# Electro-Blotter System

Installation and Operation Manual

**Version 1.1**

Item# 01120

***This instrument is intended for laboratory use only***

# Index

# A. Important Notice

Before setting up and operating the Electro-Blotter System (E-Blotter), please carefully read these instructions to get familiarized with the installation and operation process. Instructions should be read by experienced individuals before operating the instruments.

Any improper usage of the instrument may cause damage. Please refer to the safety notice included with this equipment.

The instrument shall not be modified or altered in any way. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazard. Wealtec is not responsible for any injury or damage caused by using the instrument for any non-intended purpose or injury as a result of modification of the instrument by any person who is not authorized by Wealtec Corp.

## A-1. Warranty

Electro-Blotter System (E-Blotter) is warranted to be free from defects in materials or workmanship for a period of one year from the original invoice date, under normal usage. Any defects occurring during warranty period, Wealtec Corp. will repair or replace defective products or parts without charge unless the defects arise from conditions outlined below. The defects described below are specially excluded from Wealtec warranty policy.

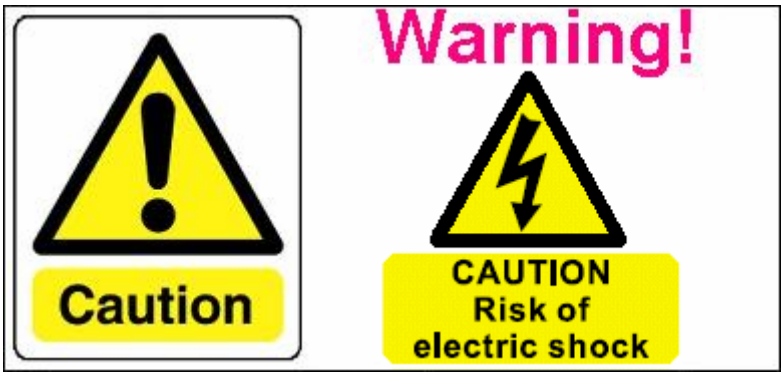
1. Improper operation of the instrument.
2. Repair or modification by any person who is not authorized by Wealtec Corp.
3. Damage caused by any (in)-direct accident, neglect or misuse.
4. Damage caused by disaster.
5. Damage caused by any improper solvents or samples

## A-2. Technical and Service Contact

Most of the operation details are described in this instruction manual to assist and guide operator for an appropriate solution. For any other technical/service questions, please contact your local representative or contact Wealtec international technical/service specialist by E-mail: support@wealtec.com.

# A-3. Safety Notice

## A-3-1. Safety Information




- Do not connect power supply or electricity to E-Blotter system without attaching the cover of the safety-lid. Risk of electric shock to the operator might occur without upper-lid (safety-lid) cover protection.
- Before removing the upper-lid (safety-lid), turn off the power supply and disconnect the black and red electrode-cables.
- Abrasive or high alkaline cleaners may erode the surface protection coating of E-Blotter system. Do not use abrasive or high alkaline cleaners.
- Do not autoclave or boil any parts of E-Blotter system.
- Do not soak / immerse upper-lid (safety-lid) in water or any solvent.
- Exposing the unit to organic solvents like alcohol, chlorinated hydrocarbons and aromatic hydrocarbons will cause damage to the acrylic material of the E-Blotter system.
- The E-Blotter system may be damaged when exposed or operated at temperature over 80℃.
- E-Blotter system should be operated with DC electrophoresis power supply which is isolated from external ground. The maximum electrical limitation of E-Blotter system are:
    - Maximum voltage: 700 V
    - Maximum current: 500 mA
- E-Blotter system is only intended for vertical electrophoresis usage. Do not use E-Blotter system in any other unintended purpose.
- Wear protective gloves, safety glasses and appropriate clothing when operating E-Blotter.

# B. Introduction

E-Blotter is a gel transfer apparatus, which includes an electrophoresis tank, one E-Blotter cassette holder and two electrode cassette/plate assembly. The system allows transferring two gels simultaneously. E-Blotter is applicable for SDS-PAGE and nucleic acid gels. Wealtec ELITE Power Supply Series is compatible and it is recommended to use as a power source to run the E-Blotter system.

