

capillaries



EC1 65-0606 PPS-2 Mini-Frame, see page 12

EC1 72-6048 Just for Mice™
Digital Stereotaxic Instrument,
see page 30



EC1 72-4792 Dual Lab
Standard Stereotaxic
Frame, see page 33



EC1 72-4950 Bone Micro
Drill System, see page 41

Products	Page No.
Capillary Glass	2 - 7
Stimulation & Recording	8 - 19
Microdialysis	20 - 27
Stereotaxic Frames	28 - 38
Slicers/Matrices	39 - 40
Bone Drill	41
Stereotaxic FAQ's	42 - 43



Previous



Next

Section
Table of
Contents

Main
Table of
Contents

Search

WWW
Home

Contact
Us

Premium Capillary Glass



Previous



Next



- Ends are fire polished to prevent damage to the rubber gaskets when inserted into electrode holders
- Glass is also cleaned with deionized water before being packed in dust-free containers

Warner capillary glass is known worldwide for its consistent high quality. The glass is precision drawn to insure reliability and consistency from batch to batch. The full line of glass capillaries listed here is stocked for fast shipment.

Standard Wall/Thin Wall

Tubing is available in two wall thickness, standard wall and thin wall. Additionally, a variety of diameters is offered to cover most needs of micropipette and microelectrode research.

Capillaries with Filament

A small diameter filament is fused to the glass inside diameter to facilitate rapid solution filling through capillary attraction. This is especially important for the very small diameter of sharp electrodes typically used for intracellular studies and microiontophoresis.

Premium Corning Type 7740 (Pyrex)

Corning 7740 Borosilicate is the most commonly used glass in electrode fabrication because of its mechanical strength, chemical durability, electrical resistivity, and its ability to withstand thermal stress. It is also easy to work with and suitable for a wide range of applications. Corning 7740 glass is offered in a choice of diameters, in standard or thin-walled format, and either with or without inner filament; they are additionally available in Theta style. Single barrel glass is available in 3 lengths: 75, 100 and 150 mm. Theta glass is offered in 100 mm lengths only.

Specifications

Composition	81% SiO ₂ , 13% B ₂ O ₃ , 4% Na ₂ O, 2% Al ₂ O ₃
Softening Temp.	821°C
Dielectric Constant	4.6

Premium Standard Wall Borosilicate

Order #	Model	OD mm	ID mm	Length mm	Qty/Pkg
EC1 64-0765	G100-3	1.0	0.58	75	500
EC1 64-0766	G100-4	1.0	0.58	100	500
EC1 64-0770	G120-6	1.2	0.69	150	350
EC1 64-0771	G150-3	1.5	0.86	75	225
EC1 64-0772	G150-4	1.5	0.86	100	225
EC1 64-0773	G150-6	1.5	0.86	150	225
EC1 64-0774	G200-3	2.0	1.16	75	125

Premium Thin Wall Borosilicate

Order #	Model	OD mm	ID mm	Length mm	Qty/Pkg
EC1 64-0777	G100T-3	1.0	0.78	75	500
EC1 64-0778	G100T-4	1.0	0.78	100	500
EC1 64-0780	G120T-3	1.2	0.94	75	350
EC1 64-0781	G120T-4	1.2	0.94	100	350
EC1 64-0783	G150T-3	1.5	1.17	75	225
EC1 64-0784	G150T-4	1.5	1.17	100	225
EC1 64-0785	G150T-6	1.5	1.17	150	225

Premium Standard Wall Borosilicate with Filament

Order #	Model	OD mm	ID mm	Length mm	Qty/Pkg
EC1 64-0786	G100F-3	1.0	0.58	75	500
EC1 64-0787	G100F-4	1.0	0.58	100	500
EC1 64-0788	G100F-6	1.0	0.58	150	500
EC1 64-0789	G120F-3	1.2	0.69	75	350
EC1 64-0790	G120F-4	1.2	0.69	100	350
EC1 64-0791	G120F-6	1.2	0.69	150	350
EC1 64-0792	G150F-3	1.5	0.86	75	225
EC1 64-0793	G150F-4	1.5	0.86	100	225
EC1 64-0794	G150F-6	1.5	0.86	150	225
EC1 64-0795	G200F-3	2.0	1.16	75	125
EC1 64-0796	G200F-4	2.0	1.16	100	125

Premium Thin Wall Borosilicate with Filament

Order #	Model	OD mm	ID mm	Length mm	Qty/Pkg
EC1 64-0798	G100TF-3	1.0	0.78	75	500
EC1 64-0799	G100TF-4	1.0	0.78	100	500
EC1 64-0800	G100TF-6	1.0	0.78	150	500
EC1 64-0801	G120TF-3	1.2	0.94	75	350
EC1 64-0802	G120TF-4	1.2	0.94	100	350
EC1 64-0804	G150TF-3	1.5	1.17	75	225
EC1 64-0805	G150TF-4	1.5	1.17	100	225
EC1 64-0808	G200TF-4	2.0	1.56	100	125

Premium Theta Glass (100 pcs/pkg.)

Order #	Model	OD mm	ID mm	Septum mm	Length mm
EC1 64-0810	TG150-4	1.5	1.0	0.2	100
EC1 64-0811	TG200-4	2.0	1.4	0.2	100

Patch Clamp Glass



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

Choosing patch clamp glass is generally based on noise performance and the ability to form and maintain a seal. No single type of glass works best in all applications and some trial and error is usually required to find the type yielding optimum results in your experiment. Patch glass is manufactured without an inner filament. This glass is offered in both the standard and premium models. The premium glass has fire polished ends and is cleaned with deionized water before being packed in dust-free containers.



Custom 8520 Patch Glass

Now Available in Premium Line!

The custom patch glass from Clark was introduced in 1997 as a substitute for the Corning 7052 glass, a favorite amongst researchers performing patch clamping. Initial tests showed the 8520 glass to be equal to the 7052 in noise performance. More importantly, seals were formed faster and maintained for longer periods.

Specifications

Composition	>10% SiO ₂ , >10% B ₂ O ₃ , >1% Al ₂ O ₃ , >1% K ₂ O, <1% Na ₂ O, <1% Li ₂ O, <1% ZnO, <1% As ₂ O ₃ , <1% TiO ₂ , <1% ZrO ₂
Softening Temperature	720°C
Dielectric Constant	4.6

Premium Custom 8520 Patch Glass

Order #	Model	OD mm	ID mm	Length mm	Qty/Pkg
EC1 64-0817	G85150T-3	1.50	1.16	75	225
EC1 64-0818	G85150T-4	1.50	1.16	100	225
EC1 64-0819	G85165T-3	1.65	1.28	75	190
EC1 64-0820	G85165T-4	1.65	1.28	100	190

Clark Custom 8520 Patch Glass

Order #	OD mm	ID mm	Length mm	Qty.
EC1 30-0091	1.2	0.93	75	350
EC1 30-0089	1.2	0.93	100	350
EC1 30-0090	1.2	0.93	150	350
EC1 30-0094	1.5	1.16	75	225
EC1 30-0092	1.5	1.16	100	225
EC1 30-0093	1.5	1.16	150	225
EC1 30-0097	1.65	1.28	75	190
EC1 30-0095	1.65	1.28	100	190
EC1 30-0096	1.65	1.28	150	190



Premium Corning 7056 (Alkali Barium Borosilicate) Patch Glass

Now Available in Premium Line!

Corning 7056 glass is now offered in place of the 7052 glass, last melted in 1992 and no longer available. The 7056 formula has also been discontinued by Corning (last melt in 1995) but stocks of this material are still available. The properties of the 7056 glass are similar to the 7052 as is its performance in patch experiments.

Specifications

Composition	68% SiO ₂ , 18% B ₂ O ₃ , 9% K ₂ O, 3% Al ₂ O ₃ , 1% Li ₂ O, 1% Na ₂ O
Softening Temperature	718°C
Dielectric Constant	5.7

Premium Corning 7056 Patch Glass

Order #	Model	OD mm	ID mm	Length mm	Qty.
EC1 64-0812	G75150S-4	1.50	0.75	100	225
EC1 64-0813	G75150T-4	1.50	1.10	100	225
EC1 64-0814	G75165T-4	1.65	1.20	100	190



Premium Corning 8161 (Potash Rubium Lead) Patch Glass

This glass pulls at a lower temperature and is easily shaped. It is recommended for low noise recordings. However, the lead content should be considered for the intended application.

Specifications

Composition	51% PbO, 39% SiO ₂ , 6% K ₂ O, 2% BaO
Softening Temperature	600°C
Dielectric Constant	8.3

Premium Corning 8161 (Potash Rubium Lead) Patch Glass

Order #	Model	OD mm	ID mm	Length mm	Qty.
EC1 64-0815	G86150T-4	1.50	1.10	100	225
EC1 64-0816	G86165T-4	1.65	1.20	100	190

Clark Capillary Glass



Previous



Next



Borosilicate Capillaries

The properties of borosilicate glass make it the most popular material among researchers for the fabrication of electrodes and micro-pipettes. Its low softening temperature combined with its mechanical strength, chemical durability, high electrical resistivity, and its ability to withstand thermal stress, make these capillaries the most widely used in the world. Clark borosilicate capillaries are offered in a variety of diameters and wall thickness (standard or thin walled) with or without an inner filament. They are available in fused multi-barrel configurations, as well as in theta style. Single barrel glass is available in 75 mm (3 in), 100 mm (4 in) and 150 mm (6 in) lengths.

- High quality borosilicate glass
- Five outside diameters available
- Available with either thin or standard wall
- Ratio of outside to inside diameters preserved to tip
- Economical

Borosilicate Thin Wall without Filament



Borosilicate Thin Wall without Filament

Order #	OD mm	ID mm	Length mm	Qty.
EC1 30-0037	1.0	0.78	75	500
EC1 30-0035	1.0	0.78	100	500
EC1 30-0036	1.0	0.78	150	500
EC1 30-0049	1.2	0.94	75	350
EC1 30-0047	1.2	0.94	100	350
EC1 30-0048	1.2	0.94	150	350
EC1 30-0064	1.5	1.17	50	225
EC1 30-0065	1.5	1.17	75	225
EC1 30-0062	1.5	1.17	100	225
EC1 30-0063	1.5	1.17	150	225

Discounts on Quantity Purchases:

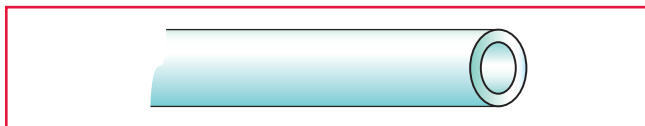
Discount apply to only single part number quantities (no mixing).

