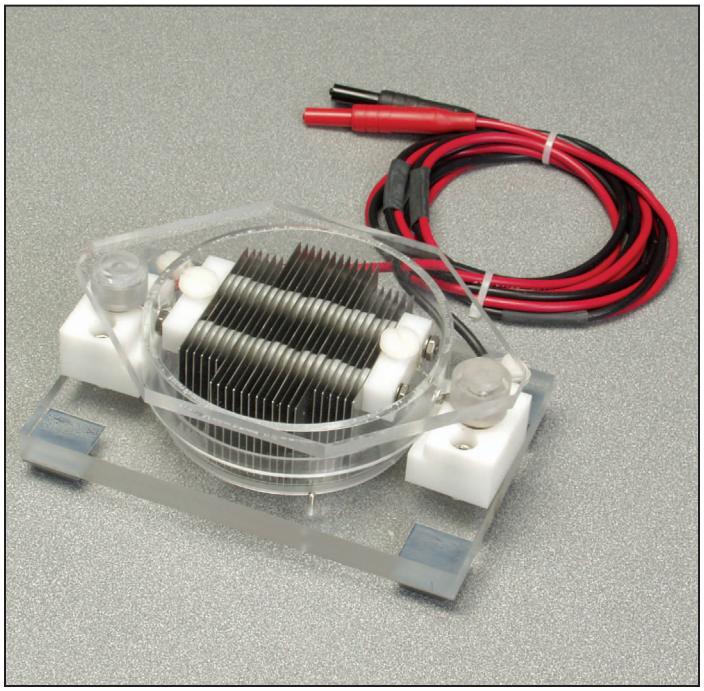
Petri Dish Electrode

USER'S MANUAL

BTX®
HARVARD APPARATUS
The Electroporation Experts



INTRODUCTION

The Petri Dish Electrode is designed to be used with a 100 mm Petri dish which functions as the electroporation chamber. To perform electroporation or electrofusion, the samples are placed in the Petri dish and the electrode assembly is lowered into the dish. The electrodes are 2 mm apart and are made of stainless steel. They are parallel and thus create a homogeneous field. They are designed to electroporate volumes ranging from 10 to 50 ml. The 2mm gap Petri Dish Electrode can be used for electroporation of tissues grown right in the petri dish. Simply add the exogenous molecule of interest, mix and electroporate.

When electroporating adherent cells, the distance between the electrodes and the petri dish can be adjusted by placing plastic foil underneath the petri dish. The electrodes need to be in contact with the cells, but not cutting through.

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

FOR RESEARCH PURPOSES ONLY

Order No.	Model	Description
45-0100	366	Petri Dish Electrode, 2 mm Gap, Stainless Steel

Petri Dish Electrode

GENERAL INFORMATION

Warranty

BTX/Harvard Apparatus warranties this BTX Petri Dish Electrode for a period of 90 days from date of purchase. At its option, BTX/Harvard Apparatus will repair or replace the item if it is found to be defective as to workmanship or material. This warranty does not extend to damage resulting from misuse, neglect, or abuse, normal wear and tear, or accident. This warranty extends only to the original customer purchase.

IN NO EVENT SHALL HARVARD APPARATUS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, OR OF ANY OTHER NATURE.** Some states do not allow this limitation on an implied warranty, so the above limitation may not apply to you. If a defect arises within the 90 day warranty period, promptly contact: **BTX/Harvard Apparatus, 84 October Hill Road, Holliston, Massachusetts 01746-1388** using our toll free number **1-800-272-2775 (Outside the U.S. call 1-508-893-8999).** Goods will not be accepted for return unless an RMA (Return Materials Authorization) number has been issued by our customer service department. The customer is responsible for shipping charges. Please allow a reasonable period of time for completion of repairs or replacement and return. If the unit is replaced, the replacement unit is covered only for the remainder of the original warranty period dating from the purchase of the original device. This warranty gives you specific rights, and you may also have other rights which vary from state to state.

Note: BTX electrodes are not recommended for use with power supplies or cables from other manufacturers. Such use is completely at the customer's own risk as it may result in damage, create unsafe conditions and will immediately void the 90 day warranty.

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

Technical & Customer Service

BTX® is the ultimate resource for technical information on the use of high voltage bacterial transformation and general electroporation of molecules and drugs into cells. We constantly track and monitor scientific publications in this area. Our Technical Service group extracts and enters pertinent information, such as results and parameters from these papers into a Protocol database. This database is available via the BTX website. Please visit www.btxonline.com. For technical assistance, additional information or an inquiry/request for repair service, contact BTX/Harvard Apparatus Technical Support/Customer Service Group at:

BTX®
A Division of Harvard Apparatus
84 October Hill Road
Holliston, MA 01746-1388 U.S.A.
Toll Free: 1-800-272-2775 (U.S. only)
Phone: 1-508-893-8999
Fax: 1-508-429-5732
E-mail: techsupport.btx@harvardapparatus.com
Internet: www.btxonline.com (click on customer service)

If outside the United States and Canada: call **1-508-893-8999** or contact your nearest BTX Distributor. A complete list of distributors is on our website.

GENERAL SAFETY INFORMATION

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.

To Prevent Hazard or Injury:

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 or pulse length 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 this 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

Safety Terms and Symbols:

Terms that appear in this manual:

WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.

CAUTION. Caution statements identify conditions or practices that could result in damage to these products or other property.

