glass plates.



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

6.0 Solutions for SDS Polyacrylamide Gels used

6.1 Running Gel

Minigel and Minigel-Twin: (6 ml per gel)

Acrylamide conc. in %	7.5	10.0	12.5	15.0	17.5
30% acrylamide, 0.8% bisacrylamide stock solution in ml	1.5	2.0	2.5	3.0	3.5
1.88 M Tris/HCl pH 8.8 in ml	1.2	1.2	1.2	1.2	1.2
0.5% SDS in ml	1.2	1.2	1.2	1.2	1.2
dist. H ₂ O in ml	2.1	1.6	1.1	0.6	0.1
TEMED in μ l	5	5	5	5	5
ammonium persulphate sol., 10% in μ l	30	30	30	30	30

Multigel: (9 ml per gel)

Acrylamide conc. in %	7.5	10.0	12.5	15.0	17.5
30% acrylamide, 0.8% bisacrylamide stock solution in ml	2.25	3.0	3.75	4.5	5.25
1.88 M Tris/HCl pH 8.8 in ml	1.8	1.8	1.8	1.8	1.8
0.5% SDS in ml	1.8	1.8	1.8	1.8	1.8
dist. H ₂ O in ml	3.15	2.4	1.65	0.9	0.15
TEMED in μ l	8	8	8	8	8
ammonium persulphate sol., 10% in μ l	45	45	45	45	45

Multigel-Long: (12 ml per gel)

Acrylamide conc. in %	7.5	10.0	12.5	15.0	17.5
30% acrylamide, 0.8% bisacrylamide stock solution in ml	3.0	4.0	5.0	6.0	7.0
1.88 M Tris/HCl pH 8.8 in ml	2.4	2.4	2.4	2.4	2.4
0.5% SDS in ml	2.4	2.4	2.4	2.4	2.4
dist. H ₂ O in ml	4.2	3.2	2.2	1.2	0.2
TEMED in μ l	10	10	10	10	10
ammonium persulphate sol., 10% in μ l	60	60	60	60	60

Maxigel: (30 ml per gel)

Acrylamide conc. in %	7.5	10.0	12.5	15.0	17.5
30% acrylamide, 0.8% bisacrylamide stock solution in ml	7.5	10.0	12.5	15.0	17.5
1.88 M Tris/HCl pH 8.8 in ml	6.0	6.0	6.0	6.0	6.0
0.5% SDS in ml	6.0	6.0	6.0	6.0	6.0
dist. H ₂ O in ml	10.5	8.0	5.5	3.0	0.5
TEMED in μ l	25	25	25	25	25
ammonium persulphate sol., 10% in μ l	150	150	150	150	150



Attention:

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

6.2 Stacking Gel, 5%

Minigel and Minigel-Twin: (2 ml per gel)

0.33 ml	30% acrylamide, 0,8% bisacrylamide stock solution
0.4 ml	0.625 M Tris/HCl pH 6.8
0.4 ml	0.5% SDS
0.87 ml	dist. H ₂ O
2 µl	TEMED
10 µl	10% ammonium persulphate sol.

Multigel and Multigel-Long: (4 ml per gel)

0.66 ml	30% acrylamide, 0,8% bisacrylamide stock solution
0.8 ml	0.625 M Tris/HCl pH 6.8
0.8 ml	0.5% SDS
1,74 ml	dist. H ₂ O
4 µl	TEMED
20 µl	10% ammonium persulphate sol.

Maxigel: (6 ml per gel)

1.0 ml	30% acrylamide, 0,8% bisacrylamide stock solution
1.2 ml	0.625 M Tris/HCl pH 6.8
1.2 ml	0.5% SDS
2.6 ml	bidist. H ₂ O
6 µl	TEMED
30 µl	10% ammonium persulphate sol.



Attention:

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

6.3 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 β -mercaptoethanol
0.1 ml bromophenol blue (1% in ethanol)
2.4 ml dist. H₂O

Dilute the sample buffer 1 to 1 with the sample.

6.4 Running Buffer pH 8.3 (5 liter)

15.1 g Tris-Base
72.0 g glycine
5.0 g SDS

6.5 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
Stirr overnight; filtrate before use; store in dark bottle!

6.6 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

7.0 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.

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:** Clean all parts of the instrument from residues, and of biologically dangerous, chemical and radioactive contaminants. If the device 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.

8.0 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.

EU - Declaration of Conformity

Göttingen, March 2009

im Sinne der EG-Richtlinie über elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen 73/23/EWG.
following the EC directive about electrical equipment for use within certain limits of voltage 73/23/EEC.

Hiermit erklären wir, daß folgende **Slabgele**
*Herewith we declare that the following **Slabgel Systems***

Typen / types:	Minigel, Minigel-Twin, Multigel, Multigel-Long, Maxigel
Best.-Nr. / Order No.	010-000, 010-030, 010-040, 010-100, 010-130, 010-140, 010-200, 010-220, 010-230, 010-270, 010-300, 010-320, 010-330, 010-400, 010-430, 010-440

den grundlegenden Anforderungen der
corresponds to the basic requirements of

EG-Niederspannungsrichtlinie 73/23/EWG entsprechen.
EC low voltage directive 73/23/EEC.

Folgende harmonisierte Normen wurden angewandt:
The following harmonized standards have been used:

EN 61 010 - 1 (in Anlehnung / *corresponding to*)

EN 61 010 - 1/A2 (in Anlehnung / *corresponding to*)

Dr. Jürgen Otte
Quality Manager

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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e-mail: Service@biometra.com