1 to 4	none
5 to 9	5%
10+	10%

Specifications

Composition	80.9% SiO ₂ 12.9% B ₂ O ₃ 4.4% Na ₂ O 1.8% Al ₂ O ₃
Softening Temp.	815°C
Dielectric Constant	4.7

Borosilicate Standard Wall without Filament



Borosilicate Standard Wall without Filament

Order #	OD mm	ID mm	Length mm	Wall	Qty.
EC1 30-0018	1.0	0.58	75	.21	500
EC1 30-0016	1.0	0.58	100		500
EC1 30-0017	1.0	0.58	150		500
EC1 30-0043	1.2	0.69	75		350
EC1 30-0042	1.2	0.69	100	.25	350
EC1 30-0041	1.2	0.69	150		350
EC1 30-0056	1.5	0.86	75		225
EC1 30-0054	1.5	0.86	110		225
EC1 30-0053	1.5	0.86	100	.32	225
EC1 30-0055	1.5	0.86	150		225
EC1 30-0073	2.0	1.16	75		125
EC1 30-0070	2.0	1.16	100		125
EC1 30-0071	2.0	1.16	150	.42	125
EC1 30-0127	3.0	1.62	75		55
EC1 30-0080	3.0	1.62	100	.69	55
EC1 30-0081	3.0	1.62	150		55

Clark Capillary Glass (continued)



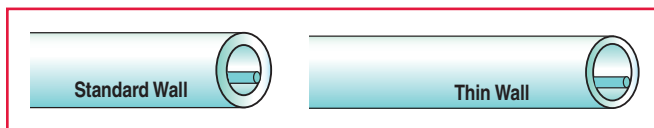
Previous



Next



Borosilicate with Filament

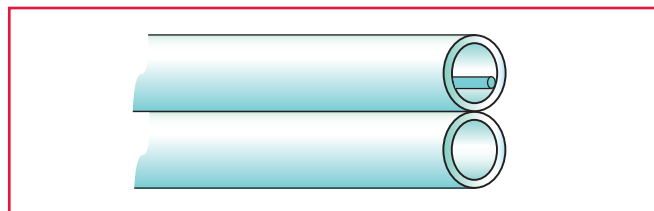


- Easy filling
- Available in standard or thin wall configurations with selection of three outside diameters
- Exceptionally low tip impedance (less than 50 MΩ)
- Good for patch clamp pipettes and microinjection needles

Borosilicate with Filament

Order #	OD mm	ID mm	Length mm	Qty.
Borosilicate Standard Wall with Filament				
EC1 30-0034	1.0	0.50	75	500
EC1 30-0032	1.0	0.50	100	500
EC1 30-0033	1.0	0.50	150	500
EC1 30-0021	1.0	0.58	75	500
EC1 30-0019	1.0	0.58	100	500
EC1 30-0020	1.0	0.58	150	500
EC1 30-0046	1.2	0.69	75	350
EC1 30-0044	1.2	0.69	100	350
EC1 30-0045	1.2	0.69	150	350
EC1 30-0060	1.5	0.86	75	225
EC1 30-0057	1.5	0.86	100	225
EC1 30-0058	1.5	0.86	150	225
EC1 30-0076	2.0	1.16	75	125
EC1 30-0074	2.0	1.16	100	125
EC1 30-0075	2.0	1.16	150	125
EC1 30-0084	3.0	1.62	75	55
EC1 30-0082	3.0	1.62	100	55
EC1 30-0083	3.0	1.62	150	55
Borosilicate Thin Wall with Filament				
EC1 30-0040	1.0	0.78	75	500
EC1 30-0038	1.0	0.78	100	500
EC1 30-0039	1.0	0.78	150	500
EC1 30-0052	1.2	0.94	75	350
EC1 30-0050	1.2	0.94	100	350
EC1 30-0051	1.2	0.94	150	350
EC1 30-0068	1.5	1.17	75	225
EC1 30-0066	1.5	1.17	100	225
EC1 30-0067	1.5	1.17	150	225
EC1 30-0128	2.0	1.56	75	125
EC1 30-0077	2.0	1.56	100	125
EC1 30-0078	2.0	1.56	150	125

Borosilicate Double and Triple Barrel Specials



- High quality borosilicate glass
- Special two barrels - one barrel with filament, one without
- Ratio of outside to inside diameter preserved to tip during pull

Borosilicate Double Barrel Special

Order #	OD mm	ID mm	Length mm	Qty.
EC1 30-0004	1.5	0.86	75	100
EC1 30-0005	1.5	0.86	100	100
EC1 30-0006	1.5	0.86	150	100
EC1 30-0009	1.5	0.86	100	100
EC1 30-0010	1.5	0.86	150	100
EC1 30-0011	1.5	0.86	75	100

Borosilicate Theta Glass



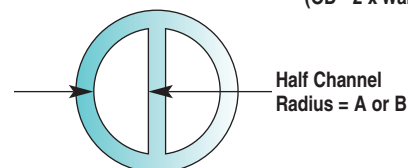
- Easy to fill
- Two channels in a single diameter

Borosilicate Theta Glass

	Order #	OD mm	ID mm	Septum mm	Length mm	Qty.
A	EC1 30-0116	1.5	0.23	0.17	75	100
	EC1 30-0114	1.5	0.23	0.17	100	100
	EC1 30-0115	1.5	0.23	0.17	150	100
B	EC1 30-0119	2.0	0.30	0.22	75	100
	EC1 30-0117	2.0	0.30	0.22	100	100
	EC1 30-0118	2.0	0.30	0.22	150	100

A: 0.435 mm
B: 0.59 mm

HRC = 1/2
(OD - 2 x Wall Sept)



Clark Capillary Glass (continued)



Previous



Next

Section Table of Contents

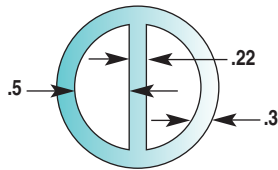
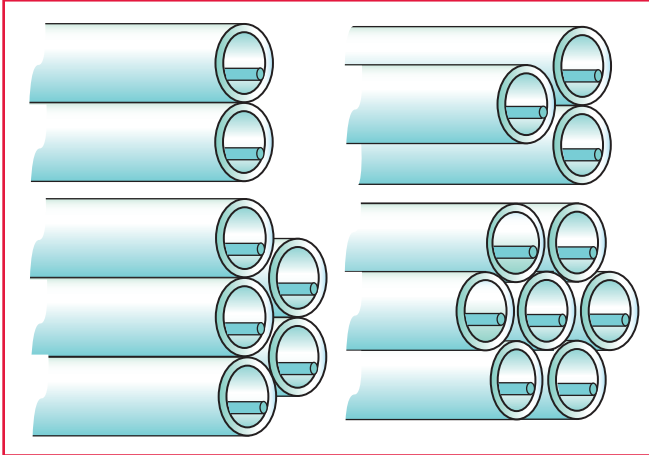
Main Table of Contents

Search

WWW Home

Contact Us

Borosilicate Multi-Barrel

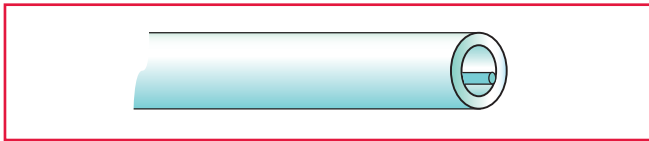


- High quality borosilicate glass
- Two, three, five and seven barrel configurations with filament
- Capillaries fused along their full length

Borosilicate Multi-Barrel

Order #	OD mm	Wall mm	# of Septum	Barrels	Qty.
EC1 30-0003	1.5	0.86	75 mm	2	100
EC1 30-0001	1.5	0.86	100 mm	2	100
EC1 30-0002	1.5	0.86	150 mm	2	100
EC1 30-0007	1.2	0.69	100 mm	3	100
EC1 30-0008	1.2	0.69	150 mm	3	100
EC1 30-0012	1.2	0.69	100 mm	5	65
EC1 30-0013	1.2	0.69	150 mm	5	65
EC1 30-0014	1.0	0.58	100 mm	7	60
EC1 30-0015	1.0	0.58	150 mm	7	60

Aluminosilicate Capillaries with Filament



Aluminosilicate Capillaries with Filament

Order #	OD mm	ID mm	Length mm	Qty.
EC1 30-0110	1.0	0.53	75	500
EC1 30-0108	1.0	0.53	100	500
EC1 30-0109	1.0	0.53	150	500
EC1 30-0129	1.2	0.69	100	350

Specifications

Composition	51.9% SiO ₂ , 22.0% Al ₂ O ₃ , 7.8% P ₂ O ₅ , 7.7% MgO, 6.9% CaO, 2.1% B ₂ O ₃ , 1.4% BaO and 0.2% As ₂ O ₃
Softening Temperature	950°C
Dielectric Constant	6.2

Aluminosilicate Capillaries

In recent years there has been a developing interest in fabricating micropipettes from aluminosilicate glass. Like silicon, aluminum combines with oxygen to form Tetrahedral Networks and the Al-O bonds are very strong. In comparison with borosilicate glass, **aluminosilicate** provides increased hardness, improved chemical durability, reduced electrical conductivity and a lower coefficient of thermal expansion. Also, while the original ratio of a borosilicate capillary's inner to outer diameter will remain unchanged over its total taper length, aluminosilicate glass demonstrates a marked tendency to thin out as it is drawn to a tip. This behavior allows extremely fine tips to be formed.

For more information, see:

1. Na/H Exchange, Vaugban-Jones, R.D.; Grinstein Press, Cb.1 p.8;
2. Effects of intracellular and extracellular pH on contraction in isolated mammalian cardiac muscle, Bountra, C. & Vaugban-Jones, R.D.; Journal of Physiology Volume 418 (1989)

Borosilicate Glass Rod



Borosilicate Glass Rod

Order #	OD mm	Length mm	Qty.
EC1 30-0087	1.0	75	500
EC1 30-0085	1.0	100	500
EC1 30-0086	1.0	150	500

- High quality borosilicate glass
- Available in two diameters

Pipette Sterilization and Micropipette



Previous



Next

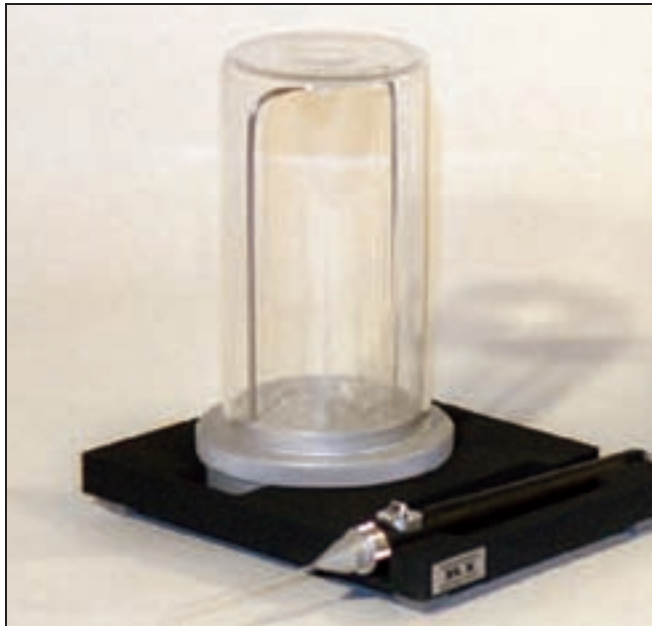
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us

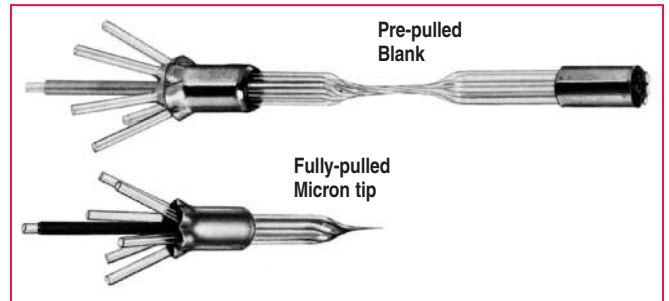


- Ideal for dry heat sterilization of pipettes
- Pyrex-type glass covers make contents easily visible
- Holds 21 pipettes
- Available for 1.0, 1.2, 1.5 and 2.0 mm diameter pipettes

Pipette Sterilization and Storage Container

This container is a convenient and easy to use pipette storage container. It is ideal for both storage and dry heat sterilization of micropipettes. In most application pipettes must be free from contamination at all times. By storing completed pipettes and partially made pipettes (between operations), the cleanliness of the micropipettes can be assured. Because the covers are made of Pyrex glass, the complete container with pipettes in-situ can be dry-heat sterilized, ensuring contamination-free pipettes. The base accepts 21 pipettes. Select from containers holding either 1.0, 1.2, 1.5 or 2.0 mm OD pipettes.

