Wealtec Corp.

YRDIMES

Semidry Transfer System

Operation & Instruction Manual

Version 1.1
Item #02020

This instrument is intended for laboratory use only.

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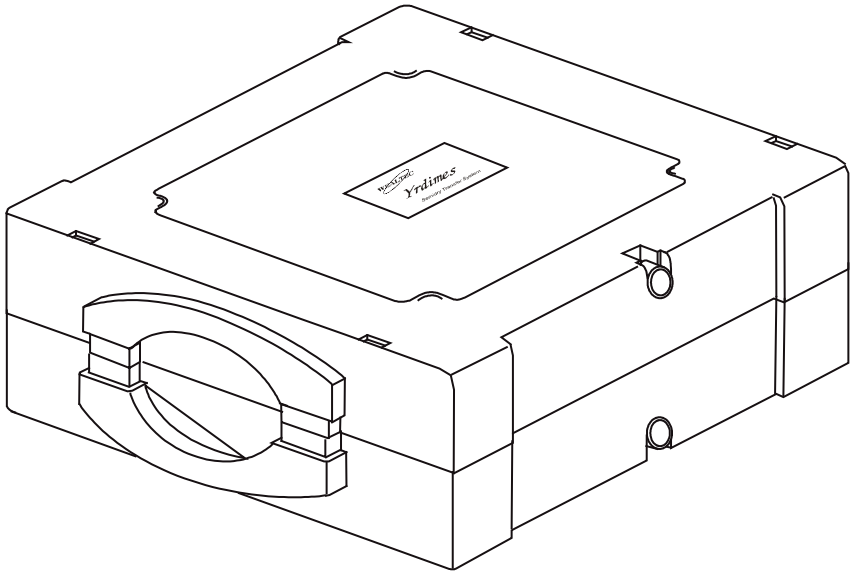
YRDIMES



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Section 1

General information

1.1 Introduction

Yrdimes (patent pending) introduced horizontal semidry electroblotting, in which the transfer takes place in a stack of buffer-saturated filter papers, inserted between two plate electrodes, platinum-coated titanium and stainless steel. The powerful of plate electrodes yield essentially homogenous electrical fields, even when they are moved close together.

The major advantages of Yrdimes electroblotting are: simply assembly reduced buffer consumption, uniform electrical field, high transfer efficiency, time saving, and multiple gels blotting. Well-designed Yrdimes also offers innovative features: able to perform nucleic acid and protein transfers, spring design for homogenous force, light, small and safety.

Historical events

Year	Inventor	Event
1975	Southern (1)	Transfer technique of DNA from agarose gel to nitrocellulose membrane
1979	Towbin (2)	Introduced electroblotting technique
1981	Vaessen (3)	Who first to experiment with plate electrodes for electroblotting
1984	Kyse-Andersen (4)	Introduced horizontal semidry electroblotting

1.2 Safety

Caution, risk of electrical shock

Caution

Yrdimes is certified to meet CE safety standards.

Before operating the unit, examine carefully the following:

1. There are any cracks or defects.
2. Plate electrodes are not corroded or scraped.
3. Electrical cables are not charred.
4. Door-locks are not damaged.

If any parts or components have the above-mentioned hazard, do not use it and immediately contact your local representative.

Once the unit is examined, without any damage or defect, carefully read the entire manual and following guidelines before beginning to operate.