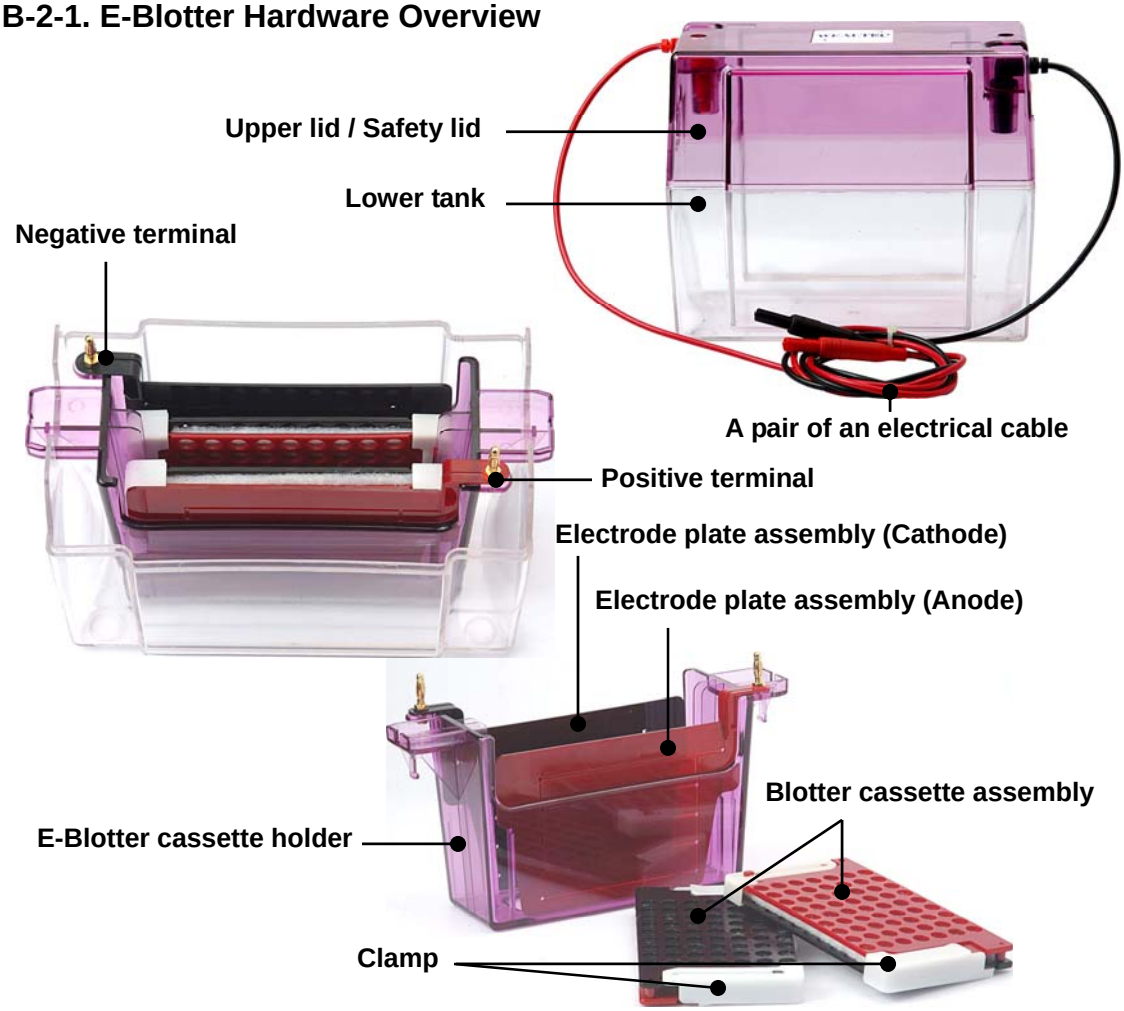
## B-1. Specifications

### B-1-1. E-Blotter system

| | |
|---|---|
| Transfer gel size (W x H) | 11 x 7.5 (cm) |
| Sponge size (W x H) | 11 x 7.5 (cm) |
| Transfer gel capacity | 1 or 2 gels |
| E-Blotter module capacity | Single set (Two electrode cassette) |
| Buffer requirement | 1450 (ml) |
| E-Blotter tank dimension (L x W x H) | 20 x 13 x 16.5 (cm) |
| E-Blotter module dimension (L x W x H) | 22 x 6.8 x 11 (cm) |
| Electrode cassette dimension (L x W x H) | 14 x 1.1 x 7.7 (cm) |
| Cathode to Anode distance | 5 cm |
| Weight<br>(Buffer reservoir, lid, E-Blotter module) | 350g |
| Warranty | 1 year |
| **Operating conditions** | Temperature : 0-60℃<br>Humidity: 10% to 90% R.H.<br>Non-condensing |
| **Recommended power supply** | ELITE 200, ELITE 300 or 300 PLUS and Mini-ELITE |

# B-2. Product Descriptions

## B-2-1. E-Blotter Hardware Overview




### Electrophoresis tank

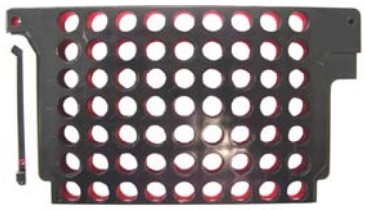
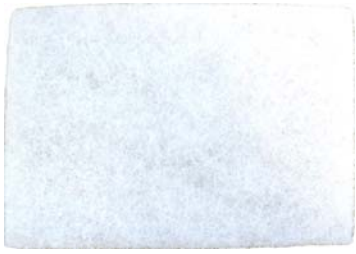
Electrophoresis tank consists of an acrylic lower-tank, an upper-lid, and a pair of electrode cables (Black and red). The lower-tank can hold sufficient buffer to passively cool down the temperature of the system. The safety-lid prevents users from the risk of electric shock. Furthermore, with fixed black and red electrode cables and uni-direction design, the lid minimizes user mistake with electrode direction or with the right operation orientation.