Order #	Product
EC1 69-0114	Pipette Sterilization and Storage Container for 1.0 mm Pipettes
EC1 69-0316	Pipette Sterilization and Storage Container for 1.2 mm Pipettes
EC1 69-0317	Pipette Sterilization and Storage Container for 1.5 mm Pipettes
EC1 69-0318	Pipette Sterilization and Storage Container for 2.0 mm Pipettes



- Easy filling
- Minimal tip resistance
- Minimal leakage
- Available pre-pulled or fully-pulled

7-Barrel Iontophoresis Micropipette

The MS-7P Micropipette has been designed for iontophoretic use as well as for pneumatic ejection of drugs. The standard blank consists of seven barrel, pyrex Omegadot tubing, 1.5 mm outer diameter and 1.2 mm inner diameter, pre-pulled to 2.0 mm formation as shown. The design of the micropipette readily lends itself to electrical connection by inserting Ag wire or to pressure tube attachment for pneumatic use. The overall length of the blank assembly is 10 centimeters. The micropipette is supplied as either pre-pulled blanks or fully-pulled to a micron tip as shown. The micron tip is not bumped and therefore can be finalized prior to use.

Features

- The orifice ratio of each barrel is 0.80 and thus is optimized for minimal tip resistance when pulled to micron size.
- Omegadot tubing permits easy filling.
- Fanned-out outer barrel assembly provides separation thus avoiding leakage due to spills and any cross-coupling between barrels.
- The 22 mm long twisted segment of the blank assembly assures singular tip formation during pulling action thus provides flexibility in a selection of a desired tip configuration.

Order #	Model	Micropipettes
EC1 65-0207	MS-7PB	Micropipette 7-Barrel, 1.5 mm OD Borosilicate Glass, Pre-Pulled Blank, pkg. of 20
EC1 65-0208	MS-7MT	Micropipette 7-Barrel, 1.5 mm OD Borosilicate Glass, Fully-Pulled, approx. 20 μm Tip, pkg. of 10

stimulation & recording

HSE-HA Marsh Ganglion Bath



Previous



Next



Section Table of Contents



Main Table of Contents



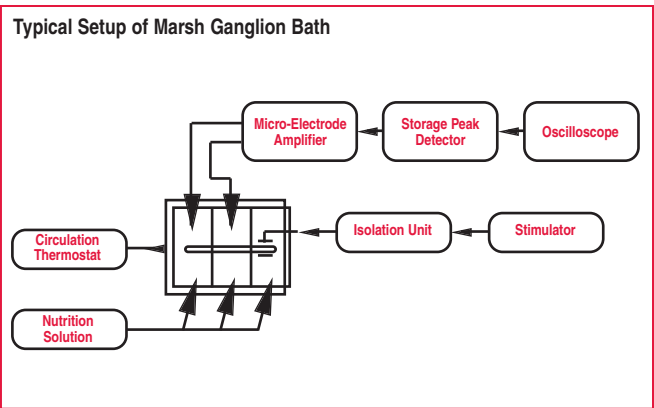
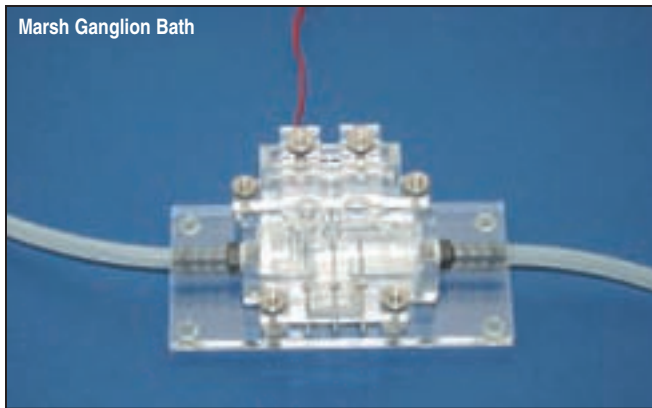
Search



WWW Home



Contact Us



- Peak height amplifier
- For studying:
 - Synaptic transmission
 - Nerve conduction
- Applications include:
 - Vagus nerve
 - Cervical ganglion

The HSE-HA Marsh Ganglion Bath is intended to test the action of drugs on the synaptic transmission or nerve conduction in the vagus nerve or the cervical ganglion.

The bath is an open-top Perspex bath which is divided into three chambers by two sliding separators. Each of these separators consists of a lower and an upper part with a cutout to allow the nerve to pass through. The chambers are sealed against each other with Silicone paste. The first chamber contains two platinum electrodes for stimulation. In the second chamber the solution is fed near the bottom of the chamber and drawn off at the surface. The stainless steel inflow and outflow tubes are grounded in order to reduce electrical interference.

The Marsh Ganglion Bath set (EC1 73-0387) includes the necessary components to produce two plastic recording electrodes filled with a conductive agar. A terminus Ag/AgCl plug with integrated 2 mm pin socket is used to interconnect the recording chamber and electrode with the PHDA headstage amplifier (EC1 73-1743). The prepared electrodes can be used for up to two weeks (with proper storage) to record extracellular potentials from the nerve preparation.

In addition to a stimulator, electronic equipment includes an amplifier with high-impedance input and a peak height detector (PLUGSYS module PHDA) in order to record the spike peaks. An oscilloscope, recorder or data acquisition system are useful accessories for determining the changes in membrane potential and the amplitudes of the evoked potentials in relation to the applied drug. The peak height detector allows the rapid spikes to be recorded on a relatively slow recorder.

References:

- 1) Brown, D.A., Marsh, S.: Axonal GABA-receptors in mammalian peripheral nerve trunks. *Brain Res.* 156, 187-191 (1978)
- 2) Brown, D.A., Adams, P.R., Higgins, A.J. and Marsh, S.: Distribution of gaba-receptors and gaba-carriers in the mammalian nervous system. *J.Physiol., Paris*, 1979, 75, 667-671
- 3) Brown, D.A., Forward, A., Marsh, S.J.: Antagonists discrimination between ganglionic and ileal muscarinic receptors. *Br.J.Pharmac.* 71, 362-364 (1980)
- 4) Brown, D.A., Forward, A., Marsh, S.J.: Possible electrophysiological mechanisms for modulating transmitter release. In: *Presynaptic Receptors, Mechanisms and Functions* (edited by J. de Belleruche), 207-218. Ellis Horwood Publishers (1982)
- 5) Marsh S.J.: Depolarization of rat vagal C-fibres and neurons by capsaicin in-vitro. *J.Physiol.(Lond.)* 360, 14 P (1985)
- 6) Marsh, S.J., Stansfeld, C.E., Brown, D.A., Davey, R., McCarthy, D.: The mechanism of action of capsaicin on sensor C-type neurons and their axons in-vitro. *Neuroscience* 23, 275-289 (1987)
- 7) Marsh, S.: An extracellular recording technique for monitoring drug induced changes in membrane polarization and evoked potential amplitudes from whole nerve bundles and ganglia. In: *FFB4, Electrodes for Stimulation and Bioelectric Potential Recording* (1988), 232-235. Publ. by Biomesstechnik-Verlag March, D-79232 March, Germany.
- 8) Marsh, S.: *Extracellular Recording from Rat Sympathetic Ganglia and Whole Nerve Bundles.* Biomesstechnik Series, Vol. VI. Publ. by Biomesstechnik-Verlag March, D-79232 March, Germany. (1989).
- 9) Newberry, N.R.: Priestley, T., Woodruff, G.N.: Pharmacological distinction between two muscarinic responses on the isolated superior cervical ganglion of the rat. *Eur.J.Pharmacol.* 116, 191-192 (1985)
- 10) Southam, E., Charles, S.L., Garthwaite, J.: The nitric oxide-cyclic GMP pathway and synaptic plasticity in the rat superior cervical ganglion. *Br.J.Pharmacol.* 119, 527-532 (1996)

Specifications

Weight of Marsh Ganglion Bath:	0.2 kg (0.45 lb)
Dimensions of Marsh Ganglion Bath:	
Basic Plate	130 x 60 x 8 mm (5.1 x 2.4 x 0.3 in)
Outer Dimensions	73 x 30 x 18 mm (2.9 x 1.2 x 0.7 in)
Inner Dimensions	50 x 10 x 10 mm (2 x 0.4 x 0.4 in)
Volume	5 ml max.

stimulation & recording

HSE-HA Marsh Ganglion Bath



Previous



Next

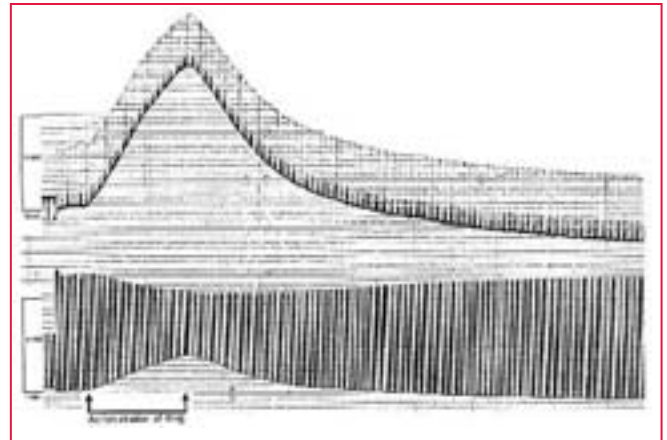
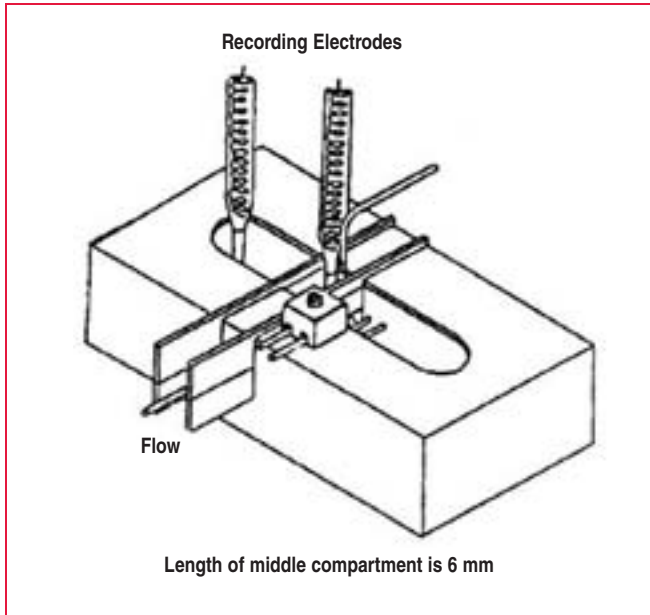
Section Table of Contents

Main Table of Contents

Search

WWW Home

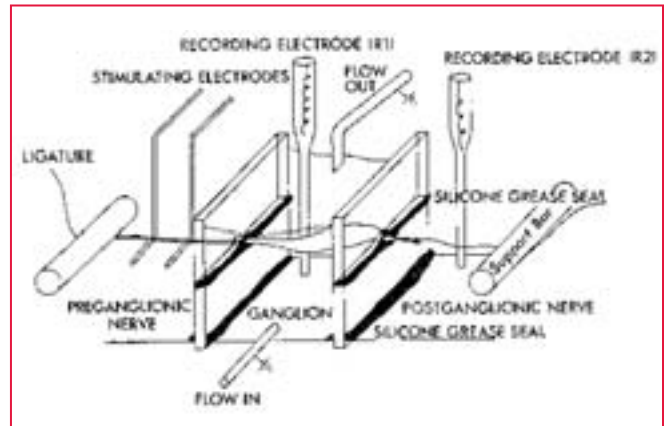
Contact Us



Use of peak height detector for monitoring capsaicin-induced ($0.3 \mu\text{mol}$) depolarization of adult vagus nerve. Amplified high-gain DC trace showing time course and amplitude of capsaicin-induced response. Amplified recording of both membrane polarization and reduction in C-spike amplitude induced by capsaicin.



