Cleaver Scientific Ltd

EXPERTS IN ELECTROPHORESIS

VERTICAL ELECTROPHORESIS SYSTEMS

TYPICAL APPLICATIONS

Detecting mutations in genetics and cancer studies

FEATURES:

- Maximum 96-sample throughput compatible with microplates and thermal cycler blocks
- Four-screw vertical clamping technology accelerates set up
- Large format – 20x20cm glass plates for improved resolution
- 100ml gradient mixer, with valve-controlled 50ml reservoir and mixing chambers, makes two 1mm parallel denaturing gradient gels
- Microprocessor-controlled temperature control unit accurate to ±0.02°C

Denaturing Gradient Gel Electrophoresis

Denaturing Gradient Gel Electrophoresis (DGGE) is an important technique used in the search for mutations and DNA polymorphisms critical in genetic disorders and cancers, and to understand genetic diversity among species.

Supplied with the VS20WAVE-DGGE are:

The GM100 Gradient Mixer

- Forms efficient gradients by mixing and delivering high- and low-density denaturant solutions.
- The flat-base design and support handle of the GM100 allows it to be secured to a retort stand and mounted on a magnetic stirring plate (e.g. CSL-STIR).
- The mixing chamber accommodates a magnetic stirrer to form a linear gradient.
- Optional MUD01 peristaltic pump recommended.

The VS20WAVEDIRM PAGE Insert and Casting Base

- Employs innovative vertical screw clamp technology to assemble two vertical gels.
- Four-screw set up makes casting assembly faster.
- A built-in inner buffer chamber eliminates the need for heavy top tanks or buffer chambers.
- Its dual purpose PAGE insert makes plate transfer unnecessary, and is used with a cam casting base to guarantee efficient leak free casting
- Utilises all of the combs, glass plates and accessories of existing VS20WAVE units, providing full flexibility.
- Two 1mm 28-sample combs are supplied as standard while optional 48-sample combs allow screening to take place directly from 96-well thermal cycler blocks after PCR® amplification.

The VS20WAVE-DGGETC Temperature Controller

- Combines buffer recirculation with a heat sensor and 1.4kW heating element to facilitate precise temperature control to within ±0.02°C.
- Allows the gel temperature to be set to the melting temperature (Tm) of the amplified DNA polymorphism or mutation of interest.
- Features include: 4-digit 16mm LED panel; precise tuning to within 0.1°C resolution; an operating set point, plus three adjustable pre-set temperature values; and stirred buffer circulation for temperature stability and uniformity.

TECHNICAL SPECIFICATION

WAVE ELECTROPHORESIS INSERT AND TANK	
Max. Number of Gels	2 per run
Plate Dimensions (WxH)	20x20cm
Active Gel Dimensions (WxH)	16x17.5cm
Spacer Thicknesses	0.75, 1, 1.5 and 2mm
Max. Sample Capacity	96 samples; 48 per gel
Standard Combs	2x 1mm 24-sample
Available Combs	1, 5, 10, 18MC, 24, 36MC, 48; as per VS20WAVE unit
Max. Buffer Volume	8.5L
Unit Dimensions (w x d x h)	40.5 x 17 x 44cm
Weight	8kg
RECOMMENDED POWER SUPPLY	
Voltage	500V
Current	800mA/500mA
Power	300W/150W
TEMPERATURE CONTROL UNIT	
Temperature Control	PID
Operating Temperature Range	Ambient-100°C
Working Temperature Range (DGGE)	45-70°C
Buffer Recirculation Mechanism	Stirring
Temperature Uniformity/Stability at 37°C	±0.05/0.02°C
Setting/Display Resolution	0.1°C
Safety	Fluid-level float switch; isolated; IEC 1010 / CE
Stored Temperature Values	4
Heater Power at 230V/110VAC	1.4/1.3kW
Electrical Power at 230V/100VAC	1.5/1.4kW (50-60Hz)
GRADIENT MIXER	
Total Volume	100ml
Volume of Reservoir & Mixing Chambers	50ml
Internal Diameter of Outlet Port	2mm

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Distributor

ORDERING INFORMATION

VS20WAVE-DGGE	Complete Denaturing Gradient Gel Electrophoresis System, 20x20cm; includes: temperature control unit, cam casting base, glass plates with 1mm bonded spacers, 2x 24-sample combs and gradient mixer – 240 VAC version
VS20WAVE-DGGE$	VS20WAVE-DGGE – 110VAC version
VS20WAVE-DGGETC	VS20WAVE-DGGE Temperature Control Unit – 240VAC version
VS20WAVE-DGGETC$	VS20WAVE-DGGETC – 110VAC version
GM100	Gradient Mixer, 100ml
RECOMMENDED ACCESSORIES	
CSL-STIR	CSL Magnetic Stirrer, 19x19cm
MU-D01	Single Peristaltic Pump
MU-S16	Silicon tube I.D. 1/8", 25 ft
CS-500V	omniPAC Power Supply, 500V, 800mA, 300W
SOFTWARE OPTIONS	
Phoretix 1D	1D image analysis with band pattern matching
Phoretix 1D Pro	1D image analysis with band pattern matching between different gels
DGGE PACKAGE	
VS20WAVE-DGGEKIT	VS20WAVE Package Deal; includes: VS20WAVE-DGGE, CSL-STIR, MU-D01, MU-S16, CS-500V – 240 VAC version
VS20WAVE-DGGEKIT$	VS20WAVE-DGGEKIT – 110 VAC version

VS20WAVE-DGGE - APPLICATIONS

DGGE Description	DGGE Benefits
i. Determines the denaturing conditions required to identify unknown mutations	i. GM100 gradient mixer and optional MU-D01 peristaltic pump simplify casting of denaturing gradient gels
ii. Works on the principle that increasing denaturant concentrations melt DNA in a domain-specific manner, and the mutation or polymorphism of interest is in the DNA domain with the lowest Tm	ii. New VS20WAVE electrophoresis insert and cam caster for leak free casting
iii. Requires parallel DGGE – a technique where DNA samples are resolved at uniform temperature in gels containing a formamide and urea denaturant gradient parallel to the direction of electrophoresis	iii. Temperature control unit provides consistent run temperatures between 45-70°C
iv. Results in partial melting of DNA to produce a branched molecule identified by its reduced mobility within the gel	iv. High resolution 20x20cm format
CDGE Description	**CDGE Benefits**
i. Rapid screening method for multiple samples containing an identified mutation	i. Uses constant denaturant gels cast with new VS20WAVE electrophoresis insert and cam caster for leak free casting
ii. Requires DGGE beforehand to establish optimal denaturing conditions to identify a specific mutation	ii. Temperature control unit provides constant run temperature during electrophoresis
iii. No denaturant gradient required as multiple samples are screened in a constant denaturant gel	iii. Maximum 96-sample throughput (48 samples per gel)
iv. Increases throughput and alleviates bottlenecks	
HA Description	**HA Benefits**
i. Used when it is difficult to detect a homoduplex mutation by DGGE	i. New VS20WAVE electrophoresis insert and cam caster for leak free casting
ii. Requires denaturation and re-annealing of wild-type and mutant DNA mixed together, usually within a PCR reaction	ii. Gradient mixer simplifies DGGE option
iii. Resultant heteroduplexes are less stable and melt at a lower denaturant concentration than wild-type and mutant homoduplex molecules, allowing them to be identified by reduced mobility within the gel	iii. Optional temperature control for reproducibility
iv. Requires parallel DGGE, or may be performed overnight in a TBE gel made from special high-resolution acrylamide	iv. High resolution 20x20cm format