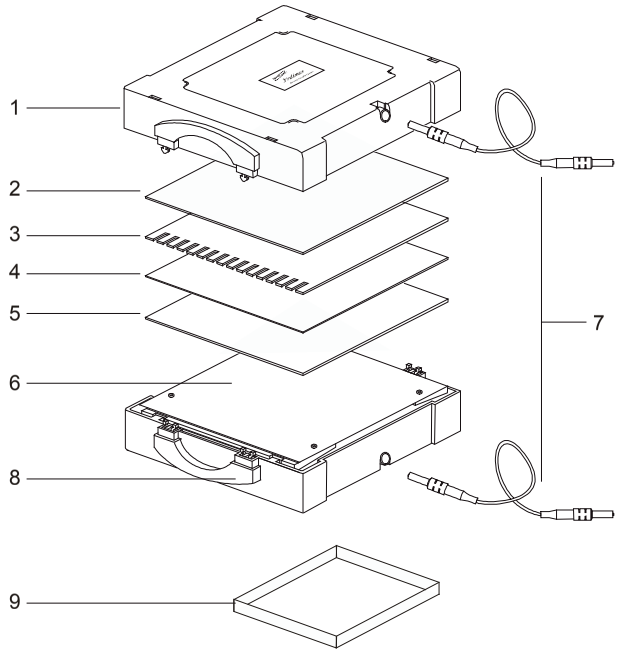
1. Unless otherwise indicated, do not modify or alter the unit, in any way or occasion.
2. Use appropriate power supply. The recommended power supply is ELITE 200.
3. Use the electrical cables available in the package. Do not use any other electrical cables. This could damage the unit and power supply and harmful for the operator.
4. Do not operate higher than 25V with this unit. This could result damage to the electrodes.
5. The anode is platinum-coated titanium plate, whereas the cathode is a stainless steel plate. Do not reverse polarity. Stainless steel does not resist anodic oxidation.
6. Avoid operation at ambient temperature higher than 50℃.
7. Under the constant current condition selected, the voltage will increase during the operation. Therefore, it is not recommended for long operation more than 2 hour.
8. The pH of the buffer chosen will determine the correct orientation of the electrodes relative to the gel/filter interface. Thus, carefully follow the instructions of transfer buffer to be used for.
9. Use gel-protection frame for DNA and RNA application. Otherwise, gel crashed might occur.

Note: For laboratory and indoor use only.

1.3 System components

All components see figure 1.

Item	Quantity	Description
Upper-lid/ platinum-coated titanium plate electrode (anode)	1	Plate electrode dimension 202x205mm
Gel-protection frame	1	19 x 19 cm
Lower-base/stainless steel plate electrode (cathode)	1	Plate electrode dimension 202x205mm
Electrical cables	2	Red and black
Warranty card	1	One year warranty
Instruction manual	1	
Adapters	2	Red and black
BP-C extra-pure blotting papers	1	15 x 15 cm



1.Upper-Lid / spring-loaded cathode plate electrode.
2.Filter paper.
3.Gel.
4.blotting Membrane.
5.Filter paper.
6.Spring-Loaded anode plate electrode.
7.Electrical cable.
8.Lower-Base.
9.Gel-support frame.

Section 2

Operating instructions

Protein blotting

Wear disposable plastic gloves throughout to avoid contaminating the gel or blotting matrix with skin proteins.

2.1 Protein electroblotting preparation

1. Transfer buffer system

   Unless otherwise indicated, all buffers are prepared from analytical grade reagents and are made up in deionized, double-distilled water. Buffer used in semidry electroblotting, especially recommended for this unit, are described by Bjerrum and Schafer-Nielsen (5), with transfer efficiency equal to the efficiency of the discontinuous buffer system of Kyse-Andersen (4) and Svoboda et al. (6)

Table 1. Bjerrum and Schafer-Nielsen buffer system (per liter)

Composition	Concentration
Tris	48 mM
Glycine	39 mM
SDS	1.3 mM
Methanol	20%

Adjust the volume to 1 liter with deionized double-distilled water. pH 9.2. Do not adjust pH with acid or base or conductivity of buffer will be altered.

The buffer is typically of Bjerrum and Schafer-Nielsen system, but there are another varieties according to the nature of the gel and the proteins being analyzed, the blotting matrix being used and the detection method to be employed.

Table 2. Towbin buffer system (per liter) (2)

Composition	Concentration
Tris	25 mM
Glycine	192 mM
Methanol	20%

Adjust the volume to 1 liter with deionized double-distilled water. pH 8.3. Do not adjust pH with acid or base or conductivity of buffer will be altered.

Table 3. Dunn buffer system (per liter) (7)

Composition	Concentration
$NaHCO_3$	10 mM
Na_2CO_3 (anhydrous)	3 mM
Methanol	20%

Adjust the volume to 1 liter with deionized double-distilled water. pH 9.9. Do not adjust pH with acid or base or conductivity of buffer will be altered.

2. After electrophoresis, place the gels onto a reservoir filled with transfer buffer and begin to equilibrate for 5 min.
3. Trim the blotting membrane and pieces of filter paper to the size of the gel and soak these in transfer buffer. In order to prevent air bubbles trapping, gently soaking is necessary. Pretreatment methods of the blotting membrane please refer to its instruction manual.

Note: Uneven wetting of blotting membrane and filter paper frequently affects the efficiency of transfer.
For optimal flow of current, passing only through the gel, do not trim the blotting membrane and filter paper larger than the gel.
Total sandwich (filter papers, blotting membrane and gel) thickness should be up to 1 cm.