Peak Height Detector Amplifier plugs into Basic System Case Type 609



Order #	Product
EC1 73-2414	Marsh Ganglion Bath Type 858
EC1 73-0387	Set of Electrode Components to Marsh Ganglion Bath
EC1 73-1523	PLUGSYS Minicase Type 609
EC1 73-1743	PHDA PLUGSYS Peak Height Detector Amplifier Module Type 683
EC1 73-2802	3 Liter Thermostat/Thermocirculator, E103, 115 V, 60 Hz
EC1 73-0125	3 Liter Thermostat/Thermocirculator, E103, 230 V, 50 Hz
EC1 73-3716	Stimulator C Type 224, 115 V, 60 Hz
EC1 73-3713	Stimulator C Type 224, 230 V, 50 Hz
EC1 73-2696	Universal Isolated Stimulation Unit, 115 V, 60 Hz
EC1 73-0504	Universal Isolated Stimulation Unit, 230 V, 50 Hz

*For Surgical Instruments, see Section E.
For Isolated Tissue and Organ Systems, see Section K.*

Micro-Iontophoresis and Micro Injection

Harvard/Medical Systems Neuro Phore BH-2 System

In the past few decades, the application of drugs and other dissolved agents from multibarrel electrodes/pipettes has evolved into a practical method of testing their effects on cells or cellular systems. The versatile Neuro Phore BH-2 System is designed to facilitate controlled ejection of fluids from multibarrel micropipettes. Extracellular ejections of minute volumes can be delivered using up to five pumps in serial or parallel. The ejection schedule for each pump can be independently programmed for sequential or simultaneous output. Ejection cycles can be internally timed, triggered manually, or synchronized to external events.

This flexible system allows the use of iontophoretic pump modules, pneumatic pump modules, or a combination of both. By interchanging the IP-2 Iontophoresis Pump Module with a PPM-2 pneumatic pressure pump, the overall system capability can be expanded for simultaneous pressure and iontophoretic injection of drugs from a multibarrel pipette.

The Neuro Phore BH-2 System was developed under the guidance of active researchers with extensive experience in iontophoresis techniques. These researchers needed a system to provide precise stimulation and quantitative control for ejection of drugs in their pharmacological studies of drug evoked responses such as neurosynaptic discharges, contraction, and changes in chemical concentration. What emerged was a reliable, accurate, easy to use, Neuro Phore BH-2 system that is capable of accommodating high impedance multi-barreled micro-electrode pipettes.

- Automatic current neutralization for minimal electrical artifacts
- Digitally controlled eject and pause timing utilizes easy to read and set digital panel switches on each iontophoretic or pressure module/channel
- Unbalance and out of compliance indicators are a great aid in troubleshooting clogged pipettes and other problems
- External analog input control allows external programming of complex, or closed loop injection protocols
- Current and electrode resistance readout with large bright easy to read digital displays

System Configuration

The Neuro Phore BH-2 System is modular and is comprised of the following components (all ordered separately):

- One BH-2 Mainframe Chassis, EC1 65-0600 that can accommodate 1 to 5 Iontophoretic Pump and/or Pressure Pump Modules; Mainframe Chassis can be rack mounted or set on table
- One BM-2 Control and Balance Module, EC1 65-0602
- IP-2 Iontophoretic Pump Modules, EC1 65-0603 and/or
- PPM-2 Pressure Pump Modules, EC1 65-0604
- One low noise MS-2 Power Supply, EC1 65-0601
- Blank Panel DP-1 Dummy Module, EC1 65-0605 used to maintain timing if less than 5 Pump Modules are installed
- One Model OC-01 output cable, EC1 65-0215
- One Model NL-952 lemo cable, EC1 65-0285

For Surgical Equipment, see Section D.



The Neuro Phore BH2 System Unit pictured contains three IP-2 Pump Modules and two PPM-2 Pump Modules and one BM-2 Control and Balance Module

- Used by leading researchers for over 20 years
- Modular
- Minimal noise
- Up to 6 channels
- Digitally controlled eject and pause timing
- Mix and match pump types

Features

- Successfully utilized in key laboratories around the world for over 20 years, with many journal articles published as a result
- Modular design; buy what you need now and add additional modules later as your protocol evolves
- Accommodates 7 barrel micropipettes, supports the most complex and demanding injection and recording protocols
- Extremely low noise, ± 105 volts compliance, allows rapid iontophoretic injection with even the smallest micropipette tips

Harvard/Medical Systems Neuro Phore BH-2 System

Micro-Iontophoresis and Micro Injection (continued)



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

BH-2 Mainframe Chassis

The BH-2 Mainframe Chassis is pre-wired to accept one Control and Balance module and five Iontophoretic Pump Modules and/or Pneumatic Pump Modules. The selected modules are specified by the researcher and depend on applications. Although all components are ordered separately, the unit is assembled, calibrated, and balanced by Harvard Apparatus before shipping.

BM-2 Balance Module: Balance and More

In addition to providing current neutralization (automatic feedback and control of inverse sum of all pump currents), the balance module has independent capability of current pump settings with a working range of 0 to 500 nanoamperes. The Balance Module includes a digital display, time clock, provisions for electrical and manual cycle start/stop and single cycle/recycle switch, trigger, and gate input terminals to initiate externally controlled eject pumping action of respective modules. Analog input for balance or drive with override capability. Analog output for monitoring of unbalance currents.

**Brain Slice Chambers are available in a variety of formats. Please visit our website for more information.*

Specifications

Neutralization (balance)	
Pump Range	Max. ± 2500 nA automatically controlled
Current Pump	Compliance ± 105 V linear constant current source; manually adjustable 0 to 500 nA by pump control; polarity selected +/- switch
Digital Meter Display	3 digits and sign
Unbalance Current/Current	Pump Switch:
Unbalance	Digital display reads unbalance (ground going) current in nA
Current Mode	In this mode, automatic current neutralization is provided
Current Pump Mode	Automatic balance feature is switched off; display reads amount of current in nanoamperes passed through balance barrel as adjusted by pump control
Single Cycle Mode	In single cycle mode, start switch or external trigger initiates each cycle
Recycle Mode	In recycle mode, once start switch or external trigger is actuated, repetitive cycles commence automatically
Time Unit Switch	Two basic time units can be selected, 10 msec or 1 sec. In 10 msec position, Eject and Pause time switches of IP-2 Modules can be set to cover time range from 10 to 990 msec with 10 msec resolution. In 1 sec position, time scale is expanded from 1 to 99 sec with 1 sec resolution.
Inputs	Cycle start, stop, trigger/gate #1 through #5; banana jacks terminals, floating input, optically coupled; input voltage ± 5 to ± 15 V TTL compatible
Analog Input	Lemo miniature receptacle, ground referenced 5 mV/nA; input impedance 100 k Ω
Analog Output	Lemo miniature receptacle, 5 mV/nA ground referenced
Sync Output	Lemo miniature receptacle, TTL pulse
Output Connector	7-pin miniature connector, mates with ultra flexible cable leading to micro-electrode holder
Dimensions, H x W x D	21 x 47 x 35 cm (8.75 x 19 x 14 in)
Weight	8.2 kg (18 lb)

Order # Product

EC1 65-0600	BH-2 Mainframe Chassis (Does Not Include BM-2 Balance Module, see Below)
EC1 65-0602	BM-2 Control and Balance Module with OC-01 and NL-952

Application Note: Working Unit:

One (1) each of BH-2 Main-Frame, MS-2 power supply, BM-2 Control & Balance module and any combination of one (1) to five (5) modules selected from IP-2 and/or PPM-2. If less than five (5), DP-1 module is required to fill the spaces.

MS-2 Power Supply

The AC power supply is self contained in a rack-mounted cabinet and provides all voltages required to operate the Neuro Phore System. The power supply interconnects with the mainframe via flexible cable. The supply works with 115 or 220 VAC, 50/60 Hz mains source.

Specifications

Outputs	± 125 V at 0.1 A ± 15 V at 0.5 A -5 V at 3 A Line operated 115 to 220 VAC, 50/60 Hz
Dimensions, H x W x D	13 x 47 x 35 cm (5-1/4 x 19 x 14 in)
Weight	11 kg (24 lb)

Order # Product

EC1 65-0601	MS-2 Power Supply with Power Cord
--------------------	-----------------------------------

Harvard/Medical Systems Neuro Phore BH-2 System

Micro-Iontophoresis and Micro Injection (continued)



Previous



Next



PPS-2 Mini-Frame

The rack mountable PPS-2 Mini-Frame was designed as a less expensive alternative to the BH-2 for those applications that require pressure injections only. The PPS-2 is a multichannel pneumatic pumping system, designed especially for short-term pressure ejection of small quantities of fluids through micropipettes. The system can operate with up to four PPM-2 Pump Modules. Each module can be programmed to its own schedule of ejection and pause times, coordinated with the other modules. Ejection and pause times cover a range of 10 to 990 milliseconds with 10 millisecond resolution and 1 to 99 seconds with 1 second resolution. Continuous and cyclical modes of operation are also available.

System Configuration

The PPS-2 system (Order # EC1 65-0606) includes a Control Module and a power supply. It is pre-wired to accept up to four PPM-2 Pneumatic Pressure Modules (Order # EC1 65-0604) which are ordered separately.

The Control Module CM-1 includes a time clock. Panel mounted push-buttons as well as TTL electrical inputs are provided to control the following functions: Cycle Start/Cycle Stop, Trigger (each PPM-2), and Gate (each PPM-2). In essence, the CM-1 Control Module provides all necessary signals to operate the sequential and single shot timing for the installed PPM-2 Pneumatic Pump Modules.

A Self Cycle mode control switch controls independent self timing action of each of the pneumatic pump modules. The self-timing action permits each PPM-2 Pump Module to eject and pause for a predetermined period.

Actuating any of the self cycle control switches causes the respective PPM-2 Module to be engaged into the self timing mode. The push buttons at the corresponding trigger/gate terminals initiate the self cycle timing action.

Specifications

Cycle Start, Cycle Stop, Trigger/Gate Inputs	Push-button, and banana jack terminals; floating input, optically coupled
Input Voltage	± 5 to ± 15 V
Minimum Trigger Pulse Width	5 μ sec at 5 V
Sync Out	Lemo miniature connector TTL pulse
Single Cycle Mode	In single cycle mode, start switch or external trigger initiates each cycle
Recycle Mode	In recycle mode, once start switch or and external trigger is actuated, repetitive cycles will continue until stopped
Time Unit Switch	Two basic time units can be selected: 10 msec or 1 sec. In 10 msec position, Eject and Pause time switches of PPM-2 Modules can be set to cover time range from 10 to 990 msec with 10 msec resolution. In 1 sec position, time scale is expanded to 1 to 99 sec with 1 sec resolution
Power	115 VAC, 50/60 Hz (100 or 220 VAC optional)
Dimensions, H x W x D	21 x 47 x 35 cm (8.75 x 19 x 14 in)
Weight	5.5 kg (12 lb) PPS-2 Mini-Frame System: mainframe, power supply and CM-1 Control Panel. PPM-2 Modules not included.

Application Note: Working Unit

Mini-Frame, Power Supply, and Control Panel plus four (4) modules selected from PPM-2 and DP-1

Order # Product

EC1 65-0606	PPS-2 Mini-Frame with Power Supply, Control Module and NL-952 Power Cord and Manual
EC1 65-0604	PPM-2 Pneumatic Pump Module with OH-01 and IH-01, PPS-2 System Can Support 1 to 4 Modules
EC1 65-0605	DP-1 Dummy Module (to Maintain Timing) PPS-2 System Can Support 1 to 4 Modules
EC1 65-0210	Model SC-01, Tygon Flexible Hose Micropipette Interface Coupling for Pneumatic (PPM-2) Use
EC1 65-0211	Model SC-02, Tygon Flexible Hose Micropipette Interface Coupling for Current (IP-2)/Pneumatic (PPM-2) Use
EC1 65-0212	Model IH-01, Input Hose 2.7 m (9 ft) Coupling to PPM-2
EC1 65-0213	Model OH-01, Output Hose 2.7 m (9 ft) Including SC-01 Coupling
EC1 65-0214	Model OH-02, Output Hose 2.7 m (9 ft) Including SC-02 Coupling
EC1 65-0215	Model OC-01, Output Cable 2.7 m (9 ft) with (7) Seven-Pin Lemo Connector
EC1 65-0285	Model NL-952, Cable 2 m (6.5 ft) with Lemo Miniature Connector at One End and Tinned Leads at Other (Sync. Output or Analog Input/Output Cable)

Micro-Iontophoresis and Micro Injection (continued)



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

IP-2 Iontophoresis Pump Module

Each IP-2 Module includes controls for precise settings of current magnitude and polarity (retention 0 to 50 nanoamperes, ejection 0 to 500 nanoamperes). The actual current and polarity is continuously displayed digitally and can be externally monitored at the analog output terminal.

