

U9500 & U2520 Classic Ussing Systems

Ussing/diffusion

The Classic system as designed by H.H. Ussing

The investigation of ionic transport across epithelial cells was greatly facilitated by the development of a chamber system designed by Dr. H. H. Ussing more than 40 years ago. Today this equipment bears his name. The U9500 'Classic' design presented here varies little from Dr. Ussing's original equipment which remains in wide use for the study of electrophysiological properties of epithelial tissues.

A newer design, the U9520 'Classic with Inserts' allows for insertion of cell culture or tissue supports and greatly increases the functionality of the classic Ussing chamber. The low initial cost of the Classic design, coupled with the modest cost of add-on components, makes this system an ideal option for classroom instruction and in-the-field research.

U9500 Classic Ussing System (preamp not included)



The Classic Ussing Chamber Systems

The U9500 and U9520 are complete chamber systems consisting of an Ussing chamber, chamber support stand, circulation reservoir, 3-prong clamp, air/gas fitting kit, and electrode set. Both systems are virtually identical with the difference embodied in the actual chamber.

U9500 'Classic' Ussing Chambers

The U9500 'Classic' chambers are machined from solid acrylic into two halves and have vertical and horizontal ports in each half for connection to the circulation system and for making electrical connections.

The face of one chamber-half is imbedded with sharp stainless-steel pins which mate with corresponding holes in the other chamber-half face. These pins allow for puncturing and positioning of an epithelium membrane within the chamber. Chambers are available in a variety of sizes and pin configurations. In the 'Classic' design, a separate chamber must be purchased for each different desired pin configuration. This is a good choice if you intend to study a single tissue type as the assembly is direct and simple.

U9520 'Classic with Inserts' Ussing Chambers

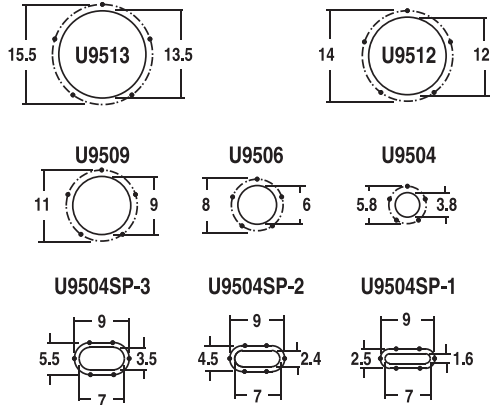
The U9520 'Classic with Inserts' chamber is functionally similar to the U9500 except that it makes use of low-cost adapters (inserts) to position and support tissues or cultured cells within the chamber body. Inserts are interchangeable and permit the researcher to investigate a variety of tissues without having to purchase a separate chamber for each different tissue. The U9520 'Classic with Inserts' chamber is mounted in the standard support stand and procedures for experimentation are the same as with the 'Classic' system.

U9500 & U2520

Classic Ussing Systems (continued)

Ussing/diffusion

Tissue Insert Sizes, Openings and Pin Layouts



*All dimensions in millimeters



Circulation Reservoir



Chamber configurations

U9500 chambers are available with pinned openings in diameters from 3.8 to 13.5 mm and in slot widths from 1.6 to 3.5 mm to accommodate a variety of tissue dimensions. The choice of pin configuration depends on the epithelia under study. The specified diameter designates the main opening to which the buffer makes contact with the membrane.

U9520 chamber inserts are available with openings in diameters from 3.8 to 13.5 mm. Inserts are also available for culture cups from Falcon, Millicell, Snapwell, and Transwell.

Both U9500 and U9520 chambers are available with and without drains.

Circulation Reservoirs, 3 Volumes

Available in 4, 10, and 20 ml capacities (per side), circulation reservoirs are two sided, hand-blown apparatus made from borosilicate glass. Each side has two outlets at the base for connection to the perfusion fittings on the associated Ussing chamber-half. Each side also has a separate air/gas inlet to drive the circulation system. Gas, commonly a 95% O₂/5% CO₂ mixture, is forced under low pressure into these inlets and allowed to come into contact with the buffer solution. The rising bubbles drive circulation and oxygenate the buffer. This method is commonly referred to as a 'gas-lift' perfusion system.

Each horizontal reservoir arm has either an inlet or outlet port for access to the water jacket. Water at the desired temperature is pumped through the jacket and allowing thermoregulation of the perfusion solutions. Glass condensers are provided to minimize evaporative solution losses from the top. Reservoirs are.

Electrode Sets and Agar Bridge Fittings

Each chamber is supplied with a U9975A Electrode Set comprised of 4 electrodes, 2 Ag-AgCl pellet electrodes (for voltage) and 2 Ag wire electrodes (for current). Electrodes include 1 meter (3 feet) of wire and a connector to plug into the amplifier headstage.

Also supplied are Luer taper fittings that screw onto the electrodes to provide an agar salt bridge connection into the chamber. Fittings can be filled with agar either before or after assembly onto the electrodes.