4. It is not recommended for stacking up to four gels on top of each other, transfer efficiency gradually decreased toward the cathode, however. It's better to place the gels side-by-side.

Note: for stacking several gels on top of each other, dialysis membranes must be interleaved to avoid contamination of the gels and blotting membrane with substances being transferred from other gels.
Use appropriate molecular weight cutoff and should be soaked in transfer buffer.

2.2 Protein electroblotting method for Yrdimes

1. Simultaneously press down once the right and left handled-side to spring upper-lid, and place it with plate electrode upwardly.
2. Three pieces of buffer-saturated thick BP-C paper are put on the plate electrode of lower-base, and exclude all air bubbles.
The area of plate electrode could be placed 4 standard-size of mini gels (10 x 8 cm) side-by-side.

3. Layer the pre-wetted blotting membrane on the BP-C papers and remove all air bubbles.
4. Doing this step carefully. Place the equilibrated gel on the blotting membrane; ensure the gel is not surpassing the contour of the blotting membrane, then exclude all air bubbles.
5. Cover the gel with the three other pieces of buffer-saturated BP-C papers.
6. As the transfer sandwich is assembled, it is vital that no air bubbles are trapped between either the BP-C papers or the gel, otherwise an uneven transfer will result.
7. To close the unit, line up first the outlet, the wall-side of the unit and then door-locks.
8. Simultaneously press down once the right and left handled-side to latch upper-lid and lower-base firmly.
9. Plug correctly the electrical cables to the unit: red to red (anode) and black to black (cathode). Then connect to an appropriate power supply.

2.3 Protein electroblotting

1. Once the unit is correctly connected to a power supply, start the transfer by turn the power supply on.
2. The transfer is recommended performed at:

   1 or 0.8 mA/cm^2 for 30~40 min

   current limit 5 mA/cm^2 for mini gels and 3 mA/cm^2 for full-size gels

3. After the transfer is finished, turn the power supply off, and unplug the electrical cables from the power supply and the unit.
4. Simultaneously press down once the right and left handled-side to spring upper-lid, and place it with plate electrode upwardly.
5. The blotting membrane is then ready for further analysis.

Nucleic acid blotting

Wear disposable plastic gloves throughout to avoid contaminating the gel or blotting membrane.

2.4 DNA or RNA electroblotting preparation

1. Transfer buffer system

   Unless otherwise indicated, all buffers are prepared from analytical grade reagents and are made up in deionized, double-distilled water. Buffer used is 0.5x TBE.

Table 4. 10x TBE (per liter)

Composition	Concentration
Tris-base	108 g
Boric acid	55 g
EDTA	40 ml 0.5 M, pH 8.0

Adjust the volume to 1 liter with deionized double-distilled water. pH 8.3.

2. After electrophoresis, equilibrate the gel with 0.5x TBE.
3. Trim the blotting membrane and pieces of filter paper to the size of the gel and soak these in transfer buffer. In order to prevent air bubbles trapping, gently soaking is necessary. Pretreatment methods of the blotting membrane please refer to its instruction manual.

Note: Uneven wetting of blotting membrane and filter paper frequently affects the efficiency of transfer. For optimal flow of current, passing only through the gel, do not trim the blotting membrane and filter paper larger than the gel.

2.5 DNA or RNA electroblotting for Yrdimes

1. Simultaneously press down once the right and left handled-side to spring upper-lid, and place it with plate

electrode upwardly.

2. Three pieces of buffer-saturated thick BP-C paper are put on the plate electrode of lower-base, and exclude all air bubbles.

   Note: the gel thickness should be up to 8 mm, otherwise adds more filter papers to keep sandwich thickness up to 1cm.

3. Layer the pre-wetted blotting membrane on the BP-C papers and remove all air bubbles.
4. Doing this step carefully. Place the equilibrated gel on the blotting membrane; ensure the gel is not surpassing the contour of the blotting membrane, then exclude all air bubbles.
5. Cover the gel with the three other pieces of buffer-saturated BP-C papers.
6. As the transfer sandwich is assembled, it is vital that no air bubbles are trapped between either the BP-C papers or the gel, otherwise an uneven transfer will result.
7. Place the gel-support frame.
8. To close the unit, line up first the outlet, the wall-side of the unit and then door-locks.
9. Simultaneously press down once the right and left handled-side to latch upper-lid and lower-base firmly.
10. Plug correctly the electrical cables to the unit: red to red (anode) and black to black (cathode). Then connect to an appropriate power supply.

