Instruction Manual

OmniPAGE Electrophoresis Systems

CVS10D, CVS10DSYS, CVS10PRE
VS10D, VS10DSYS, VS10PRE, VS10DCAST
VS20D, VS20DSYS, VS20DCAST,
VS10WD, VS10WDSYS
VS30D, VS30DSYS, VS30DCAST

Contents:-

Page

SAFETY PRECAUTION

WHEN USED CORRECTLY, THESE UNITS POSE NO HEALTH RISK.
HOWEVER, THESE UNITS CAN DELIVER DANGEROUS LEVELS OF ELECTRICITY AND ARE TO BE OPERATED ONLY BY QUALIFIED PERSONNEL FOLLOWING THE GUIDELINES LAID OUT IN THIS INSTRUCTION MANUAL.

ANYONE INTENDING TO USE THIS EQUIPMENT SHOULD READ THE COMPLETE MANUAL THOROUGHLY.

THE UNIT MUST NEVER BE USED WITHOUT THE SAFETY LID CORRECTLY IN POSITION.
THE UNIT SHOULD NOT BE USED IF THERE IS ANY SIGN OF DAMAGE TO THE EXTERNAL TANK OR LID.
ACRYLAMIDE IS A POWERFUL NEUROTOXIN IN SOLUTION FORM.
POLYMERIZED GELS CAN CONTAIN SOME UNPOLYMERIZED SOLUTION AND PROTECTIVE GLOVES AND CLOTHING MUST BE WORN.
THESE UNITS COMPLY WITH THE STATUTORY CE SAFETY DIRECTIVES:
73/23/EEC: LOW VOLTAGE DIRECTIVE: IEC 1010-1:1990 plus AMENDMENT 1:1992
EN 61010-1:1993/BS EN 61010-1:1993

PACKING LISTS:

CVS10D, CVS10DSYS, CVS10PRE,

VS10D, VS10DSYS, VS10PRE, VS10DCAST

Units include tank, lid, internal module and electrodes and include the following accessories:-

	Glass Plates	Combs	Casting base	Cooling Pack	Cables
VS10D **CVS10D**	VS10NG ï Notched, Pk/2 VS10PGS1 ï Plain with bonded 1mm spacers, Pk/2 VS10-DP ï Dummy Plate	2 of VS10-12-1 1mm thick, 12 sample	**SCREWS** VS10-SCREW x 4	VS10ICB	CSL-CAB
VS10DSYS **CVS10DSYS**	VS10NG ï Notched, Pk/2 VS10PGS1 ï Plain with bonded 1mm spacers, Pk/2 VS10-DP ï Dummy Plate	2 of VS10-12-1 1mm thick, 12 sample	VS10DCAST VS10DCASTM ï Mat **SCREWS** VS10-SCREW x 4	VS10ICB	CSL-CAB
VS10PRE **CVS10PRE**	VS10-DP ï Dummy Plate		**SCREWS** VS10-SCREW x 4	VS10ICB	CSL-CAB
VS10DCAST			VS10DCAST VS10DCASTM - Mat		

The packing lists should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received. Please contact your supplier if there are any problems or missing items.

VS20D, VS20DSYS, VS20DCAST

Units include tank, lid, internal module and electrodes and include the following accessories:-

	Glass Plates	Combs	Casting base	Cooling Pack	Cables
VS20D	VS20NG - Notched, Pk/2 VS20PGS1 ï Plain with bonded 1mm spacers, Pk/2	2 of VS20-24-1 1mm thick, 24 sample		VS20ICB	CSL-CAB

	VS20-DP ï Dummy Plate				
VS20DSYS	VS20NG - Notched, Pk/2 VS20PGS1 ï Plain with bonded 1mm spacers, Pk/2 VS20-DP ï Dummy Plate	2 of VS20-24-1 1mm thick, 24 sample	VS20DCAST VS20DCASTM - Mat	VS20ICB	CSL-CAB
VS20-DGGE	VS20NG - Notched, Pk/2 VS20PGS1 ï Plain with bonded 1mm spacers, Pk/2 VS20-DP ï Dummy Plate	2 of VS20-24-1 1mm thick, 24 sample	VS20DCAST VS20DCASTM - Mat	VS20ICB **Heater Control Unit:** VS20ECON	CSL-CAB **Gradient Mixer:** CSL-GM 100
VS20DCAST			VS20DCAST VS20DCASTM - Mat		

The packing lists should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received. Please contact your supplier if there are any problems or missing items.