Operating Modes

Ejection Timing and Mode Switch

The mode switch provides five push-button controls which include operations such as cycle, trigger, gate, continuous, and termination.

Cycle Mode

In the cycle mode by virtue of selecting single or recycle operation on the BM-2 Module an incoming trigger or cycle start push-button will initiate the current ejection pumping action. In this mode each succeeding Pump Module is automatically triggered after the pause time of the preceding event has been completed. Both eject and pause times can be preset to cover a range from 10 to 990 milliseconds with a 10 millisecond resolution and 1 to 99 seconds with a 1 second resolution.

Trigger Mode

When the TRIG. switch is energized the eject time interval will be started by virtue of the incoming trigger pulse applied to the respective inputs on the BM-2 Balance Module. Eject timing interval can be preset covering a range from 10 to 990 milliseconds with a 10 millisecond resolution and 1 to 99 seconds with a 1 second resolution.

Gate Mode

When the GATE switch is energized the eject current will be started by virtue of a gate input signal applied to the respective trigger/gate terminals on the BM-2 Balance Module. The eject and pause time settings are not operative in this mode, since the eject time function is slaved to the duration of the gate input.

Continuous Mode

When the CONT. switch is energized the ejection pump current is continuously maintained.

Termination Mode

When the TERM. switch is energized the output is automatically diverted from the preparation into an internal 'dummy load' (100 M Ω). This function is particularly useful for testing of possible instability in the preparation pipette.

Analog Input

The analog input terminal is available to facilitate externally controlled current pumping action. An external voltage applied to the input will generate a pumping current at a ratio of 5 millivolts/nanoamperes. This current will be summated with any preset pump current governed by both the retention and ejection controls. The combined magnitude and sign of the summated pumping current is displayed on the digital display of each corresponding Pump Module. This input can be connected to a computer D/A converter when external programming is desired.

Analog Output

The analog output terminal provides a buffered voltage which is proportional in magnitude and polarity to the actual current passed from the current pump into the pipette. The conversion ratio is 5 mV/nA. This output can be polygraphically recorded to monitor progress of the experiment.

Sync Output

The sync output provides a TTL pulse that coincides with the eject time. This output is provided to trigger external devices such as a computer, event counter, etc.

Specifications

Current Pump	Compliance ± 105 V, linear constant current source
Ejection Current	Pulsing controlled by Ejection Timing Mode Switch; amplitude adjustable by 10-turn ejection control and range switch from 0 to 50 or 0 to 500 nA; polarity is selected by polarity switch; accuracy of ± 1 nA
Ejection Indicator	Red LED lamp indicates Eject time period; green LED lamp indicates pause time period
Retention Current	Amplitude adjustable by front panel dial from 0 to 50 nA; polarity automatically set opposite to ejection current polarity; socket (x3)
Analog Input	Lemo miniature receptacle, ground referenced 5 mV/nA; input impedance 100 k Ω , socket (x3)
Analog Output	Lemo miniature receptacle, ground referenced 5 mV/nA, socket (x3)
Sync Output	Lemo miniature receptacle, TTL pulse time incident with eject pulse
Current and Resistance	Digital Meter Display 3 digits and sign Metering System
Resistance/Current Switch:	
Current Mode	Switch in center 'nA' position, digital display reads total current in nA passed through micro-electrode pipette (sum of retention and ejection current)
Resistance Mode	Switch in either (pos) or (neg) M Ω position, digital display reads actual electrode barrel resistance in M Ω derived by passing positive or negative constant current (50 nA) through electrode pipette
Compliance Exceeded	Digital display will flash whenever electrode barrel resistance
Indicator	exceeds working range of current pump (i.e., when electrode resistance times current exceeds compliance of ± 105 V)
Voltage Readout Switch	Depressing switch will cause digital display to read voltage across pipette

Order # Product

EC1 65-0603 IP-2 Iontophoresis Pump Module

Harvard Apparatus offers a wide selection of surgical instruments, see Section E for more information.

Harvard/Medical Systems Neuro Phore BH-2 System

Micro-Iontophoresis and Micro Injection (continued)



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

PPM-2 Pneumatic Pump Module

Designed specifically for pressure injection of drugs in pharmacological studies of drug evoked responses (i.e. synaptic discharges, contraction, etc.) Emphasis has been given to pressure control and regulation (0 to 30 p.s.i.; optional 0 to 10 or 0 to 90 p.s.i.) as well as precise timing. The PPM-2 Module is comprised of a precise pressure regulator, digital display, transducer, and a timing mode switch. It connects to an external pressure source (such as a compressed bottle of N₂) which can be set to provide continuous or periodic pressure pulses ranging from 0 to 30 p.s.i. Outputs include (0 to 1 volt) proportional to output pressure as well as a sync pulse coincident with pressure cycle.

Operating Modes

Ejection Timing and Mode Switch

The mode switch provides five push-button controls which include operations such as cycle, trigger, gate, continuous, and termination.

Cycle Mode

In the cycle mode, after selecting single or recycle operation, the start push-button will initiate the ejection pumping action. In this mode each succeeding pump module is automatically triggered after the pause time of the preceding event has been completed. Both eject and pause times can be preset to cover a range from 30 to 990 milliseconds with a 10 millisecond resolution and 1 to 99 seconds with a 1 second resolution.

Trigger Mode

When the TRIG. switch is energized the eject time interval will be started by virtue of an externally applied trigger pulse fed to the respective inputs on the CM-I control panel. Eject timing intervals can be preset to cover a range from 30 to 990 milliseconds with a 10 millisecond resolution and 1 to 99 seconds with a 1 second resolution.

Gate Mode

When the GATE switch is energized pumping action will be started by virtue of a gate input signal applied to the respective trigger/gate terminals on the CM-I control panel. The eject and pause time settings are

not operative in this mode, since the eject time function is slaved to the duration of the gate input.

Continuous Mode

Eject pump action is continuously maintained when CONT. switch is energized.

Termination Mode

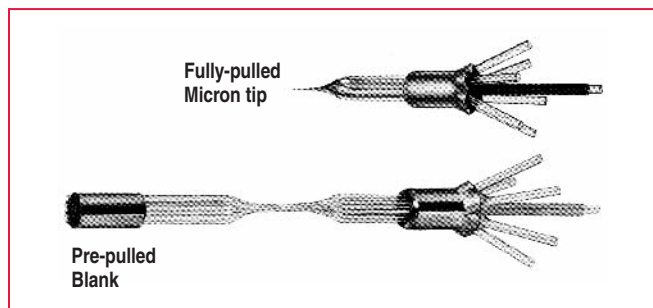
When the TERM. switch is energized, the output pressure is automatically diverted from the preparation. This function is particularly useful for setting up the desired pressure range and timing while preventing ejection of any drug from the pipette.

Specifications

Source Gas	Air or Nitrogen recommended (no explosive or combustible gases)
Input Pressure	125 p.s.i.g. (7.8 kg/cm ²) maximum
Input Filter	5 μm element
Output Pressure	0 to 99.9 p.s.i.g. (0 to 7 kg/cm ²), 30 p.s.i. standard
Output Pressure Display	Three decimal digits
Pressure Pulse Width:	
Minimum	30 msec
Maximum	99 sec (990 sec optional)
Gas Input and Output Couplings	Quick disconnect type
Analog Output	Lemo miniature connector, voltage proportional to output pressure, 0 to -999 mV full scale in p.s.i.g. setting; 0 to -700 mV full scale in kg/cm ² setting
Sync Output	Lemo miniature connector TTL pulse, time incident with output pressure pulse
Eject Time Indicator	Red LED
Pause Time Indicator	Green LED

Order # Product

EC1 65-0604	PPM-2 Pneumatic Pump Module with Input/Output Hose
--------------------	--



7-Barrel Iontophoresis Micropipette

The MS-7P Micropipette has been designed for iontophoretic use as well as pneumatic ejection of drugs. The standard blank consists of seven barrels, Pyrex Omegadot tubing, 1.5 mm outer diameter and 1.2 mm inner diameter, pre-pulled to 2 mm formation as shown. For complete details, see our Warner Instruments Cell Biology Catalog.

- Easy filling
- Minimal tip resistance
- Minimal leakage
- Available pre-pulled or fully-pulled

Order #	Model	Micropipettes
EC1 65-0207	MS-7PB	Micropipette 7-Barrel, 1.5 mm OD Borosilicate Glass, Pre-Pulled Plank, 20 per box
EC1 65-0208	MS-7MT	Micropipette 7-Barrel, 1.5 mm OD Borosilicate Glass, Fully-Pulled Approx. 20 μm Tip, 10 per box



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us



EC1 65-0336

- Easily reverses injection current polarity
- Provides a precise, repeatable current
- Battery operated
- Low power micro-controller technology

D380 Iontophoretic Dye Marker

For dye marking individual neurons in neuroanatomy research. This

unit provides an isolated bipolar constant current output intended for the marking of individual neurons with dyes such as Lucifer Yellow via iontophoresis. Holding currents up to +6nA and injection currents up to +12nA are provided and set by single turn panel mounted dials. A compliance voltage in excess of +6nA allows the full injection current into electrodes with impedances up to 500 MΩ. An LCD continuously shows the polarity and magnitude of the requested injection and holding currents as well as the electrode resistance and the voltage applied. The unit is powered from a single, standard, 9 volt battery.

4 Important Injection Parameters

- INJECT:** Requested injection current
HOLD: Requested hold current
RESISTANCE: Measured electrode resistance
POTENTIAL: Measured potential applied to electrode

Using the Deblock function allows the user to tell whether an electrode is

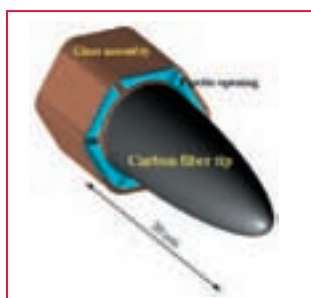
becoming blocked using these injection parameters. If a rise in resistance is detected, press the DEBLOCK button before the electrode is beyond its useful life.

Specifications

Output Current:	
Holding Range	0 to 6.3 nA in 0.1 nA (100 pA) steps
Injection Range	0 to 12.7 nA in 0.1 nA (100 pA) steps
Compliance Voltage Range	> +6 V
LCD Display:	
Inject	Injection current requested, with 100 pA resolution
Hold	Holding current requested, with 100 pA resolution
Resistance	Electrode resistance, with 10 MΩ resolution
Potential	Voltage applied to the electrode, with 100 mV resolution
Out of Compliance	'Potential' display will invert and flash
Low Battery Voltage	Indicated by flashing LCD display
Gate In	TTL 'high' (> +3 V) places unit in inject mode for duration
Connection	Standard BNC socket- labeled 'Output'
Power Requirements recommended	1 x PP3, IEC- 6R61 (9 V) battery, Alkaline
Typical Battery Life	In excess of 100 hrs (continuous operation)
Dimensions, H x W x D	175 x 120 x 40 mm (6.9 x 4.7 x 1.5 in)
Weight	400 g (14.1 oz) including battery

Order # Product

EC1 65-0336 Iontophoretic Dye Marker, Model D380



- Low noise recording
- 6 barrels for micro-iontophoresis injections

Combination Iontophoresis/Recording Electrode

Above is an illustration of the tip of

a seven barrel combination recording/iontophoresis electrode. The carbon fiber electrode is closely surrounded by 6 fused-together micropipettes allowing combined microiontophoresis and extracellular recording.

