



DGGE



The newly designed VS20WAVE-DGGE is a complete system for DNA mutation analysis



o m n i P A G E Denaturing Gradient

The newly designed VS20WAVE-DGGE is a complete system for DNA mutation analysis. Using the innovative vertical screw-clamp technology of the new VS20-WAVE system, the VS20WAVE-DGGE is fully equipped – with temperature control unit, stirrer, gradient mixer and casting accessories – to perform specific mutation analysis applications.

- **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 $\pm 0.02^{\circ}\text{C}$**

The powerful microprocessor-controlled PID temperature control unit enables various mutation detection techniques to be undertaken between ambient temperature and 70°C , while the simple four-screw design of the WAVE insert accelerates set up of denaturing PAGE gels.

Accordingly, the new VS20-DGGE can be used to screen single-base pair changes in the following applications:

- Heteroduplex analysis (HA)
- Parallel Denaturing Gradient Gel Electrophoresis (DGGE)
- Constant Denaturing Gradient Gel Electrophoresis (CDGE)

Extensive accessories:

The flexibility provided by the modular design of the VS20WAVE-DGGE and its wide range of accessories enables laboratories to switch quickly and easily between different mutation detection techniques, thereby maximising throughput and screening efficiency. A maximum 96-sample throughput allows detection of as many mutations within a couple hours, alleviating many of the bottlenecks associated with screening for DNA mutations.

The GM100 gradient mixer is supplied as standard to ensure efficient gradient formation by mixing and delivering high- and low-density denaturant solutions. A flat-base design and support handle allows the GM100 to be secured to a retort stand, enabling it to be easily mounted on a magnetic stirring plate, while the mixing chamber can accommodate a magnetic stirrer to form a linear gradient. The MU-D01 peristaltic pump is also recommended for delivery of linear and reproducible gradient gels.

Software options:

3 packages:

Pre-electrophoresis: mutations are best detected when the single-base pair mutation itself is located within lowest melting domain of the DNA of interest, and the molecule does not denature entirely. GC-clamping at one end of the DNA molecule ensures that the region to be screened is in the lower melting temperature domain while the DNA molecule remains partly double-stranded.

Recommended free POLAND analysis software (G Steger, University of Dusseldorf) predicts the melting behaviour of the DNA fragment of interest and resulting primer placement and GC clamp positioning.

Post electrophoresis: CLIQS is available for band pattern matching following parallel DGGE in a single gel; CLIQS 1D Pro allows comparison between multiple gels and different experiments.



Innovative Casting and Set-up Mechanism

The VS20WAVE-DGGE utilises novel vertical screw clamp technology to assemble two vertical gels. This reduces the number of screws required for set up making casting assembly faster, while a built-in inner buffer chamber within the PAGE insert allows set-up to be completed without the inclusion of heavy top tanks or buffer chambers. A dual purpose PAGE insert eliminates the need for plate transfer, and is used with a cam casting base to guarantee efficient leak free casting.

Precise thermal control

The redesigned VS20DGGE-TC temperature control unit combines buffer recirculation with a heat sensor and 1.4kW heating element to facilitate precise temperature control to within 0.02°C, allowing the gel temperature to be set to the melting temperature (Tm) of the amplified DNA polymorphism or mutation of interest. Other benefits include: a conspicuous 4-digit 16mm LED panel to aid set-up; 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.

Programmable power supply option

At 500V, 800mA and 300W outputs, the optional powerPRO500 power supply provides full flexibility for different mutation detection techniques.



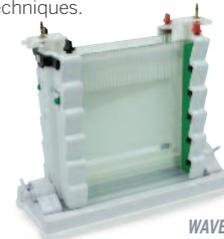
powerPRO500 power supply



CSL-STIR Magnetic Stirrer



MU-D01 Peristaltic Pump



WAVE electrophoresis insert and cam casting base

VS20WAVE-DGGE - APPLICATIONS

| Description | DGGE | CGGE | HA |
|---|--|--|--|
| | <ul style="list-style-type: none"> i. Determines the denaturing conditions required to identify unknown mutations 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 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 iv. Results in partial melting of DNA to produce a branched molecule identified by its reduced mobility within the gel. | <ul style="list-style-type: none"> i. Rapid screening method for multiple samples containing an identified mutation ii. Requires DGGE beforehand to establish optimal denaturing conditions to identify a specific mutation iii. No denaturant gradient required as multiple samples are screened on a constant denaturant gel iv. Increases throughput and alleviates bottlenecks | <ul style="list-style-type: none"> i. Used when it is difficult to detect a homoduplex mutation by DGGE ii. Requires denaturation and re-annealing of wildtype and mutant DNA mixed together, usually within a PCR reaction 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 iv. Requires parallel DGGE, or may be performed overnight in a TBE gel made from special high resolution acrylamide |
| VS20WAVE DGGE Application Benefits | <ul style="list-style-type: none"> i. GM100 gradient mixer and optional MU-D01 peristaltic pump simplify casting of denaturing gradient gels ii. New VS20WAVE electrophoresis insert and cam caster for leak free casting iii. Temperature control unit provides consistent run temperatures between 45-70°C iv. High resolution 20x20cm format | <ul style="list-style-type: none"> i. Uses constant denaturant gels cast with new VS20WAVE electrophoresis insert and cam caster for leak free casting ii. Temperature control unit provides constant run temperature during electrophoresis iii. Maximum 96-sample throughput (48 samples per gel) | <ul style="list-style-type: none"> i. New VS20WAVE electrophoresis insert and cam caster for leak free casting ii. Gradient mixer simplifies DGGE option iii. Optional temperature control for reproducibility iv. High resolution 20x20cm format |



Denaturing Gradient

TECHNICAL SPECIFICATIONS

WAVE ELECTROPHORESIS INSERT AND TANK

| | |
|-------------------------------|--|
| Max. Number of Gels | 2 per run |
| Plate Dimensions (W x H) | 20x20cm |
| Active Gel Dimensions (W x H) | 16 x 17.5cm |
| Spacer Thicknesses Buffer | 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 and MAXI units |
| 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 Total |
| Current | 800mA |
| Power | 300W |

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 |

GRADIENT MIXER

| | |
|---------------------------------------|-------|
| Total Volume 100ml | 100ml |
| Volume of Reservoir & Mixing Chambers | 50ml |
| Internal Diameter of Outlet Port | 2mm |

ORDERING INFORMATION

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|------------------|---|--------------|---|
| 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-DGGETC | Temperature Control Unit | | |
| GM100 | Gradient Mixer, 100ml | | |
| VS20WAVE-DGGEKIT | VS20-WAVE Package; includes VS20-DGGE, STIR, PP01, MU-S16, powerPRO500 | | |
| CSL-STIR | Magnetic Stirrer, 19 x 19cm | CLIQS | 1D image analysis with band pattern matching |
| MU-D01 | Single Channel Peristaltic Pump | CLIQS 1D Pro | 1D image analysis with band pattern matching between different gels |
| MU-S16 | Silicon tube I.D. 1/8", 25 ft (for peristaltic pump) | | |
| powerPRO500 | powerPRO 500 Power Supply, 500V, 800mA, 300W | | |

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