

ADHERENT CELL ELECTRODE

USER'S MANUAL

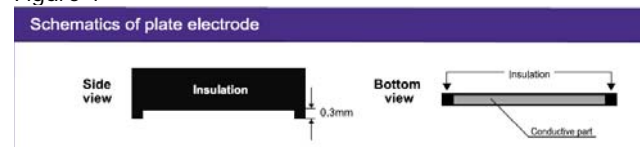


INTRODUCTION

The Adherent Cell Electrode is a reusable electroporation applicator designed to fit into each single well of a 12-well plate, 6-well plate or an individual 35 mm diameter Petri dish. This plate electrode is specially designed to electroporate cultured monolayers of cells on laminin-coated filters, or on 12 mm polycarbonate or polyester transwell filter units (0.4 mm pore size) or can directly electroporate adherent cells such as human corneal keratocytes, Caco-2, dental pulp cells, NC65 and BCEC and MDCK cells. The Adherent Cell Electrode consists of two parallel plate electrodes, 7 x 19 mm with 5 mm gap spacing between the plates. Each plate electrode has a 0.3 mm height insulated foot at both ends of the bottom. When the electrode is placed in a dish, a foot minimizes the damage on cells (as the conductive

part of an electrode will not touch cells directly, see schematics in Figure 1). The high voltage cables are connected to a BTX electroporator, and the electrode is brought down onto the filter until it makes contact with the buffer, usually at 1- 2 mm above the filter. A combination of HV and LV pulses may be used. The entire applicator may be cleaned with mild detergent, and the electrodes may be sterilized with ethanol.

Figure 1



REFERENCE

Deora, A. et al., Efficient Electroporation of DNA and Protein

into Confluent and Differentiated Epithelial Cells in Culture, *Traffic*, 2007

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

FOR RESEARCH PURPOSES ONLY

SAMPLE PREPARATION

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

Order No. Model Description

45-0530 Adherent Cell Electrode

45-0204 Cable Adapters

GENERAL INFORMATION

Warranty

BTX/Harvard Apparatus warranties this BTX Adherent Cell 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/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 Attention Protective Functional High Refer to (Earth) Ground Voltage Manual Terminal

Terminal

OPERATION: GETTING STARTED

WARNING HIGH VOLTAGE

Make sure the BTX electroporator is switched off before continuing.

1. Attach the Cable Adapters (cat. 45-0204) into the Adherent Cell Electrode cables. Plug the male ends of the Cable Adapters into the voltage output of the BTX electroporator.
2. If using the Enhancer 3000[®] attach the cables to the Enhancer, then attach the cables from the Enhancer to the Generator. Refer to the Enhancer 3000[®] manual on instructions for use.
3. Following instructions for the BTX electroporator, set the appropriate parameters on the generator.
4. The procedure should be performed at Room Temperature in a sterile tissue culture hood. Place the Adherent Cell electrode into the appropriate well of the 6 or 12-well tissue culture dish, allowing the foot of the plate to rest on the filter base or membrane, if applicable.
5. Deliver the electroporation pulse(s) to the sample.
6. Remove the electrode, clean as appropriate and complete delivery of pulses to all wells. Culture cells according to standard protocols.

Cleaning the electrode between samples

1. When changing the plasmid type or sample in between wells, use 70% ethanol to sterilize the electrodes.
2. Or you may fill wells of a 12-well or 6-well plate with 3 ml of serum-free and dip the electrode sequentially into the two wells of serum-free media. Dab the electrode with Kimwipe gently to dry. Then dip the electrode into the well with the

actual sample and deliver the pulse. This will ensure that no cross contamination is introduced. Do this each time you change the sample type.

APPENDIX A: SPECIFICATIONS Adherent Cell Electrode Electrical & Technical Specifications Standard Capabilities:

Voltage Range 0 to 300 VDC (Do not use AC current)
Pulse Length Range 1 µsec to 35 msec
Pulse Number Range 1 to 99 (depending on voltage)
Operating Temperature 5° to 40°C
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:

Number of Electrodes 2
Volume Range 0.5 to 3.0 ml
Gap Size 5 mm

Compatibility:

Generators ECM[®] 630, 630 and 2001
Monitoring The Enhancer 3000[®]
Monitoring System
Recommended

APPENDIX B: REPLACEMENT PARTS

Order No.	Model Description
45-0530	Adherent Cell Electrode
45-0204	Cable Adapters
45-0059	Enhancer 3000 Monitoring System

Meets requirements of Directive 89/336/EEC for Electromagnetic Compatibility (EC) and Low-Voltage Directive 72/23/EEC for Product Safety.

APPENDIX C: TROUBLESHOOTING

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

BTX/Harvard Apparatus

84 October Hill Road
Holliston, MA 01746-1388 U.S.A.
Toll Free: 1-800-272-2775 (US only)
Phone: 1-508-893-8999
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m
Internet: www.btxonline.com (click
on customer service)

APPENDIX D: MAINTENANCE

Do not attempt maintenance while the Adherent Cell Electrode is plugged into an electroporator. Clean the polyurethane electrode base with a soft cloth or Kimwipe. If necessary, moisten the cloth or Kimwipe with a dilute detergent solution. Clean the electrode plates by washing with a mild detergent using a soft bristled brush, or by using fine sand paper to gently remove any build-up or corrosion. Alternatively, the electrode head can be placed into an ultrasonic water bath and cleaned with mild detergent under sonication. Do not immerse the electronic components of the electrode head.