2.6 DNA or RNA electroblotting

1. Once the unit is correctly connected to a power supply, start the transfer by turn the power supply on.
2. The transfer is recommended performed at:

   3 mA/cm^2 for 30~35 min

   current limit 6 mA/cm^2
3. After the transfer is finished, turn the power supply off; unplug the electrical cables from the power supply and the unit.
4. Simultaneously press down once the right and left handled-side to spring upper-lid, and place it with plate electrode upwardly.
5. The blotting membrane is then ready for further analysis.

   Note: following transfer, fix the DNA or RNA properly.

Section 3

Care and maintenance

3.1 Cleaning

Item	Action
Unit	Washed only with water. No detergent or other cleaner. Wipe the unit with soft cloth or air dry.
Corroded and rusted stainless steel plate electrode	Clean with a mild abrasive cleaner

Note: it is not recommended to take apart any parts of the unit.

3.2 Warning

1. Do not exceed 25V with this unit.
2. Do not scrape the plate electrodes
3. Do not autoclave.
4. Unless otherwise indicated, do not reverse the polarity.

3.3 Maintenance

Item	Damage	Action
Electrical cable	Breaks or cracks	Replace
Plate electrodes	Scraped	Replace
Spring	Lose springiness	Replace
Upper-lid	Damaged	Replace
Lower-base	Damaged	Replace
Door-lock	Damaged	Replace

Troubleshooting

Fault	Cause	Remedies
Poor transfer efficiency		
Protein	Gel percentage is to high	Reduce %T or %C
	Filter paper dry out	Use thicker or increase the number of piece filter paper. Absolutely saturate with buffer
	Incorrect charge to mass ratio	Change buffer system to more acidic or basic
		Increase transfer time
	Short transfer time	Remove air bubbles
Nucleic acid	Sandwich assembly are not completely contacted	Choose an appropriate blotting membrane
	Fault blotting membrane selected	

	The gel is too hot	Remake the transfer buffer
Miss patterns		
Protein	Air bubbles present	Exclude all air bubbles
	Poor gel equilibration	Increase equilibration time
	Sandwich assembly are not completely contacted	Remove air bubbles and excess transfer buffer
Diffuse patterns		
Protein	High power conditions	Reduce voltage Check buffer composition
Nucleic acid	The gel may be too hot	Remake the transfer buffer

Product information

Item #	Product description
1073003	Yrdimes semidry transfer unit
1073001	Yrdimes semidry transfer system, 110 V (include ELITE 200 power supply)
1073002	Yrdimes semidry transfer system, 220 V (include ELITE 200 power supply)
2077802	SurBind N Plus, nylon membrane with positive charge, 30 cmx3 M
2078302	SurBind N, 0.2 μm, nylon membrane with low charge, 30 cmx3 M
2078802	SurBind N, 0.45 μm, nylon membrane with low charge, 30 cmx3 M
2079302	SurBind P, 0.2 μm, pure nitrocellulose membrane, 30 cmx3 M
2079802	SurBind P, 0.45 μm, pure nitrocellulose membrane, 30 cmx3 M
2081002	SurBind Q, PVDF membrane, 26 cmx3.1 M
2083401	BP-C, extra-pure blotting papers, 15x15 cm, 25 pcs/pkg
1001001	ELITE 200 power supply, 110V/60 HZ
1001002	ELITE 200 power supply, 220V/ 50 HZ
1011001	Mini GES cell complete system. Mini GES cell accompanied with a 6.5x7 cm tray, and a 1.0 mm 10-teeth and a 1.0 mm 15-teeth fixed-height combs.
1011002	GES cell complete system. GES cell accompanied with a 10x15 cm tray, and a 1.0 mm 15-teeth and a 1.0 mm 20-teeth fixed-height combs.

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Warranty Card

THANK YOU FOR ORDERING A WEALTEC PRODUCT.

Wealtec Corp. warrants all Wealtec instruments to be free from defects in design, workmanship, and material under normal use for a period of one year from the date of initial shipment.

This warranty covers all parts and components of the instrument except those normally requiring frequent replacement, such as tubing, gasket, O-rings, etc. Wealtec will not be liable for any personal injury, bodily injury, misuse, improper maintenance, negligence or accident.

This warranty is in lieu of all other warranties, expressed or implied, but not limited to, the implied warranties of merchantability or fitness for a particular purpose.

PLEASE KEEP THE WARRANTY CARD FOR FUTURE USE.

Instrument Model :

Item Number :

Serial Number :

Initial Shipping:

Packager Identification

02020 Printed in Taiwan

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