Single and Dual Adjustable Slab Gel Kits (ASG Series, DASG Series)

expedeon

INDEX

ORDERING INFORMATION

CAT. #	# of Gels	Overall Dimensions W x D x H (cm)	Glass Plate Dimension Options W x L (cm)	Recommended Buffer Reservoir Volume (mls)
ASG-250 ASG-250-02	1	22 x 19 x 28	16.5 x 14.5 16.5 x 16 16.5 x 17 16.5 x 19 16.5 x 22 16.5 x 28	310-375 upper 150-350 lower
DASG-250 DASG-250-02	2	22 x 19 x 28	16.5 x 14.5 16.5 x 16 16.5 x 17 16.5 x 19 16.5 x 22 16.5 x 28	375-475 upper 150-350 lower
ASG-400 ASG-400-02	1	22 x 19 x 42	16.5 x 14.5 16.5 x 16 16.5 x 17 16.5 x 19 16.5 x 22 16.5 x 28 16.5 x 38.7	310-375 upper 150-350 lower
DASG-400 DASG-400-02	2	22 x 19 x 42	16.5 x 14.5 16.5 x 16 16.5 x 17 16.5 x 19 16.5 x 22 16.5 x 28 16.5 x 38.7	375-475 upper 150-350 lower

"Note: Variations in '-02' are CE versions with certified safety cover"

KIT CONTENTS

Dual Adjustable Vertical Systems (DASG- series)	Adjustable Vertical Systems (ASG- series)
Dual vertical electrophoresis cell with delrin rods, leveling base and bubble level	Single vertical electrophoresis cell with delrin rods, leveling base and bubble level
Safety covers and power leads	Safety covers and power leads
Leak proof silicone gasket on upper reservoir to which the glass plates are clamped	Leak proof silicone gasket on upper reservoir to which the glass plates are clamped
Platinum electrodes	Platinum electrodes
2 combs	1 comb
2 sets Gel Wrap® glass plates	1 set Gel Wrap® glass plates
2 sets of Gel Wrap® spacers	1 set of Gel Wrap® spacers
2 Gel Wrap® gaskets for gel casting	1 Gel Wrap® gasket for gel casting
2 wedge plate separators	1 wedge plate separator
White spring clamps (4x GPC-0001 & 12x GPC-0002)	White spring clamps (2x GPC-0001 & 6x GPC-0002)
Conversion plate for running one gel at a time	

INTRODUCTION

The Adjustable Slab Gel Systems offered by Expedeon are designed to meet a wide variety of applications. These systems are designed for separating and characterizing protein and can be adapted for short nucleic acid sequencing runs with the appropriate accessories. Depending on the model, these systems allow one or two gels to be run simultaneously under identical buffer conditions and also provides the flexibility of running gels with heights from 145mm to 387mm. Gel casting can be accomplished using our convenient and unique Gel Wrap® system, or by using our multiple gel casting chambers (see "Related products" section).

Other applications include; mobility shift assays, antibody super shift assays, Rnase protection assays, DNA footprinting, differential display, DNA paternity testing and forensic analysis.

SPECIFICATIONS

Constructions:	
Buffer chamber, lid	Acrylic
Electrodes	Platinumwire .012" diameter
Power cords	FR Urethane rated 7500VDC, 200mA, 65ºC
Guide Rods	Delrim
Combs	Teflon
Glass plates	Soda-lime float glass
Spacers	PVC
Clamps	Polypropylene, stainless steel
Safety Certification	EN61010-1-1993 (IEC1010-1)

INTRUCTIONS FOR USE

Adjustable Slab Gel Unit Preparation

A. Unit Set-up

1. Place Adjustable Slab Gel unit on a level work surface in an authorized work area. Attach each of the black guide rods to the flathead screws through the countersunk holes on the bottom of the base. Thread the screws into the black guide rods and hand tighten. Do not over tighten.
2. Slide the upper reservoir onto the guide rods. Be sure to unscrew the thumbscrews slightly so that the ends of the screws are not protruding into the guide rod channels.
3. Adjust the upper reservoir so that the facia and glass notches are level, using a notched plate as a guide. Tighten the two black thumbscrews to fix the height.
4. Level the unit by adjusting the four white nylon thumbscrews until the bubble is centered in the level. Be sure that all four of the screws are touching the bench.
5. Verify that the comb, spacer set and Gel Wrap® gasket are the same thickness by assembling without gel casting.

