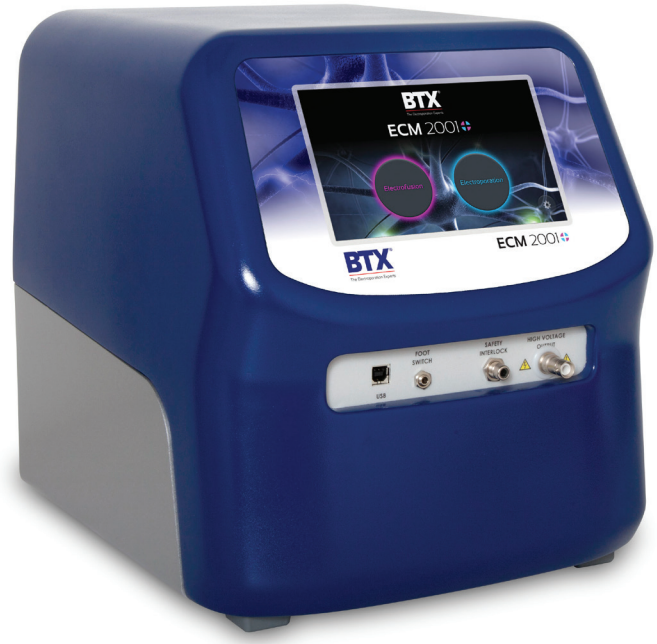
BTX®
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ECM 2001+ Electrofusion and Electroporation System



The ECM 2001+ is a multifunctional electrofusion and square wave electroporation generator. The ability to generate both AC and DC waves allows for fast and efficient cell fusion in hybridoma production, hybrid cell formation, and nuclear transfer applications. This system is powerful enough to yield high transfection efficiencies for cell lines and difficult to transfect cell types including stem cells and primary cells. The gentle square wave pulse also allows for high cell viability of these cell types.

Waveforms

AC sine wave aligns cells by dielectrophoresis for electrofusion applications. Square DC waveform provides the fusion pulse for electrofusion or is utilized in mammalian electroporation applications.

Electrofusion

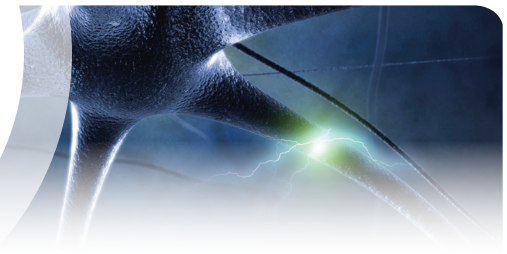
Fast, efficient cell fusion in hybridoma production, hybrid cell formation and nuclear transfer applications are facilitated by the combination of AC and DC wave pulses. Fusion is achieved by the generation of an AC current wave form that generates a benign dielectrophoretic alignment of cells. With a 30 ms switchover time from AC to DC, efficient fusion takes place. After fusion, the AC is reapplied maintaining the cell compression for the rounding off process resulting in a higher number of hybrids.

Electroporation

Electroporation is a standard method used to transfect mammalian cell lines to express recombinant human proteins which are used for therapeutic purposes. Gene delivery by this method is typically used in transient transfections to study protein expression or to temporarily knockout or “silence” these genes using siRNA. This is used to study gene targeting and function. Alternatively, adding additional selection steps to isolate stably transfected cells allows for integration of a gene into the genome of the cell for long term expression of protein. The use of the ECM 2001+ offers the control needed to adjust electrical settings for optimization of parameters.



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Applications

- Cell fusion
- Hybridoma production
- Nuclear transfer
- Embryo manipulation
- Mammalian cell transfection
- Plant protoplast fusion
- Stem cell production

Features

- AC waveform of 0.2 – 2.0 MHz
- Square wave electroporation capabilities
- A wide range of voltages from 5 V to 3000 V
- Advanced programming capability to combine multiple AC steps pre- and post- DC fusion step
- Capable of operating at low impedance loads
- Large touchscreen interface

Specifications

Square Wave Pulse, DC	
Voltage Range	LV Mode 5 to 500 in 1 V steps HV Mode 505 to 3000 in 1 V steps
Voltage Accuracy	5%
Pulse Length	LV Mode 10 to 999 µs in 1 µs steps or 1 to 999 ms in 1 ms steps HV Mode 1 to 999 µs in 1 µs steps
Multiple Pulsing	1 to 99 pulses per sample
Pulse Interval	0.1 s to 10 s
AC steps (up to 19 pre- and post- fusion)	
Frequency	0.2 to 2 MHz in 0.1 MHz steps
Voltage	5 to 75 V in 5 V steps
Duration	0 to 99 s 1 s steps
Wave Shape	Sine Wave
Sample Load Ranges	
All Voltages	Load must be ≥ 60 Ω
LV Mode	Pulse Length < 100 ms, Load must be > 8 – 9 Ω; Pulse Length > 100 ms, Load Must be >100 Ω
HV Mode	Load must be ≥ 40 Ω

Ordering Info

Order No.	Description	Included Items
45-2045	ECM 2001+ Cell Fusion System	ECM 2001+ Generator, Microslides (0.5 mm Gap, 3.2 mm Gap), Meander Fusion Chamber, Flat Electrode / Divergent Field, Electrode Adapter, Connection Cable, Safety Stand 630B, Cuvettes 1 mm, 2 mm, 4 mm, pkg. of 30 (10 each) and Cuvette Rack
45-2046	ECM 2001+ Electroporation System,	ECM 2001+ Generator, 630B Safety Stand, Cuvettes 1 mm, 2 mm, 4 mm, pkg. of 30 (10 each) and Cuvette Rack
45-2047	ECM 2001+ Embryo Manipulation System	ECM 2001+ Generator, Microslides, round wire (0.5 mm gap, 1.0 mm gap), rectangular wire (3.2 mm gap), Micrograbber adapter cables
45-2048	ECM 2001+ Hybridoma Production System	ECM 2001+ Generator, 2 ml Coaxial Optimization Chamber, 9 ml Coaxial Production Chamber, Female/Female Adapter Set, BTX Cytofusion Medium C 500 ml
45-2049	ECM 2001+ Generator Only	