VS10WD, VS10WDSYS

Units include tank, lid, internal module and electrodes and include the following accessories:-

	Glass Plates	**Combs**	**Casting base**	**Cooling Pack**	**Cables**
VS10WD	VS10WNG - Notched, Pk/2 VS10WPGS1 ï Plain with bonded 1mm spacers, Pk/2 VS10W-DP ï Dummy Plate	2 of VS20-24-1 1mm thick, 24 sample		VS20ICB	CSL-CAB
VS10WDSYS	VS10WNG - Notched, Pk/2 VS10WPGS1 ï Plain with bonded 1mm spacers, Pk/2 VS10W-DP ï Dummy Plate	2 of VS20-24-1 1mm thick, 24 sample	VS20DCAST VS20DCASTM - Mat	VS20ICB	CSL-CAB
VS20DCAST			VS20DCAST VS20DCASTM - Mat		

The packing lists should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received. Please contact your supplier if there are any problems or missing items.

VS30D, VS30DSYS, VS30DCAST

Units include tank, lid, internal module and electrodes and include the following accessories:-

	Glass Plates	Combs	Casting base	Cooling Pack	Cables
VS30D	VS30NG - Notched, Pk/2 VS30PGS1.5 ï Plain with bonded 1.5mm spacers, Pk/2 VS30-DP ï Dummy Plate	2 of VS30-1-1.5 1.5mm thick, 1 sample		VS30ICB	CSL-CAB
VS30DSYS	VS30NG - Notched, Pk/2 VS30PGS1.5 ï Plain with bonded 1.5mm spacers, Pk/2 VS30-DP ï Dummy Plate	2 of VS30-1-1.5 1.5mm thick, 1 sample	VS30DCAST VS30DCASTM - Mat	VS30ICB	CSL-CAB
VS30DCAST			VS30DCAST VS30DCASTM - Mat		

The packing lists should be referred to as soon as the units are received to ensure that all components have been included. The unit should be checked for damage when received. Please contact your supplier if there are any problems or missing items.

Care and Maintenance:-

Cleaning omniPAGE Units

Units are best cleaned using warm water and a mild detergent. **Water at temperatures above 60^0 C can cause damage to the unit and components.**

The tank should be thoroughly rinsed with warm water or distilled water to prevent build up of salts but care should be taken not to damage the enclosed electrode and vigorous cleaning is not necessary or advised.

Air drying is preferably before use.

The units should only be cleaned with the following:-

Warm water with a mild concentration of soap or other mild detergent.

Compatible detergents include dishwashing liquid, Hexane and Aliphatic hydrocarbons

The units should not be left to in detergents for more than 30 minutes.

The units should never come into contact with the following cleaning agents, these will cause irreversible and accumulative damage:-

Acetone, Phenol, Chloroform, Carbon tetrachloride, Methanol, Ethanol, Isopropyl alcohol

Alkalis.

RNase Decontamination

This can be performed using the following protocol:-

Clean the units with a mild detergent as described above.

Wash with 3% hydrogen peroxide (H2O2) for 10 minutes.

Rinsed with 0.1% DEPC- (diethyl pyrocarbonate) treated distilled water,

Caution: DEPC is a suspected carcinogen. Always take the necessary precautions when using. RNaseZAPÊ (Ambion) can also be used. Please consult the instructions for use with acrylic gel tanks.

Usage Guidance and restrictions:

ÅMaximum altitude 2,000m.

ÅTemperature range between 4°C and 65°C.

ÅMaximum relative humidity 80% for temperatures up to 31^{O}C decreasing linearly to 50% relative humidity at 40^{O}C.

ÅNot for outdoor Use.

This apparatus is rated POLLUTION DEGREE 2 in accordance with IEC 664.

POLLUTION DEGREE 2, states that: ñNormally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expectedò.

Setting up the omniPAGE Gel Tanks:-

Instructions for fitting Electrode Cables.

1. Note the position of the lid on the unit. This shows the correct polarity and the correct orientation of the cables, black is negative and red positive.
2. Remove the lid from the unit. Note if the lid is not removed, fitting the cables may result in un-tightening of the gold plug and damage to the electrode.
3. Screw the cables into the tapped holes as fully as possible so that there is no gap between the lid and the leading edge of the cable fitting.
4. Refit the lid.

The unit is now ready to be used.

Vertical Gel Casting Using the omniPAGE Gel Casting System:-

See page 12 for diagrams detailing the Mini vertical gel casting procedure.