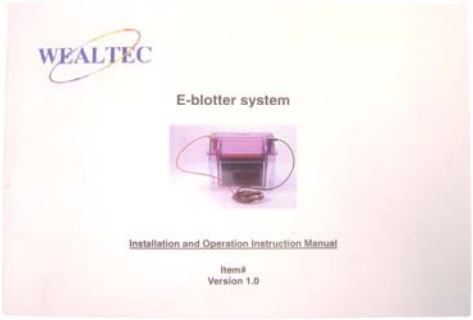
### E-Blotter module

E-Blotter module consists of an E-Blotter cassette holder, electrode plate assembly – anode & cathode (banana-plugs (black and red), platinum electrode wire with silicone tubes), two E-Blotter cassettes (Black cassette, red cassette and two clamps per set). The combination of banana-plugs and platinum electrode wire allows generating an even electric field distribution. E-Blotter allows transferring up to two gels at a time.

# C. Installation of Electro-Blotter System (E-Blotter)

## C-1. Package List

| Item | Quantity |
|---|---|
| **Electrophoresis tank**  | 1 |
| **Complete E-Blotter cassette holder**  | 1 |
| **E-Blotter cassette assembly**  | 2 |
| **Blotting sponge**  | 4 |

| | |
|---|---|
| **Blotting paper / filter**  | 50 |
| **Operation and instruction manual**   | 1 |

## C-2. Installation of E-Blotter

1. Unpack the package and remove the E-Blotter unit out of the box. Remove the plastic protection cover from the unit. Use the packing list to ensure the contents of the box are complete.
2. Use water to wash all the parts **except the safety-lid**, and rinse washed parts with de-ionized water to make sure no ionic material remained. Air-dry all parts before the usage.