B. Adjustable-Height Safety Cover

The safety cover is shipped set at a height corresponding to the 160mm glass plates. To adjust the cover height:

1. Pull both white handles outward to release tabs.
2. Immediately push up on inner cover with index finger, to increase height, until tab reaches desired slot. Alternatively, invert both section of the adjustable height safety cover, pull both white handles outward to release tabs, allowing the inner section to slide to desired height.

Reminder: For proper safety cover operation, height of upper reservoir notch must align with the notch in the glass plates. Place a single notched glass plate (or short plate if using unnothced sets) on to feet in lower reservoir and adjust upper reservoir until glass and upper reservoir notch are even (see step 3 in Unit Set-up). Secure black

thumbscrews. Test fit safety cover before using system.

Preparation/Cleaning of Glass Plates

Hand wash both plates with a high quality lab detergent followed by a complete rinsing with dH2O. Air dry or use a lint-free tissue. Spray/wipe the chosen inner surfaces of the plate set with 95% ethanol and dry with lint-free tissue.

Gel Casting Using Gel Wrap® Gasket Casting method

1. Start by holding the rectangular back plate with the rounded bottom corners and start applying the gasket around one side of the glass plate. Note: one side of the "U" shaped gasket is flat, and the other side has tubing that will act as a seal around the spacers.

2. When applying the gasket over the rounded corners of the back glass plate, make sure the notches on the gasket align with the rounded corners of the glass plate. Once the gasket is pushed over the bottom edge and corners, work it down the remaining side.

3. Place the gasketed plate on the lab bench with the tubing side up, and extend the bottom of the plate over the edge of the bench, approximately ¾ of an inch. Place the spacers along side the inside edges of the gasket. Be sure the rounded corner end of each spacer is facing the outside bottom of the plate, following the radius of the glass.

4. Place the notched plate on top of the bottom assembly, starting from the bottom edge and gently easing the plate down. Verify the gasket is smooth around the edges and then clamp along the bottom.

5. Lift the assembly and stand it on the base of the clamps. For leveling, push glass plate assembly down until it stops against clamp body. Clamp the sides of the assembly with additional casting clamps on either side. As each clamp is attached, be sure the gasket is aligned between the plates forming a seal.

6. Apply PAGE or agarose solution to gel plate sandwich using a syringe or pipette. If using a stacking gel, pour desired height of running gel, then overlay a small amount of dH2O or 0.1% SDS solution to top of gel. After polymerization, rinse with buffer, add stacking gel solution and insert comb. For regular, unit percentage gels, add polyacrylamide solution to correct height, and insert comb. Allow gel to set, usually 20 minutes. Extra gel solution in pipette or syringe can be monitored to test polymerization of gel mix.

7. Disassembly. Hold the clamped plate assembly with one hand. Remove the gasket by starting at one of the top ends and pulling up and out on the gasket until it releases from the plate, up to the bottom of each of the white clamps. When each clamp is reached DO NOT remove it, instead feed the gasket down through the clamp body and repeat pulling up and out. Continue feeding until the gasket is fully detached. If gel, is not to be used immediately, wrap entire plate sandwich with plastic wrap tightly to seal and store at 4°C for up to a month.

Running the Gel

1. Attach plate set(s) to unit with smaller or notched plate facing towards the upper buffer reservoir. If using a pre-cast gel stored at 4°C, allow to warm to room temperature. Use white clamps with mouth open (cat. # GPC-0001) to attach plate set to unit, clamping each side to the sandwich.