1. Clean a set of glass plates for each gel first with distilled water and then with 70 % ethanol. One set of glass plates constitutes one notched glass plate and one plain glass plate with bonded spacers. When using a triple glass plate sandwich, two notched glass plates are required, one set of free spacers and a set of plain glass plates with bonded spacers. The plain glass plate is positioned outermost, then a notched glass plate, free spacers and second notched glass plate. Alternatively, accessory notch glass plates with bonded spacers are available. **All glass plates, modules and casting base accessories must be completely dry during set – up. Wet components are more likely to miss-align and cause leaks.**
2. Assemble the glass plates so that the bottom of the glass plates and the spacers are perfectly aligned. For triple plate sandwiches, the free spacers need to be perfectly aligned which is best performed using a small spacer or comb to push the spacers apart. Notched glass plates with bonded spacers do not need manual alignment. **NOTE: The glass plates with bonded spacers have an arrow in the top of the spacers which are slightly longer than the glass plate to indicate the top.**
3. The Slab Gel Insert contains pressure bars which impart even pressure onto the glass plates and allow even screw pressure transfer onto the sealing edge of the glass plate, ensuring complete sealing. Ensure that the pressure bars are adequately open for the thickness of spacer used. The bar can be opened by loosening the screws or by sliding the clamps. When using a triple glass plate sandwich, the pressure bars will need to be in the completely open position.
4. Position the Slab Gel Insert on a flat surface. **Do not at this stage insert the Slab Gel Insert into the casting base.**
5. Insert the glass plates into the Slab Gel Insert between the pressure bar and the blue gasket and fully tighten the pressure bar screws in the order top then bottom. Fully tighten the screw for the Mini vertical and the screws sequentially and in an even manner for the maxi vertical in the order middle two, top then bottom, making sure not to wobble the unit. When using the Slide Clamp Mini version, simply slide both gates outwards until fully tightened. When only one gel is being run, the dummy plate must be used in the second position and fully tightened. **At this stage, check that the bottom edges of the spacers and glass plates are perfectly aligned.**

6. Position the Slab Gel Insert in the casting base such that the Cam pins have handles pointing downwards and are located in the insert holes. The top of the GRM may need to be pushed down very slightly to locate the cam pins.

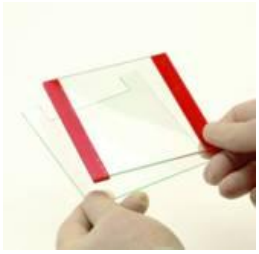
With the cam pin handles facing directly downwards, turn the cam pins fully through 180^0 or until the insert has tightened onto the silicone mat. **It is best to turn the cams in opposite directions to each other. Do not overturn as this will cause the glass plates to push upwards and the assembly will be more likely to leak. The unit is now ready for gel preparation and pouring**

Always reverse the silicone mat after casting to avoid indentations from persisting. Never leave the casting up-stand with glass plates tightened into the casting base for long periods of time as this will also cause indentations in the silicone mat.

The slide clamp version CVS10 also includes screws. This system can be used either with the slide clamps or screws as preferred by the user. For those that prefer to use the screws rather than clamps, the screws can be simply inserted into the screw holes. The clamps can be removed by placing each clamp in the fully open position and gently bending the clamp upwards from the slanted end. The holding pin will then slowly release and the clamp can be removed.

VERTICAL GEL CASTING.

1) Put together bonded spacer plain glass plate with notched plate

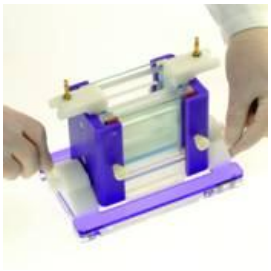


2) Insert **inside** pressure bar with notched plate innermost touching the gasket and module on a flat surface **away from the casting base**

A) SCREW VERSION OPTION

3A) Fully tighten screws ensuring not to wobble unit

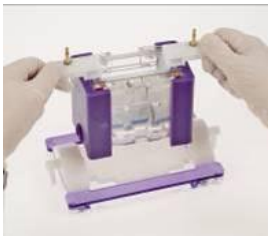
4A) Insert into casting base. Push the cams into the holes in the insert. Turn cams about 90^0 or until tight. Do not over tighten



B) SLIDING CLAMP VERSION OPTION

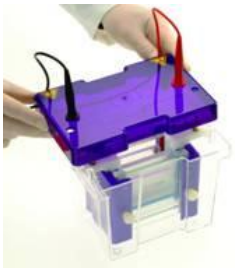
3B) Fully Slide Clamps tight ensuring not to wobble unit

4B) Insert into casting base. Push the cams into the holes in the insert, turn cams about 90^0 or until tight. Do not over tighten



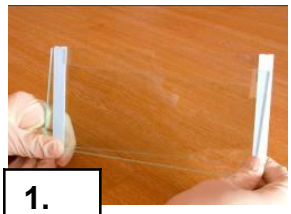
5) Pour resolving gel and allow to set. Then stacking gel solution and insert comb

6) Once set, transfer to tank and fill inner and outer chambers with buffer



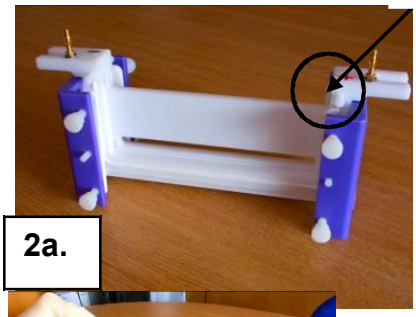
VERTICAL GEL CASTING WITH THE RE-ENGINEERED VS10W

1. Put together the bonded spacer plain glass plate with the notched glass plate facing innermost to form a gel cassette.

