



STX100 Series

*Electrodes for cell culture inserts used in
High Throughput Screening (HTS)*



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INSTRUCTION MANUAL

Serial No. _____

111302

WARRANTY

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

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sterilization temperatures, a full evaluation of this procedure on the performance of the STX100 has not as yet been completed. The electrode may be sterilized using alcohol (one of the most common methods), ethylene oxide, UV, or a bactericide (e.g., Cidex Plus [WPI #7364] or Sporicidin).

A Typical Sterilization Protocol Using Alcohol:

WARNING: Do not leave the electrode in alcohol for more than 30 minutes. Continuously soaking the electrode in alcohol will weaken the protective coating on the electrode and shorten its lifetime.

In a laminar flow hood:

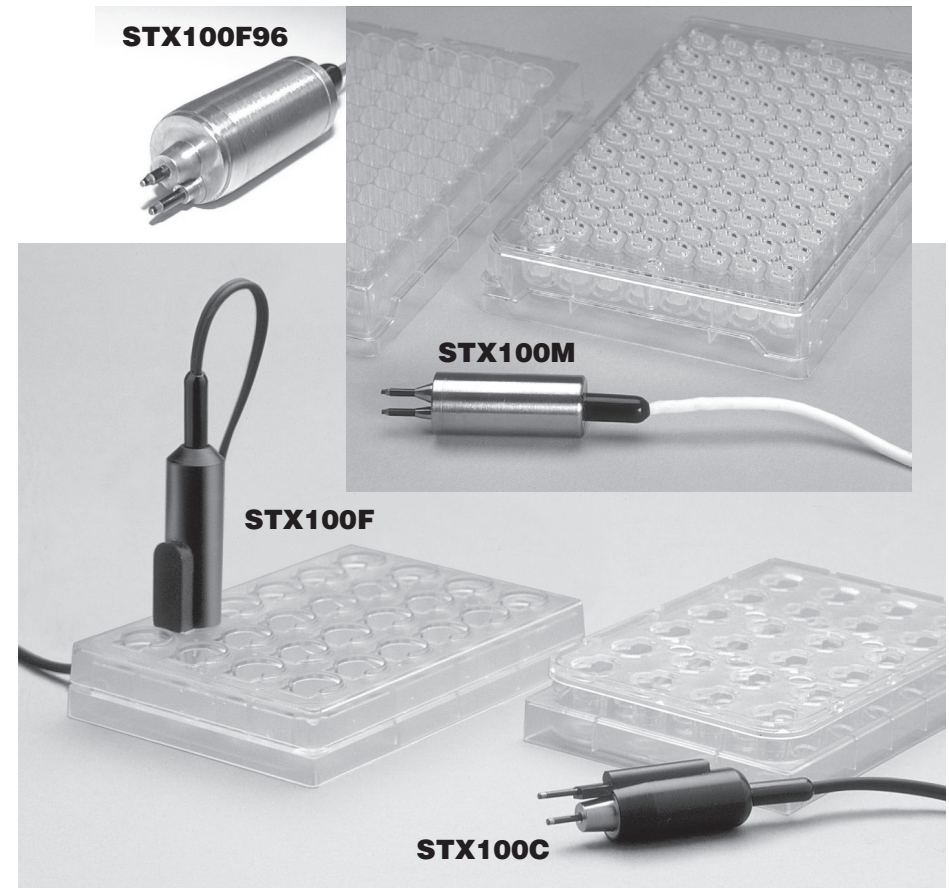
1. Immerse the electrode in 70% ethanol for 15 minutes. Allow it to air dry for 15 seconds.
2. Rinse the electrode in a sterile electrolyte solution similar to the experimental cell culture medium or in 0.1 M KCl or 0.15 M NaCl solution.
3. The electrode is now ready to use.

The electrode can be left in the UV hood to keep it sterile.

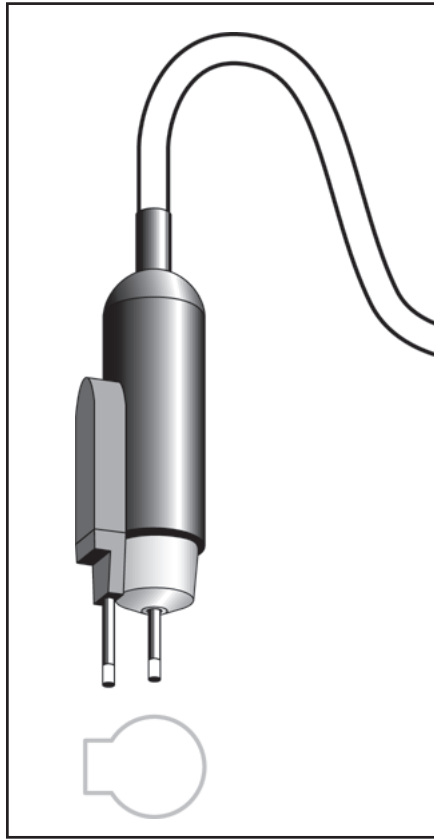
NOTE: When the electrode is exposed to strong visible or UV light, a dark colored oxide film will slowly form on the electrode surface. This film normally will not affect the performance of the electrode. To avoid the formation of the film, shield the electrode from strong light.