Microiontophoresis injection is most often used in conjunction with extracellular recording of neuronal firing. Since extracellular 'spikes' generated by action potentials across the membranes of neurons are typically only a few hundred microvolts in amplitude. They require a low noise recording electrode. Traditional electrolyte-filled glass micropipettes in a multibarrel assembly are electrically very noisy. Solid conductor micro-electrodes such as carbon fiber electrodes show significantly less noise in

extracellular recordings. Carbon fibers 5-8 micrometers in diameter are perfect for recording with an excellent signal-to-noise ratio recordings. The Microiontophoresis electrode-pipette assemblies are manufactured from our high quality Harvard-Clark borosilicate capillary tubing. Two standard types of tapers are available: 15 to 25 mm or 25 to 30 mm with a tip length of ~25 mm.

Specifications

Tip Diameter	~7 μm
Tip Length	~25 μm
Tip Taper	Either 15 to 25 mm or 25 to 30 mm
Connector	0.8 mm
Impedance at 1 kHz:	
Carbon Fiber	300 to 500 KΩ
Iontophoresis Barrels	8 to 10 MΩ

Order # Description

- EC1 69-0520 Combination 7 Barrel Recording/Iontophoresis Electrode Standard Taper (Carbostar-7), pkg. of 3
 EC1 69-0521 Combination 7 Barrel Recording/Iontophoresis Electrode Long Taper (Carbostar-7LT), pkg. of 3



Previous



Next

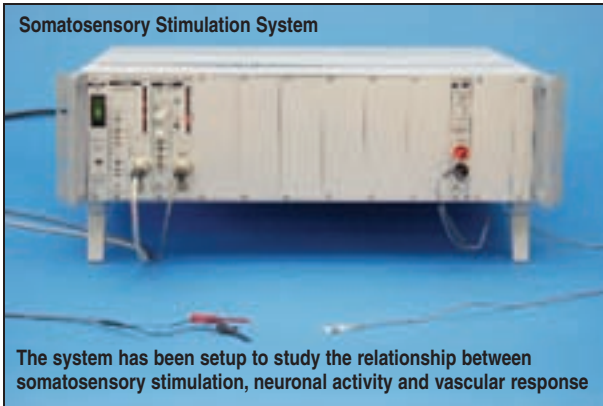
Section Table of Contents

Main Table of Contents

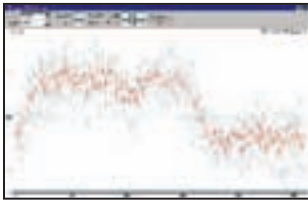
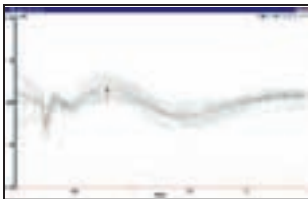
Search

WWW Home

Contact Us



The system has been setup to study the relationship between somatosensory stimulation, neuronal activity and vascular response



- Complete system for evaluating cerebral activity and vascular response to somatosensory stimulation
- Can be used as basic system for general EEG analysis
- Can be combined with the system for cerebral autoregulation studies

Somatosensory Stimulation

SEP and Cerebral Blood Flow System Description

The complete system includes a specific hardware and a dedicated software package.

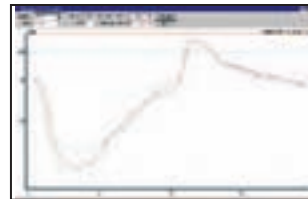
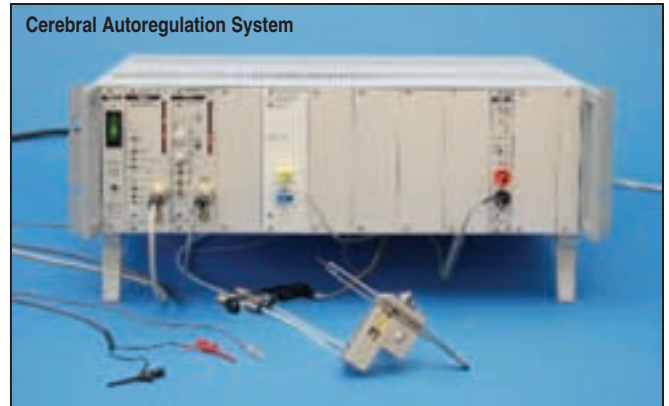
The hardware consists of:

- **Ventilator**
- **PLUGSYS maincase equipped with:**
 - Software controlled stimulator module PSM and a stimulation electrode
 - Blood pressure transducer (APT300) and the relevant amplifier (TAM-A)
 - EEG amplifier
 - Interface module (EIM) to connect the laser doppler flowmeter
- **Laser doppler flowmeter with adapted flow probe**

The hardware can optionally be extended for other measurements like ECG, temperature and venous pressure.

The software consists of:

- **The NEURODYN Data Acquisition Software**
- **The software module for somatosensory evoked potential (SEP) analysis and cerebral blood flow (CBF) averaging**



- Complete system for evaluating cerebral autoregulation
- Can be used as basic system for general EEG analysis
- Can be combined with the system for cerebral activity and vascular response to somatosensory stimulation

Cerebral Autoregulation

The system has been setup to study the cerebral autoregulation. A dedicated clamping system is used to occlude the carotid artery for a programmable period. The clamp is software controlled. The evaluation of the regional blood flow is synchronized to the clamping system. To allow reversible and repeated clamping without vascular damage a vessel clip of defined closing pressure of 0.25N is used.

System description

The complete system includes a specific hardware and a dedicated software package.

The hardware consists of:

- **Ventilator**
- **PLUGSYS maincase equipped with:**
 - Vessel clamping system
 - Blood pressure transducer (APT300) and relevant amplifier (TAM-A)
 - EEG amplifier (EEGA)
 - Interface module (EIM) to connect the laser doppler flowmeter
- **Laser doppler flowmeter with adapted flow probe**

The hardware can optionally be extended for other measurements such as ECG, temperature and venous pressure.

The software consists of:

- **The NEURODYN Data Acquisition Software**
- **The software module for cerebral autoregulation evaluation using clamping control and blood flow (CBF) averaging**



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

Order # Product

Ventilator

EC1 73-3597 KTR-5 Ventilator, 230 VAC, 50 Hz

Alternative to EC1 73-3597

EC1 73-3645 KTR-5 Ventilator, 115 VAC, 60 Hz

EC1 73-2833 Tracheal Cannula for Small Rat, OD 2.0 mm, L 25 mm, Includes Medium Y-Adapter OD 7.5 mm

Stereotaxic Frame

EC1 72-4792 Lab Standard Stereotaxic Equipment for Rats (Dual Manipulator) Model 51603, with 18 Degree Ear Bars

Alternative to EC1 72-4792 if Laser-Doppler Flow Is Not Used

EC1 72-4790 Lab Standard Stereotaxic Equipment for Rats (Single Manipulator), Model 51600, with 18 Degree Ear Bars

Basic System Case for The Multiple Amplifier Modules

EC1 73-0045 PLUGSYS Basic System Case Type 603

EC1 73-0065 TAM-A PLUGSYS Transducer Amplifier Module Type 705/1

EC1 73-0089 ISOTEC Pressure Transducer, Range -50 to 300 mmHg

EC1 73-0098 Stand for ISOTEC

EC1 73-0096 Three-Way Stopcock Type 9560 R

EC1 73-0097 One-Way Stopcock Type 9500

To Connect Laser Doppler Flowmeter and Up To 3 Other Devices

EC1 73-0222 EIM PLUGSYS External Input Module Type 673

Electrical Stimulation

EC1 73-0221 PSM PLUGSYS Programmable Stimulator Module Type 676

EC1 73-0224 Software Module for PSM and PPG Control for Windows

EC1 73-0336 Plexiglass Platinum Electrode, D = 0.5 mm

For High Frequency EEG Measuring

EC1 73-0153 BPA PLUGSYS Biopotential Amplifier Module Type 675

EC1 73-3005 EEG Cable with Clips for BPA or EEGA

Laser Doppler Flowmeter and Flowprobes

EC1 73-3617 1-Channel Laser Doppler Blood Flow Monitor

EC1 73-3818 Fine Needle Probe MNP110

Data Acquisition with Computer

EC1 73-0161 HSE-HA Data Acquisition Hardware, PLUGSYS Version for Windows® NT/2000/XP

EC1 73-0223 DIM-D PLUGSYS Digital Bus Link for DIM Module Type 708/1

EC1 73-3004 HSE-HA NEURODYN Data Acquisition Software for Windows® NT/2000

EC1 73-3526 Software Option to NEURODYN for SEP Evaluation

Order # Product

Ventilator

EC1 73-3597 KTR-5 Ventilator, 230 VAC, 50 Hz

Alternative to EC1 73-3597

EC1 73-3645 KTR-5 Ventilator, 115 VAC, 60 Hz

EC1 73-2833 Tracheal Cannula for Small Rat, OD 2.0 mm, L 25 mm, Includes Medium Y-Adapter OD 7.5 mm

Stereotaxic Frame

EC1 72-4792 Lab Standard Stereotaxic Equipment for Rats (Dual Manipulator) Model 51603, with 18 Degree Ear Bars

Alternative to EC1 72-4792 if Laser-Doppler Flow Is Not Used

EC1 72-4790 Lab Standard Stereotaxic Equipment for Rats (Single Manipulator), Model 51600, with 18 Degree Ear Bars

Basic System Case for the Multiple Amplifier Modules

EC1 73-0045 PLUGSYS Basic System Case Type 603

EC1 73-0065 TAM-A PLUGSYS Transducer Amplifier Module Type 705/1

EC1 73-0089 ISOTEC Pressure Transducer, Range -50 to 300 mmHg

EC1 73-0098 Stand for ISOTEC

EC1 73-0096 Three-Way Stopcock Type 9560 R

EC1 73-0097 One-Way Stopcock Type 9500

To Connect Laser Doppler Flowmeter and Up To 3 Other Devices

EC1 73-0222 EIM PLUGSYS External Input Module Type 673

Clamping System for Carotid Artery

EC1 73-3528 Vessel Clamping System for Cerebral Autoregulation Evaluating

For High Frequency EEG Measuring

EC1 73-0153 BPA PLUGSYS Biopotential Amplifier Module Type 675

EC1 73-3005 EEG Cable with Clips for BPA or EEGA

Laser Doppler Flowmeter and Flowprobes

EC1 73-3617 1-Channel Laser Doppler Blood Flow Monitor

EC1 73-3818 Fine Needle Probe MNP110

Data Acquisition with Computer

EC1 73-0161 HSE-HA Data Acquisition Hardware, PLUGSYS Version for Windows® NT/2000/XP