   Optional Cooling Plate Instructions: If using optional aluminum plate during electrophoresis place behind the unit. Secure in place with 2 each GPC0001 white clamps (ordered separately).

2. Pour freshly prepared buffer in upper and lower chamber. Using a pipette or syringe, thoroughly flush out the wells in the glass plate sandwich with buffer from the upper chamber. Boil or heat samples and then place immediately on ice. Load samples. If outer lanes do not contain sample, it is recommended that you run standards and/or fill outer lanes with loading buffer to reduce smiling and wrap-around effects.

3. Attach safety cover.

4. Connect the leads to the power supply, matching the color-coded red to red and black to black. See Section for recommended power conditions. Begin separation by electrophoresis.

Removing the Gel

1. Turn the power supply off and disconnect the leads from the power supply. Remove the safety cover from the unit, by placing thumbs on white posts next to red & black connectors, then pushing down while pulling up with fingers under lid. DO NOT pull on power cords.

2. Drain upper reservoir using a pipette or syringe. Detach side clamps and remove gel sandwich. Carefully separate, making sure that the gel remains attached to one plate. Stain and fix according to your preferred method. Dispose of buffer according to your institutions safety requirements.

Maximum Well/Comb Volumes
NOTE: To calculate sample well volume expressed in millimeters (mm) of height divide maximum volume by tooth depth.

COMB OPTIONS, 16.5cm wide material: PTFE, overall length: 13.1cm					
Cat #	Tooth Depth (mm)	# of Teeth	Thickness of Teeth (mm)	Tooth Width (mm)	Recommened Max. Sample Vol./Well (µl)**
VGC-0720	17.7	20	0.75	4.2	42
VGC-0730	17.7	30	0.75	2.8	28
VGC-1020	19.1	20	1.0	4.2	56
VGC-1030	17.7	30	1.0	2.8	37
VGC-1520	17.7	20	1.5	4.2	83
VGC-1530	17.7	30	1.5	2.8	56

** Maximum loading volume is calculated by taking 75% of the total tooth volume.

RUNNING CONDITIONS

Recommended Power

Precise electrophoresis conditions will vary according to the number and type of gels used, buffer conditions employed, power input, and the general goal of the experiment. Refer to the reference section for in depth discussions on practical and theoretical approaches to protein gel electrophoresis.
Using standard SDS-PAGE buffer systems apply 1-10 VDC/cm of gel. For sequencing applications use 50 VDC/cm. If running two gels in the Dual Units, keep the volts the same but double the mA. It is also true that if the thickness of gel increases, increase the mA proportionally.

At constant voltage, the proteins will migrate at a constant rate during electrophoresis with adequate heating appropriate for denaturing gels. Increasing the voltage/mA (for a single gel thickness and percentage) will speed mobility but increase the risk of overheating.

The sample migration rate can be increased by raising the input power. This can be done on systems which employ “active” temperature control such as Dual Slab Gel Units and Dual MiniVertical Gel Units. The joule heating generated by the higher input power is offset by the cooling effect of the water jacket between the gels. Exact conditions should be determined empirically but could be increased at least in the 20% range.

Recommended Buffers and Reagents

Pre-mixed acrylamide stock solutions are the method of choice. Use according to manufacturer's instructions.

Typical 'scratch' recipe for a 4% acrylamide gel:
10 mls 40% acrylamide
6.6 mls 2% Bis-acrylamide stock
5 mls 10X TBE
78.4 mls dH20
750ul 10% APS
50ul TEMED

1. Make up 0.5X TBE buffer
2. After gel apparatus is set-up and ready for the gel to be poured, add 750ul fresh 10% APS solution to the acrylamide solution.
3. Add 5 to 10 ul TEMED and using a 10 to 25ml pipette, quickly "pour" the gel.
4. Allow the gel to polymerize at least 60 minutes.
5. Remove the comb after polymerization and wash out wells with 0.5X TBE (acrylamide will seep into the wells).
6. Fill upper and lower chambers with 0.5X TBE
7. Pre-electrophorese gel, if needed, 20-30 minutes.
8. Load wells with samples.
9. Monitor migration with dye markers.