STORAGE OF THE ELECTRODE

The STX100 should be rinsed with distilled water and stored dry and in the dark.



The **STX100** is a new miniature electrode designed for measurement of transepithelial electrical resistance (TEER) in high throughput screening (HTS) cell culture plates in combination with WPI's **EVOMX**. The STX100 exhibits nearly the same reproducibility for tissue resistance measurements ($< \pm 5 \Omega$) as do WPI's **Endohm** chambers. It also has the advantage of being able to perform resistance measurements directly in an HTS plate, common or divided, thus reducing the possibility of contamination as well as mechanical damage to the cultured cells. The STX100 employs a specially shaped adapter that fits precisely to each manufacturer's plate. This ensures the same electrode position every time the electrode is inserted into a well, significantly improving reproducibility over hand-held or manually placed electrodes. Another important feature is the miniaturization of the electrode, only 1.5 mm in diameter, yet stronger and more durable than the standard STX2 electrode included with the EVOMX.



Two STX100 models are designed for specific HTS plates:

STX100C is specifically designed for Corning Costar HTS Transwell-24.

STX100F is specifically designed for the BD Falcon HTS Multiwell insert system.

STX100F96 is specifically designed for the BD Falcon HTS 96-Multiwell insert system.

STX100M is specifically designed for Millipore's new 96-well Multiscreen™ cell culture filter system.

NOTE: The STX100C, STX100F, STX100F96 and STX100M are not interchangeable!

Although the STX100 was developed to meet the demands of the pharmaceutical industry's HTS protocols, it is also a useful tool for the academic research scientist

who requires precision, reproducibility, decreased exposure to contamination and minimal disturbance to cells. An example of such application might be the long term study of TEER changes due to chemical or other factors.

INSTRUCTIONS FOR USE

TEER Measurement

The STX100 is designed to be used with WPI's **EVOMX** meter (although the EVOM or Millipore ERS meter can also be used). The electrode is connected to the meter in the same way as the STX2 electrode supplied with the meter. Refer to the EVOM manual for additional instructions. For TEER measurement, the electrode does not need preconditioning before the measurement. The measurement can be done either in a common or divided tray. However, the reading might be more reproducible (± 3 ohm instead of ± 5 ohm) when measurement is done in the divided tray. This is because the larger expanse of the common tray and flexibility of the insert plate makes the insertion height of the electrode fluctuate slightly each time the plate is pushed.

1. Sterilize the electrode, if desired (See Sterilization under Maintenance for detailed instructions).
2. To perform the measurement, place the STX100 so that the shorter electrode is in the center of the insert and the slightly longer electrode is outside of the insert. (In the case of the STX100M and STX100F96, the electrode with the wider base goes in the center and the electrodes are lined up with the help of marks on the top end of the stainless steel holder.) Let the electrode sit by its own weight on top of the keyhole-shaped insert when taking the TEER reading. Holding the electrode by hand during the measurement can cause error due to even slight movement of the electrode.
3. A blank insert containing electrolyte (*e.g.*, cell culture media), but no cells, should be measured. This blank reading should be subtracted from the final reading. See additional discussions on resistance readings and calculations in the EVOM manual. Note that blank readings made in the common tray and divided tray might be different.

MAINTENANCE OF THE STX100 ELECTRODE

Cleaning

After using the electrode, it should be rinsed with distilled water and dried with a soft cloth or tissue.

With use, the electrode surface could become coated with foreign materials. This build-up, or contamination, will degrade the performance of the system. If the meter readings become less stable, the electrode can be cleaned as follows:

1. Soak the electrode in 1 N HCl for five minutes.
2. Next soak the electrode in undiluted bleach for five minutes.

CAUTION: Do not let the HCl or bleach come in contact with the stainless steel component of the electrode holder.

3. Rinse the electrode thoroughly with distilled water after this treatment to remove any corrosive fluid remaining.

Sterilization

The STX100 electrodes are non-sterile as supplied. The electrode cannot be sterilized by autoclaving. Although all of the material used in the electrode can withstand