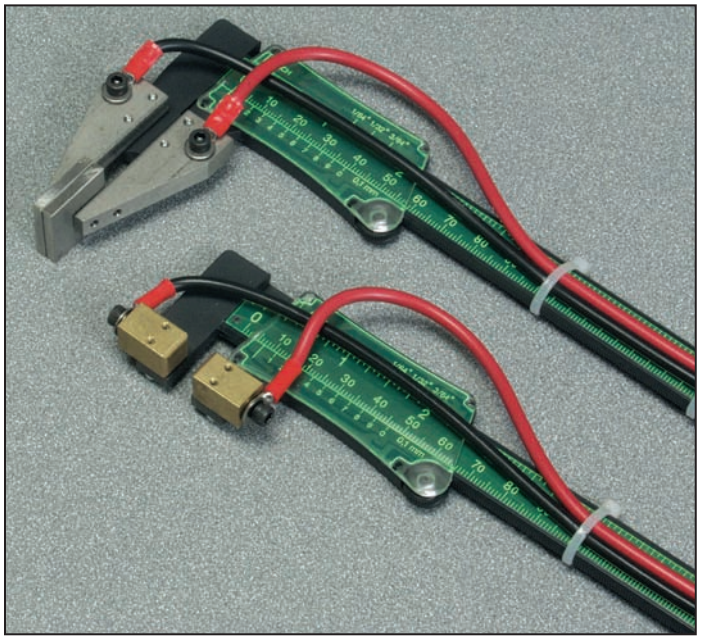
Caliper Electrodes

USER'S MANUAL

BTX®
HARVARD APPARATUS
The Electroporation Experts



INTRODUCTION

The BTX Caliper Electrodes are caliper style re-usable electrodes that are used for a variety of in vivo applications. Caliper Electrodes come in two models, with each model consisting of a caliper and a pair of end plates. Model 384 is used for smaller animals with a smaller surface area, while model 384L is used to target larger surface areas. The end plates may be adjusted by using the roller of the calipers. The electrodes span the target area following injection of the molecule of interest and electroporation pulses are delivered. The electric field introduced by the Caliper Electrodes causes transient pores to form in the cell of the tissue, allowing uptake of the molecules into the cells. Properly maintained, Caliper Electrodes have an unlimited life and are compatible with the ECM® 630, 830 and 2001.

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

FOR RESEARCH PURPOSES ONLY

Order No.	Model	Description
45-0101	384	Caliper Electrode, Brass 1 x 1 cm Electrodes
45-0102	384L	Caliper Electrode, Stainless Steel, 1.5 x 1.5 & 2.0 x 2.0 cm Electrodes

Caliper Electrodes

GENERAL INFORMATION

Warranty

BTX/Harvard Apparatus warranties this BTX Caliper Electrodes 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

Caliper Electrodes

OPERATION: GETTING STARTED

WARNING HIGH VOLTAGE

1. Attach the Caliper Electrodes directly to the voltage output of the BTX electroporator. If using the Enhancer 3000®, attach the cables to the Enhancer and then attach cables from the Enhancer to the electroporator. Refer to the Enhancer 3000® for instructions for use.
2. Prepare the tissue for electroporation.
3. Following instructions for the BTX electroporator, set the appropriate parameters.
4. Use the Caliper Electrodes to span the target tissue, i.e. limb, ear, skin fold, etc. Warning: Keep hands as far away from the electrodes as possible while delivering the pulse(s). Electrode plates and exposed metallic surfaces are hazardous during pulsing and severe injury may occur if contacted.
5. Deliver the pulse(s) to the target tissue.

APPENDIX A: SPECIFICATIONS

Caliper Electrodes Electrical & Technical Specifications

Standard Capabilities:

Voltage Range	0 to 500 VDC (Do not use AC current)
Pulse Length Range	1 µsec to 99 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

Model 384	1.0 x 1.0 cm
Model 384L	2.0 x 2.0 cm & 1.5 x 1.5 cm

Electrode Gap

Model 384	0.1 to 13 cm
Model 384L	0.1 to 13 cm

Electrode Material

Model 384	Brass
Model 384L	Stainless Steel

Compatibility:

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

APPENDIX B: REPLACEMENT PARTS

Order No.	Model	Description
45-0101	384	Caliper Electrode, Brass 1 x 1 cm Electrodes
45-0102	384L	Caliper Electrode, Stainless Steel, 1.5 x 1.5 cm & 2.0 x 2.0 cm Electrodes
45-0059	VIP3000SC	The Enhancer 3000® Monitoring System

APPENDIX C: MAINTENANCE

Do not attempt maintenance while the Caliper Electrode is connected to a pulse generator.

Clean the Caliper end-plates between experiments by washing with a mild detergent using a cloth or soft bristled brush. Rinse off detergent with de-ionized water and sterilize with ethanol of necessary.

Clean the Calipers with a soft cloth or tissue. If necessary, moisten the cloth or tissue with a dilute detergent solution.

APPENDIX D: TROUBLESHOOTING

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

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84 October Hill Road
Holliston, MA 01746-1388 U.S.A.
Toll Free: 1-800-272-2775 (US only)
Phone: 1-508-893-8999
Fax: 1-508-429-5732
E-mail: techsupport.btx@harvardapparatus.com
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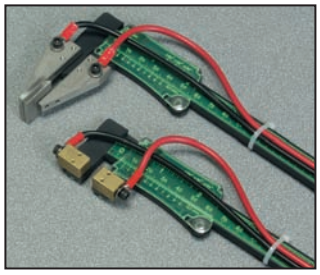

Caliper Electrodes

CAUTION
FOR RESEARCH USE ONLY
NOT FOR CLINICAL USE ON PATIENTS

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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