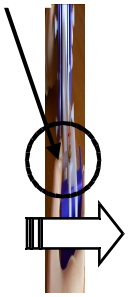


1.

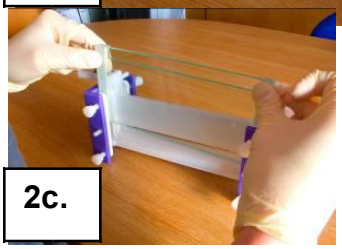
2. Push back the glass plate stops into the gel running module (**2a. & 2b.**). This will allow the gel cassette to be inserted from the top of the gel running module, which should be placed on a flat bench surface (**2c.**). Tighten the screws to secure the gel cassette in position, and repeat steps 1 & 2 on the other side with the remaining gel cassette.



2a.

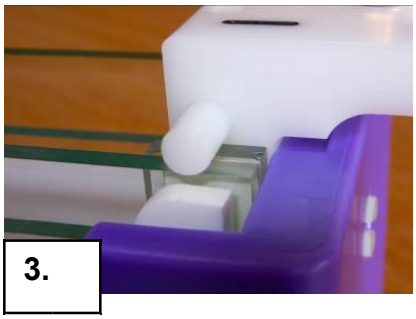


2b.



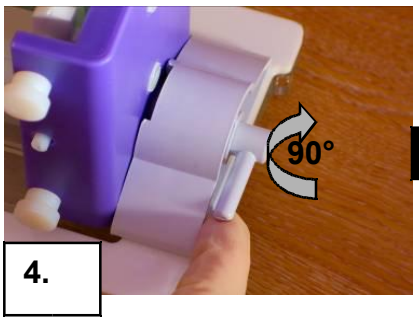
2c.

3. Once the gel cassettes are secured in an upright orientation flush with the gel running module, the glass plate stops should be pushed through the gel running module so that they are positioned directly above both glass plates comprising each gel cassette.

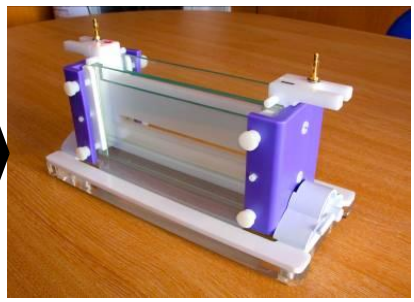


3.

4. Place the gel running module containing the gel cassettes onto the casting base. Push the cams into the holes in the insert, and - with the cams pointing downwards into the bench - turn them through 90° or until they become tight.



4.



Do not over tighten.

Gel Preparation:-

5. Follow steps 5 and 6 as per page 12 of **VERTICAL GEL CASTING.**

1. It is always advisable to work using stock solutions which allow added convenience and save time when it comes to gel pouring. Pages 17 and 18 list stock solutions for SDS PAGE gels which should be pre-made beforehand. For native gel formulae and running conditions, please consult a laboratory manual. The protocol below is given for use of the standard stock solutions advised. This should be adjusted if you are using different stock solutions or gel formulas.

2. Table 1 below shows the total volume of gel solution required. In subsequent tables, amounts of gel and solutions are given for two 1mm thick gels so adjustments are needed for when running single or more than two gels and for 0.75, 1.5 or 2mm thick spacers.

Table 1.

omniPAGE Mini – VS10D, VS10DSYS CVS10D, CVS10DSYS		**omniPAGE Maxi – VS20D, VS20DSYS VS10WD, VS10WDSYS**	
	Total Gel volume for a 1mm thick gel.		Total Gel volume for a 1mm thick gel.
For different thicknesses of gel, multiple the below amounts by the spacer thickness. * multiply by 1.5 for VS30 gels			
Single ï one gel, one dummy plate	7.5ml	Single ï one gel, one dummy plate	VS20 35ml* VS10W 17.5ml
Double ï two gels	15ml	Double ï two gels	VS20 70ml* VS10W 35ml
Using a Triple Plate sandwich ï four gels	30ml	Using a Triple Plate sandwich ï four gels	VS20 140ml* VS10W 70ml

Gel Selection:-

Care should be taken when selecting the pore size of the gel to be used.

The pore size or % of gel determines the resolving ability given different sizes of protein.

See Table 2 below which details which percentage of gel to use to separate the sizes of proteins indicated.

Table 2.

