

Technical & Customer Service

BTX[®] is the ultimate resource for technical information on the use of high voltage electric fields for performing high efficiency cell fusion, embryo manipulation, gene transfer, bacterial transformation and general electroporation of molecules and drugs into cells. We constantly track and monitor all scientific publications in this area. Our Technical Service group extracts and enters pertinent information, such as results and parameters from these papers into a Database Management System. The resultant database can be accessed and searched on any combination of the field identifiers.

For technical assistance, information on repairs or service, or any other questions, please contact BTX customer service.

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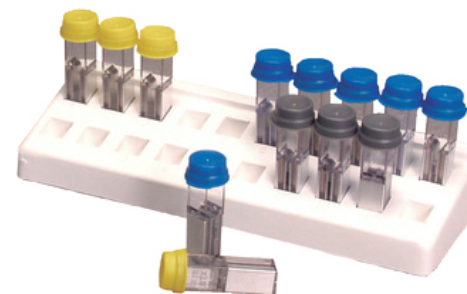
Web www.btxonline.com

If outside of the United States and Canada call your nearest BTX Distributor. See our website for a listing of authorized representatives.

Ordering Information

Catalog No.	BTX Model	Product
45-0124	610	Disposable Cuvettes, 1mm Gap, pkg. of 50
45-0125	620	Disposable Cuvettes, 2mm Gap, pkg. of 50
45-0126	640	Disposable Cuvettes, 4mm Gap, pkg. of 50
45-0207	630B	Safety Stand
45-0212	PEP-BLU	Personal Electroporation Pak
45-0208	660	Cuvette Rack, 20 Position
45-0059	VIP 3000SC	VIP 3000 Monitoring System

Meets requirements of Directive 89/336/EEC for Electromagnetic Compatibility (EC) and Low-Voltage Directive 73/23/EEC for Product Safety.



Instructions For:

- 45-0124** Model 610 Disposable Cuvettes Plus, 1mm Gap Size
- 45-0125** Model 620 Disposable Cuvettes Plus, 2mm Gap Size
- 45-0126** Model 640 Disposable Cuvettes Plus, 4mm Gap Size

The BTX Disposable Cuvettes Plus are available in 1mm, 2mm and 4mm gap sizes, yielding a wide range of homogeneous field strengths suitable for all cell types. Each Cuvettes Plus package includes a disposable cuvette and pipette. The cuvettes are one-piece injection molded chambers with embedded aluminum electrodes and round sealing caps. The pipette is used after the electroporation process for removal of the sample. The Cuvettes Plus are individually packaged and gamma irradiated for guaranteed sterility. They are compatible with all BTX generator systems listed below, as well as most other commercial pulse generators.

IMPORTANT: Read all Instructions, Warnings and Precautions prior to use.

FOR RESEARCH PURPOSES ONLY

Electrical & Technical Specifications

Standard Capabilities *Depending on buffer composition, volume, and generator capability.

Specifications	
Voltage Range	0 to 3000 VDC; 0 to 250 VAC
Frequency	1 MHz
Pulse Length/Time Constants Range	10 µsec to 10 sec
Pulse Number Range	1 to 99 (depending on voltage)
Operating Temperature	5° to 40°C
Intended Use	Indoor Use
Relative Humidity	20 to 80%
Maximum Altitude	2000 m (6562 ft)
Pollution Degree	II
Insulation Category	CAT I
Cap Color:	
Model 610	Gray
Model 620	Blue
Model 640	Yellow
Gap Size:	
Model 610	1 mm
Model 620	2 mm
Model 640	4 mm
Minimum/Maximum Volume:	
Model 610	20 µl / 90 µl
Model 620	40 µl / 400 µl
Model 640	80 µl / 800 µl
Generator Compatibility	ECM® 2001, ECM 830, ECM 630, ECM 399, ECM 395, ECM 600, ECM 200 and T820
Monitoring	VIP 3000 Monitoring System recommended

Definition of Symbols

Warning – Refer to instructions for use in order to find the nature of any potential hazard and any actions which have to be taken.



Caution – Risk of electric shock. Dangerous voltage that could result in injury or loss of life.

**Safety Guidelines**

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazard, use this product only as specified. Only qualified BTX personnel should perform service procedures.

**Arcing Can Occur at High Voltages**

An unfavorable combination of parameters such as high voltage settings and a small sample volume with a highly conductive medium might lead to flashover between the electrodes (ARC) and/or explosive evaporation of the medium. Reduce voltage, pulse length, or increase sample volume to avoid repeating this condition.

Do Not Operate with Suspected Failures

If you suspect there is damage to the product, have it inspected by qualified BTX service personnel.

Do Not Contact Electrodes

To avoid fire or shock hazard, observe all ratings and markings on the product or in the manual before using the device.

