BTX®
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Gemini X2 and X2 HT

Twin Waveform Electroporation Systems



The Gemini X2 Twin Wave Electroporator is a flexible system allowing both square wave and exponential decay wave electroporation in a single unit. Ideal for all of your electroporation needs, including CRISPR, in vivo, in vitro, in ovo and more.

The Gemini X2 provides the ultimate experimental flexibility. This one easy setup allows for transfections in cuvettes or high throughput plates, or the capability to utilize the wide variety of BTX specialty electrodes for specific applications. In addition, Gemini X2 electrical output specifications are wide-ranging, making it the most versatile electroporation system available today.

Electroporation of suspension cells can be achieved in cuvettes (X2) or 96-well plates (X2 HT) with an HT plate handler. Additionally, the Gemini X2 can be paired with BTX specialty electrodes to deliver gene and drugs in vivo, in utero, in ovo and to explant tissues as well as adherent cells.

Exponential Decay/Square Twin Waveforms

Select which type of waveform you would like to use to transfect eukaryotic cells or transform prokaryotic cells. Typically, eukaryotic cells respond best to square wave pulses while prokaryotic cells respond well to exponential decay wave pulses. Combining these two waveforms gives researchers total flexibility to achieve the highest efficiency for their application.

Simple User Interface

Permits intuitive touch screen or computer-controlled protocol programing and execution as well as password protection of protocols. This programmable system offers unlimited protocol storage as well as dozens of proven pre-set protocols to reduce optimization time.

Pre-Pulse Resistance Measurement

Offers assurance that sample resistance is within acceptable range for electroporation, protecting precious samples and system components against arcing.

Widest Voltage/Pulse length Range Available

Provides the widest range of voltage options available in the market. The Gemini X2 can achieve voltage delivery as low as 5 V and as high as 3000 V in both waveforms in addition to pulse lengths of 10 µs to 5 s, from delicate in ovo tissue to hearty gram positive bacteria.

Highly Accurate Pulsing

Delivers precise voltage, pulse length/time constant, pulse interval and displays the values back, allowing for visual confirmation of successful electroporation.

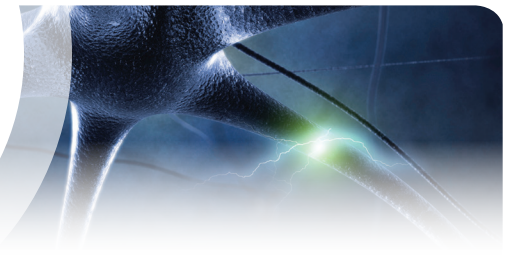
Revolutionary Arc Proofing Safety Features

Provides peace of mind knowing that samples and systems are safe from troublesome arcing with enhanced 4-way safety checks through the pulsing procedure. Two separate pre-pulse sample resistance monitoring scans ensure proper conditions. Internal safety features audit pulse progress in at the component and software level.

The Gemini is intended For Research Use Only. Not for use in diagnostic, pre-clinical, or clinical procedures.



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Gemini X2 and X2 HT Specifications

Square Wave Pulse Ranges	
Voltage Range	
LV Mode	5 to 500 in 1 V steps
HV Mode	505 to 3000 in 5 V steps
Voltage Accuracy	
LV Mode	5%
HV Mode	5%
Pulse Length Range	
LV Mode	10 to 999 µs in 1 µs step, 1 to 999 ms in 1 ms step
HV Mode	10 to 600 µs / 1 µs step
Multiple Pulsing	
LV Mode	1 to 99 pulses per sample
HV Mode	1 to 99 pulses per sample
Pulse Interval	0.1 s to 10 s
Exponential Decay Pulse Ranges	
Voltage Range	
LV Mode	5 to 500 in 1 V steps
HV Mode	505 to 3000 in 5 V steps
Voltage Accuracy	
LV Mode	5%
HV Mode	5%
Time Constant Range	
LV Mode	1 ms to 5.158 s
HV Mode	0.5 ms to 133.875 ms
Multiple Pulsing	
Multiple Pulsing	1 to 2 depending on device's current amplitude limit
Pulse Interval	5 to 30 s
Capacitance in µF	
LV Mode	25 to 3275 µF in 25 µF steps
HV Mode	10, 25, 35, 50, 60, 75, 85 µF
Available Internal Resistance Selections	
All Modes	LV 25 to 1575 Ω in 25 Ω steps, HV 50 to 1575 Ω in 25 Ω steps
Sample Resistance (Load) Exponential Decay or Square	
LV Mode	PL ≤100 ms, load ≥8 to 9 Ω, PL >100 ms, load ≥100 Ω
HV Mode	Load ≥ 40 Ω

Other Specifications	
Charging Time	LV <7 s, HV <4 s
Monitoring	Pulse Voltage, Width, Droop %, and Sample Resistance
User Interface	7.0-in color touchscreen
Arc Control	Yes
Interlock Switches	Yes
Pre-Pulse Sample resistance check	Yes
Pulse Over Current Protection	Yes
PC control	Yes
PC communications	Yes
Log Report	Yes
Remote Operation	Yes
Foot Switch Control	Yes
Power Ratings	35 W idle and 350 W pulsing
Input Voltage ratings	100 to 240 VAC
CE, ETL Marking, CB Scheme, EuRoHS	Yes
Dimensions (H x W x D) inches	12.75 x 11.25 x 8.5
Weight	~16 lb
Warranty	2 years

Ordering Info

Order No.	Description
45-2040	Gemini X2 Electroporation System with Safety Dome
45-2041	Gemini X2 Electroporation Generator Only
45-2044	Gemini X2 High Throughput System, 96-well with HT-200