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ussing/diffusion

Classic Ussing Systems (continued)

How To Order:

- **Select Base Assembly with desired reservoir size.** Systems include support stand with rods, circulation reservoir, 3-prong clamp, U9303 Air/Gas Fitting Kit, U9975A Electrode Set, and U9965EP Electrode Bridge Fitting Kit.
- **Select chamber.** Choices are 'Classic' or 'Classic with Insert'. Both available with or without drains.
- Finally, if using 'Classic with Insert', **select desired insert.**

Order #	Model	Product
Base Assembly		
W4 64-0500R4	U95004R	Classic Ussing Base Assembly with 4 ml circulation reservoir
W4 64-0500R10	U950010R	Classic Ussing Base Assembly with 10 ml circulation reservoir
W4 64-0500R20	U950020R	Classic Ussing Base Assembly with 20 ml circulation reservoir

'Classic' Chambers

Without Drains	With Drains			w/o	with
W4 64-0504	W4 64-0512	U9504	'Classic' Chamber with 3.8 mm D round opening		
W4 64-0505	W4 64-0513	U9506	'Classic' Chamber with 6.0 mm D round opening		
W4 64-0506	W4 64-0514	U9509	'Classic' Chamber with 9.0 mm D round opening		
W4 64-0507	W4 64-0515	U9512	'Classic' Chamber with 12.0 mm D round opening		
W4 64-0508	W4 64-0516	U9513	'Classic' Chamber with 13.5 mm D round opening		
W4 64-0509	W4 64-0517	U9504SP-1	'Classic' Chamber with 1.5 x 7.0 mm slotted opening		
W4 64-0510	W4 64-0518	U9504SP-2	'Classic' Chamber with 2.5 x 7.0 mm slotted opening		
W4 64-0511	W4 64-0519	U9504SP-3	'Classic' Chamber with 3.5 x 7.0 mm slotted opening		

'Classic with Insert' Chamber

Without Drains	With Drains		
W4 64-0532	W4-64-0533	U9521	'Classic with Insert' Chamber, no insert

Order #	Model	Product
Chamber Inserts		
Inserts with pins		
W4 64-0539	U9524B-04	3.8 mm Round Insert with 5 Pins
W4 64-0540	U9524B-06	6.0 mm Round Insert with 5 Pins
W4 64-0541	U9524B-09	9.0 mm Round Insert with 5 Pins
W4 64-0542	U9524B-12	12.0 mm Round Insert with 5 Pins
W4 64-0543	U9524B-13	13.5 mm Round Insert with 5 Pins
Inserts with o-rings		
W4 64-0534	U9524A-04	3.8 mm Round Insert with O-Ring
W4 64-0535	U9524A-06	6.0 mm Round Insert with O-Ring
W4 64-0536	U9524A-09	9.0 mm Round Insert with O-Ring
W4 64-0537	U9524A-12	12.0 mm Round Insert with O-Ring
W4 64-0538	U9524A-12	13.5 mm Round Insert with O-Ring
Inserts for culture cups		
W4 64-0549	U9524S	Snapwell™ Adapter
W4 64-0544	U9524F-09	Falcon® Adapter, 9 mm
W4 64-0545	U9524F-12	Falcon® Adapter, 12 mm
W4 64-0546	U9524F-25	Falcon® Adapter, 25 mm
W4 64-0547	U9524M-12	Millicell® Adapter, 12 mm
W4 64-0548	U9524M-30	Millicell® Adapter, 30 mm
W4 64-0550	U9524T-06	Transwell® Adapter, 6.5 mm
W4 64-0551	U9524T-12	Transwell® Adapter, 12 mm
W4 64-0552	U9524T-24	Transwell® Adapter 24 mm

Order #	Model	Product
Accessories and replacement parts		
W4 64-0553	U9565EP	Electrode Bridge Fittings, pkg. of 12, and Adapters, pkg. of 6
W4 64-0554	U9975A	Electrode Set, 2 Ag/AgCl Pellet, 2 Ag Wire
W4 64-0555	U9985	Bridge Fitting Adapters, pkg. of 6
W3 64-0556	U9304	Circulation reservoir, 4 ml total volume
W3 64-0557	U9310	Circulation reservoir, 10 ml total volume
W3 64-0558	U9320	Circulation reservoir, 20 ml total volume
W4 64-0560-4ml	U9302-4	Condenser Set for 4 ml Circulation Reservoir, Set of 2
W4 64-0560-10ml	U9302-10	Condenser Set for 10 ml Circulation Reservoir, Set of 2
W4 64-0560-20ml	U9302-20	Condenser Set for 20 ml Circulation Reservoir, Set of 2
W4 64-0561	U9303	Air/Gas Connection Kit
W4 64-0562	U9403	Support Stand with One Ring Stand Rod
W4 64-0563	U9403R	Ring Stand Rod
W4 64-0564	U9404	3-Prong Clamp
W4 64-0567	SL-6U	Stopcocks with Luer Connectors for U9926 and U2500
W4 64-0165	SL-6	Stopcocks, pkg. of 6