

# ECM<sup>®</sup> 830 Specifications Sheet



## Description

The ECM 830 is a Square Wave Electroporation System designed for all *in vitro* and *in vivo* electroporation applications. The generator utilizes the new BTX Power Platform Technology and an all-new digital user interface.

All BTX T 820 square wave electroporation protocols are easily reproducible with the ECM 830 electroporation system. The ECM 830 possesses key features including finer voltage discrimination and 0.5 V accuracy, Arc Quenching™, the monitoring of all key parameters, and the control of pulse intervals.

## Applications

### Mammalian Cell Transfections/Gene Therapy

The use of square wave pulses for the transfection of mammalian cells is well established. Fakhrai has used the BTX T 820 in the technique of Electro-Immuno Therapy.<sup>1</sup> The ECM 830 will enable transfection of mammalian cells while maintaining higher cell viability.<sup>2</sup> For many mammalian cells, higher transfection efficiencies will also be obtained.<sup>3</sup>

### Mammalian Cell Protein/Drug Electroincorporation

Square wave pulses have been used to electroincorporate a variety of molecules into mammalian cells; Tsong has used square wave to load drugs into erythrocytes<sup>4</sup> while Marrero has used the BTX T 820 and BTX Model 366 Petri Dish Electrode to incorporate biologically active antibodies into RASM cells.<sup>5</sup>

### *In Vivo* Applications

Recent advances by Genetronics™ and BTX have allowed researchers to perform *in vivo* electroporation. *In vivo* Electro Gene Therapy has significant advantages over viral mediated gene transfer, biolistics, and the use of cationic lipids.<sup>6,7,8</sup>

### Nuclear Transfer

BTX square wave systems have been used by the experts in mammalian embryo manipulation techniques in nuclear transfer for applications ranging from pharmaceutical production to organ generation.<sup>9,10,11</sup>

### Plant Applications

Intact plant tissue and protoplasts may be transformed using electroporation<sup>12</sup>, and references indicate that square wave is indeed superior to exponential decay for plant protoplast transformation.<sup>13</sup>

### Bacterial and Yeast Electroporation

The ECM 830 is capable of reproducing our T 820 bacterial protocols, including all four E coli electrotransformation protocols referencing transformation efficiencies equivalent or superior to exponential decay results.<sup>14</sup> Square wave pulses are used to transform yeast species at high efficiencies relative to exponential decay electroporation.<sup>15</sup>

## Technical Specifications

### Standard Capabilities

<b>Operational Status:</b>	Internal self test upon start-up
<b>Interface:</b>	Digital User Interface
<b>Input:</b>	110 V/220 V Universal
<b>Charge Time:</b>	5 sec maximum (without delay)
<b>Voltage Range:</b>	5 – 500 V LV Mode/ 1 V resolution 30 – 3000 V HV Mode/ 5 V resolution
<b>Pulse Length Range:</b>	10 $\mu$ s – 999 $\mu$ s LV Mode/ 1 $\mu$ s resolution 1 msec – 999 msec LV Mode/ 1 msec resolution 1 sec – 10 sec LV Mode/ 0.1 sec resolution 10 $\mu$ s – 600 $\mu$ s HV Mode/ 1 $\mu$ s resolution Voltage dependent/internally controlled
<b>Multiple Pulsing:</b>	1 – 99
<b>Pulse Interval:</b>	100 msec - 10 sec
<b>Programmability:</b>	Storage for 2 setups (V,t,n, interval)
<b>Arc Control:</b>	Arc Quenching™
<b>Safety:</b>	Generator short circuit proof
<b>Other Electrical Characteristics</b>	
<b>Capacitance:</b>	4000 $\mu$ F
<b>Amperage:</b>	500 A limit at 10 $\mu$ s
<b>Physical Characteristics</b>	
<b>Footprint:</b>	12.5" x 12.25" x 5.5" (W-D-H)
<b>Weight:</b>	15 lbs (6.8 kg)
<b>Display:</b>	20 x 4 character LCD
<b>Controls:</b>	Single Rotary Encoder with push button toggle between all set parameters. Additional on/off Power and Start switches
<b>Interfaces:</b>	RS 232 and RS 485
<b>Monitoring:</b>	Monitoring and display of V, t, n, interval
<b>Remote Operation:</b>	Footswitch available. Please contact BTX Technical Services at 1-800-289-2465 or tech@genetronics.com for assistance.

### Ordering Information

#### System

<b>Model No</b>	<b>Available Configurations</b>
<b>8300</b>	<b>ECM 830 Electroporation System</b> ECM 830 Generator with Power Supply Model 630 B Safety Stand Model 610, 620, 640 Disposable Electroporation Cuvettes Plus™ 10 ea Model 660 Cuvette Rack Manuals and Instruction Sheets

#### Accessories

<b>Model No</b>	<b>Description</b>
<b>4001</b>	Enhancer™ 400 Graphic Pulse Monitor with Computer and Printer Interfaces
<b>610</b>	Cuvettes Plus, 1 mm gap, 50/pkg
<b>620</b>	Cuvettes Plus, 2 mm gap, 50/pkg
<b>640</b>	Cuvettes Plus, 4 mm gap, 50/pkg

### References

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3. Takahashi, M. et al., Leukemia Research, 15 (6): 507-513 (1991)
4. Tsong, T., et al., Biblthca Haemat, 51: 108-114 (1985)
5. Marrero, M., et al., The Journal of Biological Chemistry, 270 (26): 15734-15738 (1995)
6. Miramatsu et al., International Journal of Molecular Medicine, 1: 55-62 (1998)
7. Nishi, T., et al., Cancer Research, 56: 1050-1055 (1996)
8. Heller, R., et al., FEBS Letters, 389: 225-228 (1996)
9. Cambell, K., PPL Therapeutics, Roslin, Scotland, Personal Communication (1998)
10. Cibelli, Jose et al., Science, 280: 1256-1258 (1998)
11. Meng, J., et al., Biology of Reproduction, 57: 454-459 (1997)
12. Lin, C., et al., Plant Physiol. Biochem., 35 (12): 959-968 (1997)
13. Saunders, J., Guide to Electroporation and Electrofusion, 227-247 (1991)
14. BTX Protocols PR0182, PR0183, PR0336, PR0342 (1998)
15. Costaglioli, P., et al., Current Genetics, 27 (1): 26-30 (1994)

This product meets the requirements of the European Communities (EC), and complies with EMC Directive 89/336/EEC and 73/23/EEC for product safety.