Acrylamide Percentage	Separating Resolution
5 %	60 - 220 KD
7.5 %	30 - 120 KD

10 %	20 - 75 KD
12%	17 ï 65 KD
15 %	15 -45 KD
17.5%	12 ï 30 KD

3. Prepare gel solutions as per tables below. These give the volumes of solutions from the standard stock solutions. These should be gently mixed avoiding generation of bubbles which will inhibit polymerization by removing free radicals.

Table 3: Preparation of the separating gel solution for two 10 x 10cm (C)VS10D gels using 1 mm spacers.

Solution	**5 %**	**7.5%**	**10 %**	**12%**	**15 %**	**17.5%**
Distilled Water	8.7ml	7.5ml	6.3ml	5.25ml	3.75ml	2.5ml
30 % Stock Acrylamide Solution	2.5ml	3.75ml	5ml	6ml	7.5ml	8.75ml
4 X Resolving Tris Solution	3.75ml	3.75ml	3.75ml	3.75ml	3.75ml	3.75ml
10 % Ammonium Persulphate	150µl	150µl	150µl	150µl	150µl	150µl

Table 4: Preparation of the separating gel solution for two 20 x 20cm VS20D gels using 1 mm spacers. Divide by two for VS10W gels. Multiply by 1.5 for VS30 gels

Solution	**5 %**	**7.5%**	**10 %**	**12%**	**15 %**	**17.5%**
Distilled Water	41ml	35.25ml	29.6ml	24.7ml	17.6ml	11.7ml
30 % Stock Acrylamide Solution	11.7ml	17.6ml	23.5ml	28.2ml	35.25ml	41.1ml
4 X Resolving Tris Solution	17.6ml	17.6ml	17.6ml	17.6ml	17.6ml	17.6ml
10 % Ammonium Persulphate	700µl	700µl	700µl	700µl	700µl	700µl

Gel Pouring:-

For gels with stacking layers:-

4. Insert the comb into the glass plates and mark a point on the glass plates 1cm below where the comb teeth finish. This indicates where to add the resolving gel to.

5. Add 15µl of TEMED to the resolving gel solution for (C)VS10D sized gels, 35 µl for VS10W, 70µl for VS20D and 105 µl for VS30D gels and mix well but avoid generating air bubbles.

6. Fill the glass plates again avoiding generating any air bubbles. Filling must be performed quickly before the TEMED causes the gel to become too viscous.

7. Overlay the gel extremely carefully with 1 ml of Isobutanol, Isopropanol or distilled water. When using distilled water extra care must be taken to ensure there is no mixing with the gel solution.

8. Let the resolving gel polymerize. Usually this takes around 15 minutes but this can vary due to the freshness of the reagents used. If polymerization is taken a lot longer than this, use fresher stock solutions or add more APS and TEMED.

9. Prepare the stacking gel using Table 5 below as a guide. Again stock solutions are given on pages 17 and 18.

Table 5.

Solution	**(C)VS10D**	**VS10W**	**VS20D**	**VS30D**
Distilled Water	4.2ml	8.4ml	16.8ml	25.2ml
30 % Stock Acrylamide Solution	0.65ml	1.3ml	2.6ml	3.9ml
4 X Stacking Gel Tris Solution	1.6ml	3.2ml	6.4ml	9.6ml
10 % Ammonium Persulphate	67µl	134 µl		268µl

10. Carefully mix the stacking gel solution, avoiding generating air bubbles.

11. Pour off the overlay liquid and rinse the gel with distilled water.

12. Add 6.7µl of TEMED to the stacking gel solution for VS10 gels. For VS10W gels add 13.4 µl, for VS20 gels add 26.8µl and 40.2 µl for VS30 gels. Mix well. Use a Pasteur pipette to fill the glass plates up to the top with stacking gel solution.

13. Carefully insert the comb making sure that no air bubbles get trapped under the ends of the comb teeth as these will inhibit sample progression.

14. Allow the stacking gel polymerize for 30 minutes.

For gels without stacking layers:-

4. Add 15µl of TEMED to the resolving gel solution for (C)VS10D sized gels, 35 µl for VS10W, 70µl for VS20D and 105 µl for VS30 gels and mix well but avoid generating air bubbles.

5. Fill the glass plates again avoiding generating any air bubbles. Filling must be performed quickly before the TEMED causes the gel to become too viscous.

6. Carefully insert the comb making sure that no air bubbles get trapped under the ends of the comb teeth as these will inhibit sample progression.

7. Let the gel polymerize. Usually this takes around 15 minutes but this can vary due to the freshness of the reagents used. If polymerization is taken a lot longer than this, use fresher stock solutions or add more APS and TEMED.

Preparation of denatured protein samples for loading:

The instructions given below are for denatured samples. For Native samples, please consult a laboratory handbook.