# D. Operation

## D-1. Standard Operation / E-Blotting protocol

**1.** Prepare the filter paper and the membrane paper as per to the required gel dimension.

**2.** Prepare transfer buffer with reference to the table below.

| **SDS PAGE gels** | | | **Nucleic acid gels** | | |
|---|---|---|---|---|---|
| **Towbin buffer with 10% methanol** | | | **5xTBE bufffer** | | |
| **Components** | **Final concentration** | **Amount** | **Components** | **Final concentration** | **Amount** |
| **Tris base** | **25mM** | **6.055g** | **Tris base** | **450mM Tris-borate** | **108g** |
| **Glycine** | **192mM** | **28.826g** | **Boric acid** | | **55g** |
| **methanol** | **10%** | **200ml** | **EDTA** | **10mM** | **40ml** |
| **ddH2O** | --- | **To 2000ml** | **ddH2O** | --- | **To 2000ml** |

*TBE is usually made and stored as 5X, dilute again the concentrated stock buffer (1X) just before the use.

**3.** Ensure to soak and leave the gel and the membrane paper in the transfer buffer for 15~20min before running an experiment.

**4.** Place the E-Blotter cassette holder in the lower tank (Figure D-1).

**Figure D-1**

**5.** Pour the transfer buffer and fill into the lower tank up to approximately one liter.

**6.** Open the blotter cassette assembly by pulling and releasing the clamp out on both sides

(Figure D-2).

**Figure D-2**

**7.** Compose the transfer sandwich of the cassette assembly accordingly with the right orientation as shown in Figure D-3.

**a.** Dismantle the cassette assembly by pulling and releasing the clamp out on both sides and place them as in 2 pieces (Red plate and black plate)

**b.** First start with the red cassette plate place it in a container box. Place the sponge on the red cassette plate.

**c.** Place the filter on the sponge and pour approximately 5ml transfer buffer on the filter.

**d.** Place the membrane (nitrocellulose, PVDF, etc.) on the filter and pour approximately 5ml transfer buffer on membrane.

**e.** Place the gel on the membrane and pour approximately 5ml transfer buffer on the gel.

**f.** Place the second filter on the gel.

**g.** Place the second sponge on the filter.

**h.** Place the black cassette plate on sponge.

**i.** Gently by pressing the whole transfer sandwich closer, push and lock the clamp on both sides.

**Note:** Avoid creating any bubbles in the entire steps.

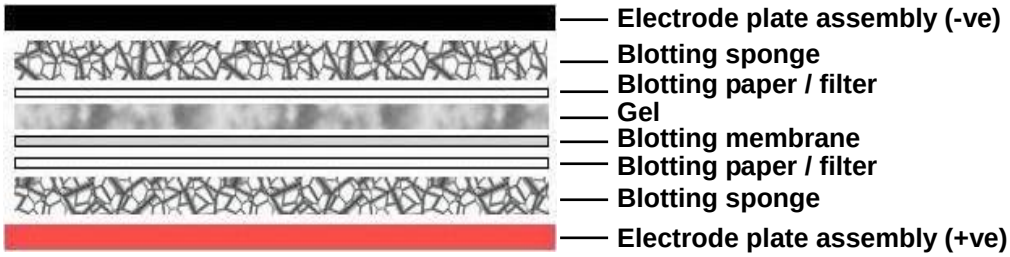



**Figure D-3**

**8.** Gently place the blotter cassette assembly in the E-Blotter cassette holder. (E-Blotter system allows running one or two gels at a time) (Figure D-4).

**Figure D-4**

**9.** While placing the blotter cassette assembly, ensure the clamp on both sides of the blotter cassette assembly facing the top in the E-Blotter cassette holder and the plate of the blotter cassette assembly are facing the correct directions of colors as in red cassette plates of the blotter cassette assembly facing the same direction towards the red electrode plate assembly or black cassette plates of the blotter cassette assembly facing the same direction towards the black electrode plate assembly (Figure D-5).

**Figure D-5**

**10.** Pour the transfer buffer and fill the tank until the buffer covers the entire blotter cassette assembly.

**11.** Close the upper lid (FigureD-6) and connect the E-Blotter system to the power supply (FigureD-7). Start operation: Plug the electrical cable into Elite Power Supply [Red to anode/ ＋, Black to cathode/－] (FigureD-7). Switch on the power supply and setup the desired parameter and the values (Voltage or current) for blotting.