Avoid Exposure to Contact

Do not insert fingers or try to remove electrode or sample during pulsing sequence.

Wear Proper Eye Protection During Electroporation**Do Not Operate in an Explosive Environment****Do Not Operate in Wet/Damp Conditions****Intended Use**

The BTX Disposable Cuvettes Plus are intended for use with the BTX Safety Stand, Personal Electroporation Pak's, and the BTX pulse generators listed on the previous page. This document provides the information necessary for using the Cuvettes Plus with the BTX Electroporation Systems. These instructions are supplemental to the instruments operating manual. Refer to the respective instrument manual prior to using the cuvettes. If you are planning to use these cuvettes with other manufacturers' electroporation instruments, please contact BTX for interfacing and safety information.

Sample Preparation

BTX protocols outline detailed information on sample preparation. Please request protocols by contacting BTX technical support techsupport.btx@harvardapparatus.com. In sample preparation, the medium used represents a certain electrical resistance to the power supply. The cuvette resistance is determined by the cuvette geometry and the specific conductivity of the medium. These variables could cause a voltage drop when using highly conductive media such as PBS.

Limitations

Each cuvette should be filled to at least the minimum volume indicated to ensure application of proper voltage to the cell suspension. If a lesser amount is used, the medium may boil at high field strengths thereby reducing the cell viability. An arc can occur at high amplitude settings if the chambers are only partially filled. Each disposable cuvette is designed for a single use. Repeated use may compromise results and is at the customer's own risk.

Instructions for Use

WARNING HIGH VOLTAGE. Make sure the BTX Pulse Generator is switched off before continuing.

1. Attach the safety stand cables to the output on the rear or the front panel of the generator depending on the BTX generator being used. If using the VIP 3000 Monitoring System, attach the cables to the VIP 3000 and then attach cables from the VIP 3000 to the generator. Refer to the VIP 3000 Monitoring System user's manual for instructions on how to use.
2. Using aseptic techniques, pipette the correct volume of cell suspension and reagents into the cuvette. Replace the cap.
3. Open the safety stand shield and place the cuvette in between the metal contacts. Adjust the distance between the contacts and the cuvette using the black roller, so that the cuvette has good contact (Note: the adjustment will remain the same after the first time, simply insert the cuvette between the contacts and remove after electroporation. Check cuvette contact periodically to ensure good current flow). Close the shield. If using the cuvette with a PEP then refer to the instructions for that device.
4. Switch on the BTX pulse generator. Check that all instrument settings and connections are correct. Deliver the electroporation pulse by pressing the appropriate START or PULSE button depending on the BTX Generator being used.
5. After the pulse is delivered, remove the cuvette from the safety stand. Use the pipette to remove the pulsed cells. Treat the pulsed cells according to the protocol.
6. Discard the cuvette and pipette in a typical biohazard container. Refer to your country's waste management organization for proper disposal practices.

Troubleshooting

Please contact BTX Technical Service at any of the numbers listed on the following page in the event of any failure.

Warranty

The BTX warrants that Disposable Cuvettes Plus are free of defects at time of delivery to the user. If a defect is found, product may be returned for exchange only within a period of 90 days from time of delivery from BTX or an authorized BTX Distributor. If any defects covered by this warranty appear within the above period, BTX shall have the option of repairing or replacing the product at its expense. Such repair or replacement shall be the customer's exclusive remedy for breach of warranty or for negligence. This warranty does not extend to any product which has been

- (a) subjected to misuse, neglect, accident or abuse
- (b) repaired or altered by anyone other than BTX without BTX' express and prior approval
- (c) used in violation of instructions furnished by the BTX. Manufacturer shall not be liable for any special or consequential damages or for loss, damage or expense (whether or not caused by or resulting from Manufacturer's negligence) directly or indirectly arising from use of the product sold here under either separately or in combination with any other product or from any other cause.

The above warranty shall be in lieu of and excludes all other expressed or implied warranties of merchantability, or fitness for any purpose, or otherwise. Without limiting the generality of the foregoing, Manufacturer shall not be liable for any claims of any kind whatsoever, as to the product delivered or for non-delivery of equipment, and whether or not based on negligence.

Manufacturer will correct any malfunction not caused by operator abuse at no charge for parts and labor. All service under the warranty will be made at BTX, Holliston, Massachusetts, USA facilities or at another location approved by BTX. Owner will ship product prepaid to Holliston, Massachusetts. Manufacturer will return the product, after servicing, freight prepaid to owner's address. Warranty is VOID if the product is changed in any way from its original factory design or if repairs are attempted without written authorization by Manufacturer. Warranty is VOID if parts or connections not manufactured by Manufacturer are used with a BTX product.

Note: Under no conditions should any product be returned without prior approval and a return materials authorization (RMA) number from manufacturer.