1. Prepare the protein samples for loading. The volume of sample depends on the capacity of the wells (See Comb specifications pages 22 and 23).

2. Using a 0.5 ml micro-centrifuge tube or other convenient receptacle, combine the protein sample and 4 X sample buffer. It is always advisable to use protein markers in one of the end lanes to indicate sizes of bands. These should be prepared according to the manufacturers instructions.

3. Heat the samples in a water bath or heating block for 2 minutes to denature the samples.

4. Centrifuge the samples in a micro-centrifuge for 20 seconds at 12,000 rpm. The protein samples are now ready to load.

Loading the samples:

1. If desired, fit the cooling pack(s) into the end of the tank. These should be pre-frozen and fitted with the longest side positioned sideways with the end(s) of the tank and pressed into the recess. Or these can be fitted down the front of the tank.

   NEVER FIT THESE UNDERNEATH THE MODULE IN THE BOTTOM OF THE TANK AS THIS WILL PREVENT THE FLOW OF CURRENT THROUGH THE GEL AND CAUSE SLOW RUNS AND OVER-HEATING.

   Note one pack is supplied as standard. Additional packs can be purchased.
2. Transfer the Inner gel module containing cast gels into the main tank in the correct orientation as indicated - +ve on the module aligned with +ve on the tank, -ve on the module aligned with ï ve on the tank.
3. Fill the outer tank with 1 x reservoir buffer. See page 22 for recommended running buffer solution. Table 6 shows the volume of buffer required.
4. Load the samples into the wells using a pipette tip taking care not to damage the wells or induce any air bubbles.
5. Fill any unused wells with 1 X sample buffer.
6. It is a good idea to note the orientation and order the samples were loaded in. This can be done by noting which samples were loaded adjacent to each electrode.

Table 6.

Buffer Volume	**(C)VS10D** **VS10WD**	**VS20D,** **VS30D**
Minimum ï Inner tank is filled to above the wells. Outer Tank is filled to just flood the bottom of the glass plates. Cooling potential is at a minimum which may affect resolution.	250ml 500ml	1.2Litres 1.8 Litres
Maximum ï Inner tank is filled to above the wells. Outer Tank is filled to the maximum fill line. Cooling is high offering good resolution of samples.	1200ml 2.8 Litres	5.6 Litres 8.4 Litres
Using the cooling packs ï Inner tank is filled to above the wells. Cooling packs are inserted behind the gels. Outer Tank is filled to the maximum fill line. Cooling is at a maximum.	1000ml 2.3 Litres	4.6Litres 6.9 Litres

Gel Running:

1. Fit the lid and connect to a power supply.
2. Consult Table 7, page 16 for details on recommended power supply voltage settings.
3. Turn the power supply off when the loading dye reaches the bottom of the gel, sooner if your proteins are below 4Kd in size.
4. Remove the gel running module, first emptying the inner buffer into the main tank. Buffer can be re-used but this may affect run quality if continued.
5. Unscrew the glass plates and gently pry apart the glass plates. The gel will usually stick to one of the plates and can be removed by first soaking in buffer and then gently lifting with a spatula.
6. The gel is now ready to be stained with Coomassie or silver stain or the proteins in the gel can be transferred to a membrane by electroblotting for specific band identification and further analysis.

Table 7.

Recommended Voltages and Resultant Current for 1mm thick, 12% gels.	(C)VS10D, VS10WD	VS20D VS30D
One gel	90-225V 20-45mA	120-250V 20-45mA
Two gels	90-225V 40-90mA	120-250V 40-90mA
Three gels	90-225V 60-135mA	120-250V 60-135mA
Four gels	90-225V 80-180mA	120-250V 80-180mA

Stock Solutions for SDS PAGE gels:-

Stock 30% Acrylamide Gel Solution:-

30.0 g acrylamide

0.8 g methylene bisacrylamide

Distilled Water to 100ml

Stock 4 X Resolving Gel Tris (1.5 M Tris·HCl pH8.8, 0.4 % SDS)

To 110ml Distilled Water add 36.4 g of Tris base

Add 8ml of 10 % SDS

Adjust pH to 8.8 with 1N HCl

Adjust the final volume to 200ml with Distilled Water.

Stock 4 X Stacking Tris (0.5 M Tris·HCL pH6.8, 0.4 % SDS)

To 110ml Distilled Water add 12.12 g of Tris base

Add 8ml of 10 % SDS

Adjust pH to 6.8 with 1N HCl

Add Distilled Water to a final volume of 200ml

Stock 4 X Tris-glycine tank buffer - SDS

36 g Tris base

172.8 g glycine

Distilled Water to 3 L

1 x Tris-glycine tank buffer - SDS

750ml of 4 X Tris-glycine reservoir buffer - SDS

30ml of 10 % SDS

Distilled Water to 3L

10 % AP (ammonium persulphate solution)

0.1 g ammonium persulphate

1ml Distilled Water

TEMED

Stock 4 X Sample Buffer

4ml glycerol

2ml 2-mercaptoethanol

1.2 g SDS

5ml 4 X Stacking Tris

0.03 g Bromophenol blue

Aliquot into 1.5ml microcentrifuge tubes. Store at -20°C.