EC1 73-0223 DIM-D PLUGSYS Digital Bus Link for DIM Module Type 708/1

EC1 73-3004 HSE-HA NEURODYN Data Acquisition Software for Windows® NT/2000

EC1 73-3527 Software Option to NEURODYN for Cerebral Autoregulation Evaluation

Please contact us for a system description according to your requirements

stimulation & recording

HSE-HA NEURODYN for Neurologic Studies



Previous



Next

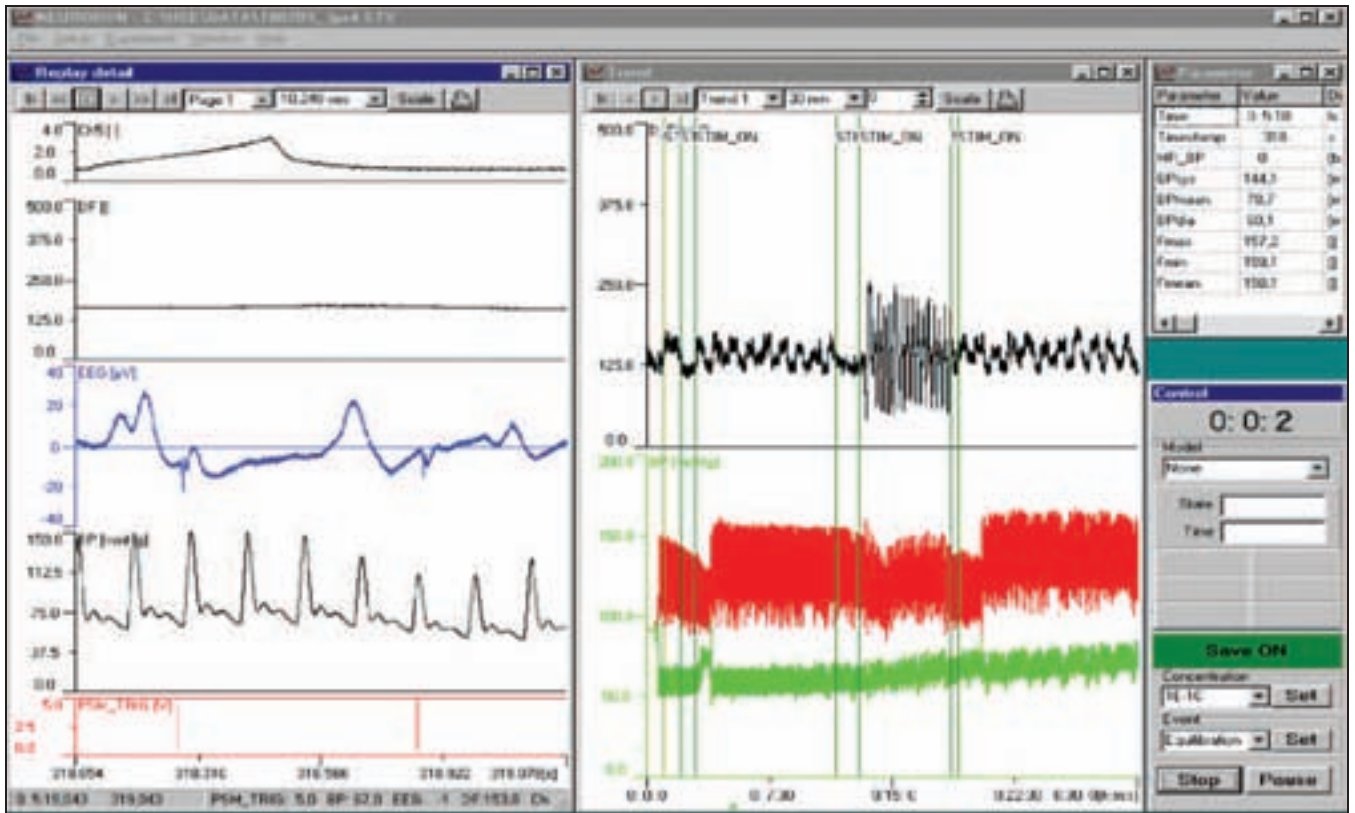
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- 16-channel data acquisition software for Neurologic experiments for Windows®
- To measure and evaluate signals such as EEG, aortic and venous blood pressure, aortic blood flow, pO₂, pCO₂, pH, temperature, etc.
- Can be extended to other haemodynamic and respiratory parameters
- Analysis of somatosensory evoked potentials and cerebral autoregulation as option available
- Easy to use, reduced settings by using configuration files
- Storage of raw data with possibility for replay — complete experiments can be replayed
- Indication of the measured signals and parameters online in numerical tabular form or graphical detail and trend windows
- Allows data exchange interface by converting the data into the ASCII delimited format
- Monitors the experimental sequence by placing event markers and concentration information
- Very easy graphical selection of specific data points by cursors for evaluation, data reduction and export
- Export of a raw data sequence into ASCII delimited format

Description

The HSE-HA NEURODYN software can be adapted to virtually any experimental investigation for neurologic experiments. Acquisition can cover signals such as EEG, aortic and venous blood pressure, aortic flow, pO₂, pCO₂, pH, temperature, etc. It can be extended to many other circulation or respiratory signals. Various parameters can be derived from these signals, e.g. systolic, diastolic, mean and heart rate, minimal, maximal, and mean flows, etc. During data acquisition, all acquired signals and derived parameters are stored on the hard disc and can be displayed on the screen. EEG analysis using FFT is done in the replay mode.

Dedicated options for controlling and evaluating somatosensory evoked potentials as well as cerebral autoregulation (or both) are available.

The HSE-HA NEURODYN software is available in a basic version which includes the minimal necessary algorithms that can be upgraded to a more complex system including all the available algorithms. The configuration of the system is defined in configuration files to reduce the amount of settings necessary and to ensure a stable and secure system. The user only needs to calibrate the signals and fix the graphics scaling. All the hardware definitions and algorithms used are defined in the configuration files. This reduces the amount of information necessary in the SOP and the possibility of wrong settings. The configuration files can be changed and the software used in combination with a set of different configuration files to match the different experiments.

HSE-HA NEURODYN for Neurologic Studies (continued)



Previous



Next



NEURODYN is a menu-controlled software and employs special algorithms to calculate the standard parameters. The HSE-HA NEURODYN software has a maximum of 16 channels, i.e. up to 16 different raw signals can be handled. The assignment of the signals to the individual channels is determined in the configuration files. The sample rate, the type of signals and the algorithm used for analysis are also defined in the configuration file. The arrangement of the graphic detail (raw signals) and trend (calculated parameters) is defined in the menu. The user has only to set up which of the available signals he wants to acquire and display, which of the possible parameters he wants to evaluate and display, enter the experimental protocol, and finally calibrate before he starts the data acquisition.

The HSE-HA Data Acquisition Hardware for NEURODYN software is available in three versions (see section I):

- **PLUGSYS Version**
- **Stand Alone Version**
- **USB Stand Alone Version**

Hardware requirements for NEURODYN:

The PLUGSYS, the stand alone or the USB version require the following computer hardware:

- **PC PENTIUM IV with 1 GHz or more with one free long PCI slot and USB 2.0**
- **RAM 256 Mbytes**
- **Operating System Windows® 2000/NT, XP or VISTA prof.**
- **Hard disk space – at least 100 Gbytes**
- **CD-ROM drive required**
- **17 or 19 inch flat panel monitor**
- **For data backup a CD or DVD recorder**

Commonly used signals on neurologic experiments are:

- **EEG Electroencephalogram**
- **AP Arterial Pressure**
- **VP Venous Pressure**
- **AF Arterial Blood Flow**

It is also possible to acquire other signals such as temperature. The maximum number of signals is 16.

The basic version of NEURODYN calculates the following parameters:

- **Online:**
 - **From All Pressure signals: Systolic, Diastolic and Mean Pressure, Heart Rate**
 - **From All Flows signals: Mean, Max. and Min. Flow**

After the experiment in replay mode:

- **From EEG:**
 - **FFT evaluation with power spectrum**
 - **Bandpass Filter display and evaluation for Alpha, Beta, Theta and Delta wave activity**

Optional software modules are available for:

- **Somatosensory stimulation control and evaluation only with PLUGSYS hardware and DIM-D**
- **Cerebral autoregulation control and evaluation only with PLUGSYS hardware**
- **Other cardiovascular signals**
 - **LVP module: LVPsys, LVPdia, LVPEDP, dP/dtmin, dP/dtmax, Heart Rate, Mean Pressure**
 - **LVP Advanced module: Tau, Time to Peak (Contractility Time), Relaxation Time and Contractility Index CI = dP/dtmax / P**
 - **Flow Advanced module: Endsystolic Flow, Enddiastolic Flow**
- **Respiration Module: Respiratory Rate, Max. Inspiratory Flow, Max. Expiratory Flow, Tidal Volume**

Specific parameters which are not mentioned in this list may available by special order.

Order #	Product
EC1 73-3004	HSE-HA NEURODYN Data Acquisition Software for Windows® NT/2000/XP
EC1 73-0161	HSE-HA Data Acquisition Hardware PLUGSYS Version
EC1 73-0235	HSE-HA Data Acquisition Hardware Stand Alone Version
EC1 73-3330	HSE-HA Data Acquisition Hardware USB Stand Alone Version
EC1 73-3526	Optional SEP Control and Evaluation Module
EC1 73-0223	DIM-D PLUGSYS Digital Bus Link for DIM
EC1 73-0221	PSM PLUGSYS Programmable Stimulator Module
EC1 73-3527	Optional Cerebral Autoregulation Control and Evaluation Module
EC1 73-3462	Optional LVP Module
EC1 73-0237	Optional LVP Advanced Software Module
EC1 73-0238	Optional Flow Advanced Software Module
EC1 73-0239	Optional Respiration Software Module

NEW BR Brain Microdialysis Probes



Previous



Next

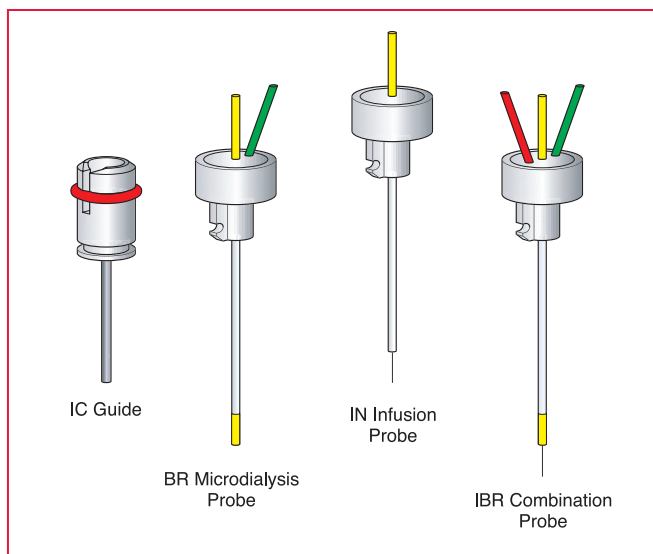
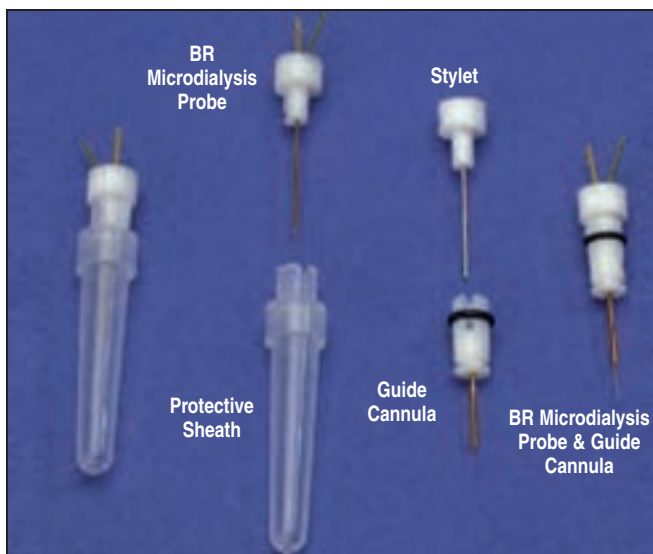
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



Microdialysis sampling was originally developed to study the chemistry of cerebrospinal fluid. The concept of continuous sampling by brain microdialysis was originally described at Yale University in 1972 ("Dialytrode for Long Term Intracerebral Perfusion in Awake Monkeys", J. Delgado, F. DeFeurdi, R. Roth, D. Ryugo and B. Mitruka, Arch Int. Pharmacodyn. (1972) 198: 9-21.) Neuroscientists have employed brain microdialysis as a monitoring tool for more than two decades. The use of a brain microdialysis probe is therefore the best developed of all possible applications.

Several different probe styles have been used. The original transcerebral probes consisted of a single length of dialysis tubing which stretched from one side of the head to the other. This approach integrated the chemical activity of all brain tissue in contact with the membrane but was not useful for differentiating the activity of individual brain regions. In loop probes a length of dialysis tubing was bent in half to form a smaller probe which could be inserted within specific brain tissues. These tended to be easy for researchers to construct, but still created more tissue damage than desirable. Pin probes, which depend on a small cylinder of dialysis membrane mounted on a thin cannula, were favored as the design creating less tissue damage. Pin probes evolved from the push-pull cannula technique originally developed by Gaddum for sampling of cerebrospinal fluid. The earliest published reference to a pin probe was at Emory University, in 1982 in a thesis written by R.D. Johnson working under Prof. J.B. Justice. Pin probes can be placed into the target tissue with the greatest accuracy. They can be removed and reinserted into guides mounted on the skull. BR probes manufactured by BAS use the pin design.