Recommended Buffers and Reagents continued

Agarose
TBE (1X solution):
0.089M Tris base
0.89M Boric acid
0.002M EDTA
pH 8.3

Page/Agarose Slab
TAE (1X):
0.04M Tris-acetate
0.001M EDTA
pH 8.0

Protein Denaturing
TG-SDS (1X):
0.025M Tris base
0.192M Glycine
0.1%(w/v) SDS
pH3

Denaturing/Non-Denaturing/Nylon Blotting
TT (Tris-Taurine((1X):
0.1M Tris base
0.1M Tricine

TT-SDS (1X):
0.1M Tris base
0.1M Tricine
0.1%(w/) SDS

DNA Sequencing
TTE (Tris/Taurine/EDTA)(1X):
1.78M Tris
0.57M Taurine
0.01M EDTA Na2-2$H_2$0

References

- Hames, B.D., Rickwoood, D. (ed.) (1990). Gel Electrophoresis of Proteins. A Practical Approach. 2nd edn. IRL Press,Oxford. Ch.1 & 3.
- Sambrook, J., Fritsch, E.F., Maniatis, T. (1989). Molecular Cloning. A Laboratory Manual. 2nd edn. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York. 18.47-18.61.
- Ausubel, F.M., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (ed) (1993). Current Protocols in Molecular Biology. Vol. 2, Greene Publishing Associates, Inc. and John Wiley & Sons, Inc., Ch.10.

MAINTENANCE OF EQUIPMENT

Care and Handling

The plastic components of the Adjustable Slab Gel units are fabricated from acrylic, delrin and polycarbonate. Electrodes and connectors are made from pure platinum, stainless steel, and chrome plated brass. As with any laboratory instrument, adequate care ensures consistent and reliable performance.

After each use, rinse buffer chamber, glass plate, spacers and combs with de-ionized water. Wipe dry with a soft cloth or paper towel, or allow to air dry. Whenever necessary, all components may be washed gently with water and a non-abrasive detergent, and rinsed and dried as above. Never use abrasive cleaners, glass cleaning sprays or scouring pads to clean the components, as these will damage the unit and components.

Additional precautions:

- Do not autoclave or dry-heat sterilize the apparatus or components.
- Do not expose the apparatus or components to phenol, acetone, benzene, halogenated hydrocarbon solvents or undiluted alcohols.
- Avoid prolonged exposure of the apparatus or components to UV light.
- Do NOT treat with diethylpyrocarbonate (DEPC)-treated water for extended periods at 37°C. A brief rinse with DEPC-water is sufficient after a thorough wash.

Maintenance

The following inspection and maintenance procedures will help maintain the safety and reliable performance of the Adjustable Slab Gel systems. Replacement parts can be ordered by contacting your local distributor.

- Banana plugs and power cords should be inspected regularly. If the banana plugs become loose or do not feel friction tight replace the plugs or power cords.
- Should power cord assemblies (connectors, wire or shrouds) show any signs of wear or damage (e.g. cracks, nicks, abrasions, or melted insulation), replace them immediately.
- The platinum wire is secured to the banana jack by compression between a stainless washer and the jack nut. The nut/washer interface should be tight and free of corrosion.

Related Products

Standard Spacers (PVC)

Cat. #	Spacer dimmensions
VGS-0712	0.75mm x 145mm
VGS-0716	0.75mm x 160mm
VGS-0717	0.75mm x 170mm
VGS-0719	0.75mm x 190mm
VGS-0720	0.75mm x 220mm
VGS-0725	0.75mm x 280mm
VGS-0740	0.75mm x 387mm
VGS-1012	1.0mm x 145mm
VGS-1016	1.0mm x 160mm
VGS-1017	1.0mm x 170mm
VGS-1019	1.0mm x 190mm
VGS-1020	1.0mm x 220mm
VGS-1025	1.0mm x 280mm
VGS-1040	1.0mm x 387mm
VGS-1512	1.5mm x 145mm
VGS-1516	1.5mm x 160mm
VGS-1517	1.5mm x 170mm
VGS-1519	1.5mm x 190mm
VGS-1520	1.5mm x 220mm
VGS-1525	1.5mm x 280mm
VGS-1540	1.5mm x 387mm