Symbols that may appear on the products:

Danger High Voltage

Attention Refer to Manual

Protective (Earth) Terminal

Functional Ground Terminal

Petri Dish Electrode

OPERATION: GETTING STARTED

WARNING HIGH VOLTAGE

Make sure the BTX electroporator is switched off before continuing.

1. Attach the banana cable into the voltage output of the BTX electroporator. If using the Enhancer 3000® Monitoring System, attach the cables to the Enhancer 3000® and then attach the cables from the Enhancer 3000® to the electroporator. Refer to the Enhancer 3000® for instructions for use.
2. Following instructions for the BTX electroporator set the appropriate parameters.
3. Prepare tissue and sample for electroporation.
4. Deliver the electroporation pulse(s) to the sample.
5. Remove the electrodes carefully and prepare for the next experiment.
6. The Petri Dish Electrode is easy to clean. Wash with soap and water and sterilize with alcohol.

APPENDIX A: SPECIFICATIONS

Petri Dish Electrode Electrical & Technical Specifications

Standard Capabilities:

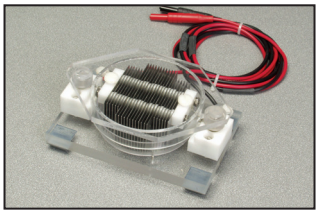
Voltage Range	0 to 2000 VDC (Do not use AC current)
Pulse Length Range	1 µsec to 40 msec
Pulse Number Range	1 to 99 (depending on voltage)
Operating Temperature	5º to 40ºC
Intended Use	Indoor use only
Relative Humidity	20 to 80%
Maximum Altitude	2,000 m (6,562 ft)
Pollution Degree	II
Insulation Category	CAT I

Physical Characteristics:

Dimensions, L x W x D	15.2 x 10.2 x 6.4 cm (6 x 4 x 2.5 in)
Volume Range	10 to 50 ml
Electrode Gap	2 mm
Electrode Material	Stainless Steel

Compatibility:

Generators	ECM® 830, 630 and 2001
Monitoring	The Enhancer 3000® Monitoring System recommended



Petri Dish Electrode
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CAUTION
FOR RESEARCH USE ONLY
NOT FOR CLINICAL USE ON PATIENTS

Max volume and voltage settings:

Table A illustrates the maximum volume and the voltage settings that can be used in order to obtain the maximum pulse length in a 2mm gap Petri Dish Electrodes. In the HV mode the maximum pulse length using a non-conductive media (H20) at 2000 volts and 50 ml volume is 4.3 msec (Warning: Do not set the voltage higher than 2000 volts since an arc may occur). If the volume is decreased to 15 ml, the maximum pulse length is 7.3 msec using a non-conductive media (H20).

Table A

Experiment #	1	2	3	4	5	6	7
Media	H_2O	H_2O	H_2O	PBS	PBS	PBS	PBS
Volume ml	50	50	15	10	10	10	10
Voltage Mode	HV	HV	HV	LV	LV	LV	LV
Set Voltage (V)	500	2000	2000	100	150	250	500
Actual Voltage (V)	480	2000	2000	60	101	195	445
Set Capacitance (µF)	50	50	50	3175	3175	3175	3175
Set Resistance (Ohms)	R10	R10	R10	R10	R10	R10	R10
Pulse Length (msec)	5.3	4.3	7.3	1.9	1.67	1.3	1.26
Chamber Resistance (Ohms)	160	153	400	0.4	0.37	0.37	0.38

APPENDIX B: REPLACEMENT PARTS

Order No.	Model	Description
45-0100	366	Petri Dish Electrode, 2 mm Gap, Stainless Steel
45-0059	VIP3000SC	The Enhancer 3000® Monitoring System

APPENDIX C: TROUBLESHOOTING

Please contact BTX Technical Service at any of the numbers listed below in the event of any failure.

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Holliston, MA 01746-1388 U.S.A.
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Phone: 1-508-893-8999
Fax: 1-508-429-5732
E-mail: techsupport.btx@harvardapparatus.com
Internet: www.btxonline.com (click on customer service)

APPENDIX D: MAINTENANCE

WARNING

Do not attempt maintenance while the Petri Dish Electrode is plugged into a pulse generator. Clean the Petri Dish Electrode body with a soft cloth or tissue. If necessary, moisten the cloth or tissue with a dilute detergent solution. Clean the electrodes between each experiment by washing with a mild detergent using a cloth or soft bristled brush.

WEEE/RoHS Compliance Statement

EU Directives WEEE and RoHS

To Our Valued Customers:

We are committed to being a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation.

The European Union (EU) has enacted two Directives, the first on product recycling (Waste Electrical and Electronic Equipment, WEEE) and the second limiting the use of certain substances (Restriction on the use of Hazardous Substances, RoHS). Over time, these Directives will be implemented in the national laws of each EU Member State.

Once the final national regulations have been put into place, recycling will be offered for our products which are within the scope of the WEEE Directive. Products falling under the scope of the WEEE Directive available for sale after August 13, 2005 will be identified with a "wheelie bin" symbol.

Two Categories of products covered by the WEEE Directive are currently exempt from the RoHS Directive – Category 8, medical devices (with the exception of implanted or infected products) and Category 9, monitoring and control instruments. Most of our products fall into either Category 8 or 9 and are currently exempt from the RoHS Directive. We will continue to monitor the application of the RoHS Directive to its products and will comply with any changes as they apply.

- **Do Not Dispose Product with Municipal Waste**
- **Special Collection/Disposal Required**

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