References:-

1. Sambrook, Fritsch, and Maniatis, **Molecular Cloning A Laboratory Manual,** Second Edition,

Cold Spring Harbor Laboratory Press, 1989.

2. **Current Protocols in Molecular Biology,** Greene Publishing Associates and Wiley-Interscience,1989.

VS20-DGGE Instructions

SPECIFICATIONS:

Control Unit:

Size: 80 x 96 x 140mm (H x W x D)

Mains Supply. 220 - 240V a/c. 50 - 60Hz

Mains Fuse. 5 Amp.

Input Fuse. 500mA, 240V Antisurge.

Output Voltage. 240 Volts.

Temperature Control Range. 0 - 200°C.

Controller Accuracy. +/- 2%.

Weight. 1.5Kg.

VS20-DGGE Tank:

2x 250w Heating Elements

1x PT100 Thermocouple

Instructions:-

Installation and Operation of the VS20-DGGE heating system

A. Installation

1. Connect the heating element plug into the socket at the rear of the control unit.
2. Connect the PT100 temperature sensing probe plug at the rear of the control unit.
3. Ensure the temperature dial is set to zero.
4. Connect the mains cable socket to the rear of the control unit then connect to an external power source.

CAUTION

Do not attempt to apply temperature to the tank without any buffer present.

B. Using the Heating Controller

1. Fill the tank with buffer to the required level.
2. Ensure all the leads are connected in the correct positions as highlighted on the instructions page on page 8.
3. Switch on the control unit to the rear of the unit and ensure that the red power light illuminates.
4. Turn the dial on the front of the control unit to the required temperature. The small red light will illuminate indicating the elements are switched on.
5. The heaters will remain on until the desired temperature has been reached, at which point the unit will switch on and off to maintain that temperature.
6. To obtain an accurate temperature of the buffer, it may be advisable to attach a temperature strip panel to the front of the tank.

C. Safety Considerations:

Should the sensor develop a fault or become disconnected the heaters will automatically switch off so safeguarding against gel overheating.

To replace a fuse isolate on the control unit from the mains supply and open the fuse holder with a screwdriver blade. The holder contains two fuses.

Always use the recommended fuse and **NEVER** replace it with one of a different rating.

Combs:–

MC Denotes Multi Channel Pipette compatible. (C)VS10D:-

Code	Description	Sample Volume µl for a

		5mm thick gel
VS10-1-0.75	Comb 1 Prep, 1 Marker, 0.75mm thick	500
VS10-5-0.75	Comb 5 sample, 0.75mm thick	70
VS10-8-0.75MC	Comb 8 sample MC, 0.75mm thick	40
VS10-9-0.75	Comb 9 sample, 0.75mm thick	35
VS10-10-0.75	Comb 10 sample, 0.75mm thick	30
VS10-12-0.75	Comb 12 sample, 0.75mm thick	25
VS10-16-0.75MC	Comb 16 sample MC, 0.75mm thick	20
VS10-20-0.75	Comb 20 sample, 0.75mm thick	15
VS10-1-1	Comb 1 Prep, 1 Marker, 1mm thick	650
VS10-5-1	Comb 5 sample, 1mm thick	100
VS10-8-1MC	Comb 8 sample MC, 1mm thick	60
VS10-9-1	Comb 9 sample, 1mm thick	50
VS10-10-1	Comb 10 sample, 1mm thick	40
VS10-12-1	Comb 12 sample, 1mm thick	35
VS10-16-1MC	Comb 16 sample MC, 1mm thick	25
VS10-20-1	Comb 20 sample, 1mm thick	20
VS10-1-1.5	Comb 1 Prep, 1 Marker, 1.5mm thick	1000
VS10-5-1.5	Comb 5 sample, 1.5mm thick	140
VS10-8-1.5MC	Comb 8 sample MC, 1.5mm thick	80
VS10-9-1.5	Comb 9 sample, 1.5mm thick	70
VS10-10-1.5	Comb 10 sample, 1.5mm thick	30
VS10-12-1.5	Comb 12 sample, 1.5mm thick	50
VS10-16-1.5MC	Comb 16 sample MC, 1.5mm thick	40
VS10-20-1.5	Comb 20 sample, 1.5mm thick	30
VS10-1-2	Comb 1 Prep, 1 Marker, 2mm thick	1300
VS10-5-2	Comb 5 sample, 2mm thick	200
VS10-8-2MC	Comb 8 sample MC, 2mm thick	120
VS10-9-2	Comb 9 sample, 2mm thick	100
VS10-10-2	Comb 10 sample, 2mm thick	80
VS10-12-2	Comb 12 sample, 2mm thick	70
VS10-16-2MC	Comb 16 sample MC, 2mm thick	50
VS10-20-2	Comb 20 sample, 2mm thick	40