**Figure D-6**

**Figure D-7**


**Note:** The safety-lid is designed to be uni direction therefore it needed to be placed in a right orientation in order to close properly. The safety-lid will not be able to close properly if it is closed or placed in a wrong orientation.

| | SDS PAGE gels | Nucleic acid gels |
|---|---|---|
| **Voltage** | **100V** | **10V** |
| **Timer** | **30min** | **12 hours** |

**Note:** The recommended condition provides at least 94% transfer of the Wealtec proteins visible in the gel with coomassie blue dye and the Wealtec DNA staining with EtBr. The transfer time will be required to be increased for gradient gels or high percentage gel and may be reduced if the sample of interest is low molecular weight.

**12.** 


Stop operation: When blotting is completed, turn off the power supply and remove the electrical cables from the output of the power supply for safety reason. Hold and lift up the safety lid vertically towards upward.

**13.** Remove blotter cassette assembly from the E-Blotter cassette holder. Disassemble and remove the membrane of the blotter cassette assembly. The membrane is now ready for image capturing and analysis.

**14.** A special technique is needed to remove the E-Blotter cassette holder from the lower tank. Before lifting up vertically, slightly move the E-Blotter cassette holder either to right or to left horizontally (tolerance about few mm). Then lift up only one of the edge accordingly to the horizontal movement (If it was moved to the right then the right edge should be lifted else vice versa) to about 1 inch then slightly move the E-Blotter cassette holder towards the opposite direction of the first horizontal movement (If initially the cassette holder was moved horizontally to the right therefore now it should be moved to the left and vice versa) and this will release the cassette holder from e-blotter and it can be removed vertically (FigureD-8(a)~D-8(c) & D-10 or FigureD-9(a)~D-9(c) & D-10).

**Figure D-8(a)**

**Figure D-9(a)**

**Figure D-8(b)**

**Figure D-9(b)**

Figure D-8(c)

Figure D-9(c)

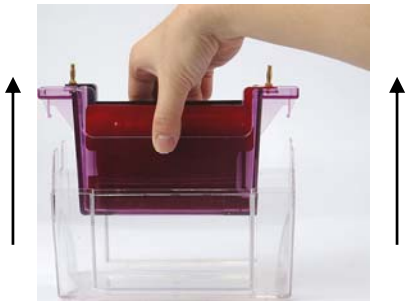


**Figure D-10**

**15.** A large amount of transfer buffer in the lower tank to dissipate heat is required for less than one hour transfer application. When a precise temperature control or long transfer (More than one hour) at high voltage condition is required, we strongly recommend running the experiment in the cold room.

**16.** If overnight transfer at low voltages are ineffective for your application, and higher voltages are necessary, then we strongly recommend the transfer time to be adjusted to a shorter length.

# E. Care and Maintenance

- All E-Blotter system parts **except the upper lid** should be washed with clean water to avoid all possible contaminations and damages to the instruments. Organic solvents or strong detergents may damage the instrument and should not be used.

- Soft sponge is recommended to clean the lower tank. Do not use hard tissues to wipe the surface of the E-Blotter.

- Rinse the tank and plates with de-ionized water to ensure no ionic material remains or presents.

- Avoid washing or immersing the upper lid in water because this will damage the electrode terminals and cables. The electrodes should be protected from all possible moisture, organic solvents and detergents. Clean the upper lid with pre-moistened soft tissue soaked with clean water if necessary.

- Air-dry all the E-Blotter parts before the usage.

# F. References

**1.** J.Sambrook and D. W. Russell, Molecular Cloning A Laboratory Manual, 3rd Edition, 2001.

**2.** Towbin, H., Staehelin, T. and Gordon, J., Electrophoretic transfer of proteins from polyacrylamide gels to nitrocellulose sheets: procedure and some applications. Proc. Natl. Acad. Sci. USA. 76, 4350-4354(1979).