Gel Wrap Gasket:

Cat.#	Gasket thickness x Plate size
VGE-0712	0.75mm thick x 145mm
VGE-0716	0.75mm thick x 160mm
VGE-0717	0.75mm thick x 170mm
VGE-0719	0.75mm thick x 190mm
VGE-0720	0.75mm thick x 220mm
VGE-0725	0.75mm thick x 280mm
VGE-0740	0.75mm thick x 387mm
VGE-1012	1.0mm thick x 145mm
VGE-1016	1.0mm thick x 160mm
VGE-1017	1.0mm thick x 170mm
VGE-1019	1.0mm thick x 190mm
VGE-1020	1.0mm thick x 220mm
VGE-1025	1.0mm thick x 280mm
VGE-1040	1.0mm thick x 387mm
VGE-1512	1.5mm thick x 145mm
VGE-1516	1.5mm thick x 160mm
VGE-1517	1.5mm thick x 170mm
VGE-1519	1.5mm thick x 190mm
VGE-1520	1.5mm thick x 220mm
VGE-1525	1.5mm thick x 280mm
VGE-1540	1.5mm thick x 387mm

Blotting Systems:

* EBU-102: : Large Blotting System, 3-place. Includes 1 cassette. 22 x 16 cm.
* EBC-102: : Additional Blotting Cassette for EBU-102

Semi-Dry Systems:

* EBU-4000: Semi-Dry Blotting System. Transfer area of 20 x 20 cm

Multi-Caster Chamber:

* GCC-404: Multi-Caster Chamber. Fits four gels 16.5cm (w) and heights up to 22cm. Glass plate sets, combs and spacers not included. (Peristaltic Pump "MPP-100" recommended to work)

Peristaltic Pumps:

* MPP-100: Peristaltic pump, 110V.
* MPP-100-220: Peristaltic pump, 220V.

Power Supplies:

* EPS-300X: Power Supply, CE, 1-300V, 1-500mA
* EPS-3000P-1: High Voltage Programmable Power Supply, CE, 3000V, 300mA, 300W. 100 - 125 VAC, 50/60 Hz
* EPS-3000P-2: High Voltage Programmable Power Supply, CE, 3000V, 300mA, 300W. 210 - 250 VAC, 50/60 Hz

Gel Wrap Glass Plate Sets, Notched. Back plate with rounded corners

Cat. #	Glass Plate dimensions (W x H)
NGP-125NR	16.5cm x 145mm
NGP-160NR	16.5cm x 160mm
NGP-170NR	16.5cm x 170mm
NGP-190NR	16.5cm x 190mm
NGP-200NR	16.5cm x 220mm
NGP-250NR	16.5cm x 280mm
NGP-400NR	16.5cm x 387mm

Standard Glass Plate Sets, Notched

Cat #	Glass Plate dimensions (W x H)
NGP-125N	16.5cm x 145mm
NGP-160N	16.5cm x 160mm
NGP-170N	16.5cm x 170mm
NGP-190N	16.5cm x 190mm
NGP-200N	16.5cm x 220mm
NGP-250N	16.5cm x 280mm

Aluminum Heat Dispersion Plates

Cat. #	Compatible Plate
CPA165-200	NGP-200
CPA165-250	NGP-250
CPA165-400	NGP-400

Additional Vertical Gel Accessories

Bar Clamp

Cat. #	Item
GPC-1650	Bar clamp for 16.5cm wide units

White Clamps

Cat. #	Item
GPC-0004	Large capacity, multi-task white clamp
GPC-0002	Casting clamp, jaws closed in resting position
GPC-0001	Large white clamp, jaws slightly open in resting position

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