VS20D, VS10WD:-

Code	Description	Sample Volume µl for a 5mm thick gel
VS20-1-0.75	Comb 1 Prep, 1 Marker, 0.75mm thick	1100
VS20-5-0.75	Comb 5 sample, 0.75mm thick	160
VS20-10-0.75	Comb 10 sample, 0.75mm thick	80
VS20-18-0.75MC	Comb 18 sample MC, 0.75mm thick	40
VS20-24-0.75	Comb 24 sample, 0.75mm thick	30
VS20-30-0.75	Comb 30 sample, 0.75mm thick	25
VS20-36-0.75MC	Comb 36 sample MC, 0.75mm thick	20
VS20-48-0.75	Comb 48 sample, 0.75mm thick	15
VS20-1-1	Comb 1 Prep, 1 Marker, 1mm thick	1500
VS20-5-1	Comb 5 sample, 1mm thick	200
VS20-10-1	Comb 10 sample, 1mm thick	100
VS20-18-1MC	Comb 18 sample, 1mm thick	50
VS20-24-1	Comb 24 sample, 1mm thick	40
VS20-30-1	Comb 30 sample, 1mm thick	35
VS20-36-1MC	Comb 36 sample MC, 1mm thick	25
VS20-48-1	Comb 48 sample, 1mm thick	20
VS20-1-1.5	Comb 1 Prep, 1 Marker, 1.5mm thick	2200
VS20-5-1.5	Comb 5 sample, 1.5mm thick	320
VS20-10-1.5	Comb 10 sample, 1.5mm thick	160
VS20-18-1.5MC	Comb 18 sample, 1.5mm thick	80
VS20-24-1.5	Comb 24 sample, 1.5mm thick	60
VS20-30-1.5	Comb 30 sample, 1.5mm thick	50
VS20-36-1.5MC	Comb 36 sample MC, 1.5mm thick	40
VS20-48-1.5	Comb 48 sample, 1.5mm thick	30
VS20-1-2	Comb 1 Prep, 1 Marker, 2mm thick	3000
VS20-5-2	Comb 5 sample, 2mm thick	400
VS20-10-2	Comb 10 sample, 2mm thick	200
VS20-18-2MC	Comb 18 sample, 2mm thick	100
VS20-24-2	Comb 24 sample, 2mm thick	80
VS20-30-2	Comb 30 sample, 2mm thick	70
VS20-36-2MC	Comb 36 sample MC, 2mm thick	50
VS20-48-2	Comb 48 sample, 2mm thick	40

VS30D:-

Code	Description	Sample Volume µl for a 5mm thick gel
VS30-1-1	Comb 1 Prep, 1 Marker, 1mm thick	2250
VS30-2-1	Comb 2 sample, 1mm thick	1125
VS30-4-1	Comb 4 sample, 1mm thick	550
VS30-28-1MC	Comb 28 sample, 1mm thick MC compatible	80
VS30-56-1MC	Comb 56 sample, 1mm thick MC compatible	40
VS30-75-1.5	Comb 75 sample, 1mm thick	25
VS30-1-1.5	Comb 1 Prep, 1 Marker, 1.5mm thick	3375
VS30-2-1.5	Comb 2 sample, 1.5mm thick	1680
VS30-4-1.5	Comb 4 sample, 1.5mm thick	825
VS30-28-1.5MC	Comb 28 sample, 1.5mm thick MC compatible	120
VS30-56-1.5MC	Comb 56 sample, 1.5mm thick MC compatible	60
VS30-75-1.5	Comb 75 sample, 1.5mm thick	37

Other combs available on request.

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Warranty

The Cleaver Scientific Ltd. (CSL) Electrophoresis units have a warranty against manufacturing and material faults of twelve months from date of customer receipt.

If any defects occur during this warranty period, CSL will repair or replace the defective parts free of charge.

This warranty does not cover defects occurring by accident or misuse or defects caused by improper operation.

Units where repair or modification has been performed by anyone other than CSL or an appointed distributor or representative are no longer under warranty from the time the unit was modified.

Units which have accessories or repaired parts not supplied by CSL or its associated distributors have invalidated warranty.

CSL cannot repair or replace free of charge units where improper solutions or chemicals have been used. For a list of these please see the Care and Maintenance subsection.

If a problem does occur then please contact your supplier or CSL on:-

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