**3.** Bjerrum, O.J., and Schafer-Nielson. (1986) in *Electrophoresis 1986* (Dunn, M. J., ed), pp. 315–327, VCH Publishers Inc., Deerfield Beach, Florida.

# G. Order Information

## E-Blotter System

| Item # | Description |
|---|---|
| 1030201 | E-Blotter complete system, includes electrophoresis tank, E-Blotter module and an instruction manual |

## E-Blotter Module

| Item # | Description |
|---|---|
| 1031004 | E-Blotter module, includes complete E-Blotter cassette holder with black and red electrode plate assembly, blotter cassette assembly/2pcs, blotting sponge/4pcs and blotting paper/50pcs without tank. |

## V-GES with E-Blotter System

| Item # | Description |
|---|---|
| 1030001 | V-GES with E-Blotter complete system, system includes V-GES (0.5mm) complete system and E-Blotter module. |
| 1030002 | V-GES with E-Blotter complete system, system includes V-GES (0.75mm) complete system and E-Blotter module. |
| 1030003 | V-GES with E-Blotter complete system, system includes V-GES (1.0mm) complete system and E-Blotter module. |

## V-GES / E-Blotter Electrophoresis Tank

| Item # | Description |
|---|---|
| 1031001 | V-GES / E-Blotter electrophoresis tank |
| 1035001 | V-GES / E-Blotter lower tank with four rubber feet |
| 1035002 | V-GES / E-Blotter upper lid with electrical cable |

## E-Blotter System with Power Supply

| Item # | Description |
|---|---|
| 1030211 | E-Blotter complete system with power supply (120V), system includes electrophoresis tank, E-Blotter module, an instruction manual and ELITE 300 plus power supply (120V – 50/60Hz). |

| | |
|---|---|
| 1030212 | E-Blotter complete system with power supply (230V), system includes electrophoresis tank, E-Blotter module, an instruction manual and ELITE 300 plus power supply (230V – 50/60Hz). |
| 1030213 | E-Blotter complete system with power supply (120V), system includes electrophoresis tank, E-Blotter module, an instruction manual and ELITE 200 power supply (120V – 50/60Hz). |
| 1030214 | E-Blotter complete system with power supply (230V), system includes electrophoresis tank, E-Blotter module, an instruction manual and ELITE 200 power supply (230V – 50/60Hz). |

## V-GES with E-Blotter System and Power Supply

| Item # | Description |
|---|---|
| 1030011 | V-GES with E-Blotter complete system, system includes V-GES (0.5mm) complete system, E-Blotter module and ELITE 300 Plus power supply (120V – 50/60Hz). |
| 1030012 | V-GES with E-Blotter complete system, system includes V-GES (0.5mm) complete system, E-Blotter module and ELITE 300 Plus power supply (230V – 50/60Hz). |
| 1030013 | V-GES with E-Blotter complete system, system includes V-GES (0.75mm) complete system, E-Blotter module and ELITE 300 Plus power supply (120V – 50/60Hz). |
| 1030014 | V-GES with E-Blotter complete system, system includes V-GES (0.75mm) complete system, E-Blotter module and ELITE 300 Plus power supply (230V – 50/60Hz). |
| 1030015 | V-GES with E-Blotter complete system, system includes V-GES (1.0mm) complete system, E-Blotter module and ELITE 300 Plus power supply (120V – 50/60Hz). |
| 1030016 | V-GES with E-Blotter complete system, system includes V-GES (1.0mm) complete system, E-Blotter module and ELITE 300 Plus power supply (230V – 50/60Hz). |

## V-GES Accessories – Glass Plate

| Item # | Description |
|---|---|
| 1035101 | E-Blotter cassette holder without electrode plate assembly |
| 1035102 | E-Blotter red electrode plate assembly (Anode) |
| 1035103 | E-Blotter black electrode plate assembly (Cathode) |
| 1035104 | E-Blotter cassette assembly/2pcs and blotting sponge (110 x 75)mm /4pcs |
| 1035105 | Blotting sponge (110 x 75)mm /4pcs |
| 1035106 | Blotting paper (110 x 75)mm /50pcs |

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