BR probes offer a small profile (340 micrometer OD) to minimize tissue damage and use a membrane with excellent recovery characteristics and a long shelf life (Polyacrylonitrile, MWCO = 30,000 daltons).

The BR Microdialysis Probe is shown above with its accessories. Starting at the left is a BR probe in the shipping vial. The probe can return to the vial for in vitro calibrations or short-term storage once wetted. The next view shows the probe removed from the vial. Notice the slot in the vial which secures the locking key on the probe head. The optional intracerebral guide is shown next with the stylet removed. The stylet

remains in place during stereotaxic insertion of the guide. It is removed just prior to insertion of the probe. The intracerebral guide is always placed just above the tissue to be studied. The probe is designed so that the membrane portion will extend beyond the end of the guide cannula. The target tissue will not be pierced until the probe is inserted in the guide for the first time. On the far right, a probe has been fully inserted into the guide. In this photograph, a rubber O-ring on the guide cannula is the feature which locks the probe. The rubber O-ring offers a "snap" fit and release. For studies in active animals, another type of guide cannula with a steel "Omega-ring" is used because of the strength of steel. The steel ring rotates to around the guide to lock or release the probe. Both types of guides permit the probe to be removed after the sampling experiment is completed and reinserted at another time. The combination of an O-ring guide and probe is completely non-metallic and suitable for NMR imaging. The Omega-ring guide is not used for NMR because of the steel in the Omega-ring.

BAS also offers a pin style brain microdialysis probe (model IBR) with an additional cannula which can be used for infusions or injections of fluids directly to the tissue being dialyzed. Although many drugs can be administered to the tissue via addition to the dialysis perfusion fluid, this approach requires extra effort to determine the actual dosage of drug delivered. Compounds with a molecular weight above the MWCO of the membrane are too large to be dialyzed into the tissue. The infusion cannula in the IBR probe is an open cylinder with a volume of 0.2 microliters. Fluid injected or infused into this cylinder will exit at the tip of the dialysis membrane and contact the tissue directly. An IBR probe is therefore suitable for injections of high molecular weight compounds such as dyes, proteins, DNA, RNA, carbohydrates, etc.

The IBR Microdialysis Probe permits the delivery of fluid directly to a tissue being dialyzed. This is accomplished by including a third cannula inside a brain microdialysis probe which exits from the tip of the probe. Fluid injected into the brain tissue through this cannula is likely to travel upwards, along the path created by insertion of the probe, and wash the tissue in contact with the dialysis membrane.

NEW BR Brain Microdialysis Probes (continued)



Previous



Next



Section Table of Contents



Main Table of Contents



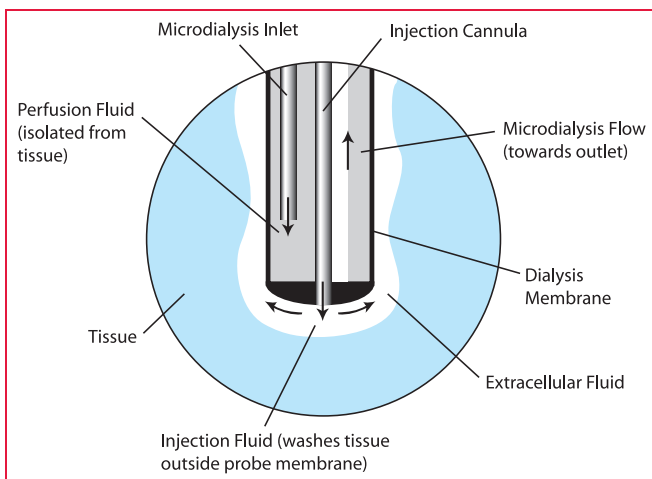
Search



WWW Home



Contact Us



Applications

- Monitor changes in levels of neurotransmitters or low molecular weight (< 5000 Da) chemicals in the brain of a conscious animal.
- Non-metallic probe and intracerebral guide (O-ring) facilitates NMR imaging of implant site.
- Standard BR probes are suitable for rodents such as rats, hamsters and guinea pigs.
- Custom BR probes may be constructed for larger animals with longer cannula and membranes.
- Use the IBR infusion/dialysis probe to deliver drug directly to brain tissue while simultaneously monitoring tissue response to drug.
- Probes may be sterilized by the user using ethylene oxide (ETO) gas or plasma peroxide.
- Use shipping vial for in vitro calibration and short-term storage.

IBR probes fit into the same intracerebral guides used for BR brain microdialysis probes. The color-coded injection cannula (red) uses the same type of flanged tubing connector used to connect FEP or PEEK tubing to the probe inlet (yellow) and outlet (green).

BAS Rturn software recorded animal activity during an experiment in which amphetamine was delivered directly to the striatum via an IBR probe, and biogenic amines were simultaneously monitored in dialysates from the same probe. The illustrations show the original Rturn data file, and graphs comparing left and right sensor data in 10 minute segments. In the Rturn, the left sensor signifies clockwise rotation and the right sensor signifies counter clockwise rotation.

Specifications

Cannula	Inert, biocompatible plastic
Cannula Length	15 mm
Probe Volume	2.1 to 2.3 µl (BR-2 or BR-4)
Use	Lock into optional intracerebral guide with rubber O-ring or steel Omega-ring, or mount directly on skull using acrylic cement
Fluid Connections	Flanged plastic connectors and FEP Teflon or PEEK tubing, separate purchase
Membrane	PAN. 320 µm OD, 2 or 4 mm lengths, standard, other membrane lengths available by special order
Storage	Store unopened blister trays at room temperature

Order # Product

EC1 72-6910	Brain Microdialysis Probes, BR-2, 2 mm Membrane, pkg. of 6
EC1 72-6911	Brain Microdialysis Probes, BR-4, 4 mm Membrane, pkg. of 6
EC1 72-6912	Combination Brain Microdialysis/Infusion Probes, IBR-2, 2 mm Membrane, pkg. of 6
EC1 72-6913	Combination Brain Microdialysis/Infusion Probes, IBR-4, 4 mm Membrane, pkg. of 6
EC1 72-6914	Brain Infusion Probes, 2 mm Infusion Cannula Extension, pkg. of 6
EC1 72-6915	Brain Infusion Probes, 1 mm Infusion Cannula Extension, pkg. of 6
EC1 72-6916	O-Ring Intracerebral Guide Cannula and Stylet, pkg. of 6
EC1 72-6917	Omega-Ring Intracerebral Guide Cannula and Stylet, pkg. of 6
EC1 72-6918	Calibration Station, In Vitro Stand with Two Probe Clamps
EC1 72-6896	Clamp Rod - Mounts Probe Clamp to Stoelting or other Stereotaxic Instruments
EC1 72-6919	Surgical Instruments Kit

Intracerebral Guide Cannula



Previous



Next

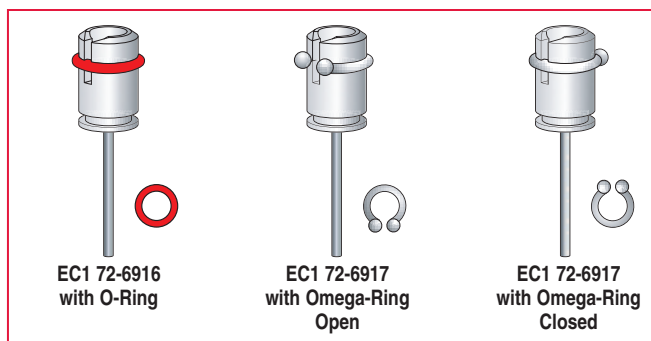
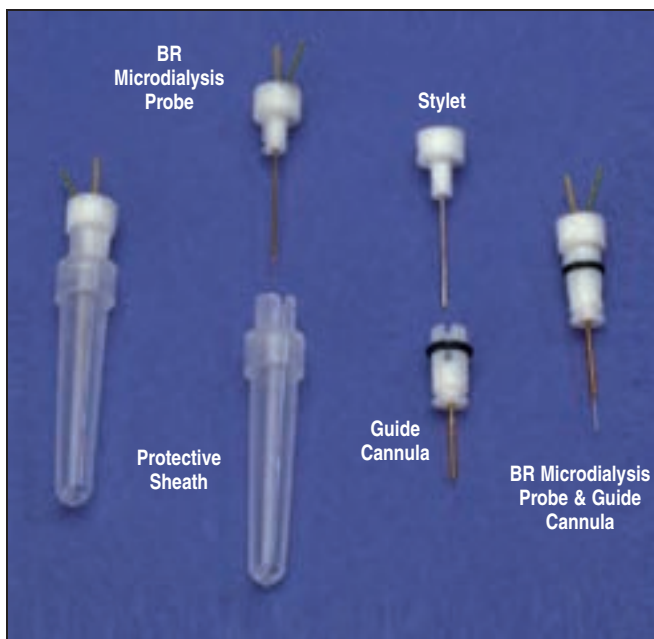
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- Permits insertion and removal of a single BR brain microdialysis probe
- The guide is positioned above the tissue that will be sampled by the probe and thus “targets” the site. The guide itself does not penetrate the tissue that is eventually sampled by the probe membrane
- Results in less damage to the brain: the tissue recovers faster, the microdialysis experiment begins sooner
- Completely non-metallic guide/probe pair
- A “lock” secures the probe yet allows for later removal
- May be ETO sterilized

This Intracerebral Guide Cannula targets an implant site and supports a microdialysis probe during in vivo sampling experiments in the brain. Guides are used for studies in awake, freely moving animals.

The guide is as long as the probe cannula. When a probe is placed inside, only the dialysis membrane extends beyond the end of the guide cannula. When the guide is implanted, it is placed just above the tissue that will eventually be sampled by microdialysis. After the animal recovers from the surgery (3-5 days), the edema will subside and ruptured blood vessels will have been sealed. Any glial cell formation will be restricted to the tissue disrupted by insertion of the guide and not the target site. Damage caused by insertion of the probe will be restricted to a small path that is the length and diameter of the dialysis membrane. This is considerably less trauma for the brain than the damage caused by drilling a hole in the skull, puncturing the dura, and then inserting the longer and wider intracerebral guide. In many cases, levels of targeted analytes will achieve steady state within a few hours. After sampling, the probe can be removed and reinserted at a later time.

The Intracerebral Guide Cannula can be mounted directly onto the skull using stereotaxic surgical techniques. It can be held by the clamp assembly as shown on the drawing above (far left). The clamp assembly mounts on the clamp rod which is in turn mounted onto the micromanipulator of the stereotaxic frame.

Specifications

Cannula	Inert, biocompatible plastic
Stylet	Stainless steel, removed when probe is inserted into guide
Cannula Length	10 mm
Lock	Rubber O-ring is standard, optional steel collar available for active animals by special order

Order # Product

EC1 72-6916	O-Ring Intracerebral Guide Cannula and Stylet, pkg. of 6
EC1 72-6917	Omega-Ring Intracerebral Guide Cannula and Stylet, pkg. of 6
EC1 72-6920	Clamp for BR Brain Probes
EC1 72-6896	Clamp Rod
EC1 72-6910	Brain Microdialysis Probes, BR-2, 2 mm Membrane, pkg. of 6
EC1 72-6911	Brain Microdialysis Probes, BR-4, 4 mm Membrane, pkg. of 6
EC1 72-6906	Dental Acrylic Cement
EC1 72-6900	Screw Bone Anchors, pkg. of 100
EC1 72-6901	Drill Bits for Screw Bone Anchors, pkg. of 5
EC1 72-6903	Trephine-Style Bone Drills, pkg. of 3
EC1 72-6921	High Speed Surgical Drill
EC1 72-6919	Surgical Instruments Kit

NEW Loop and Linear Microdialysis Probes



Previous



Next



Section Table of Contents



Main Table of Contents



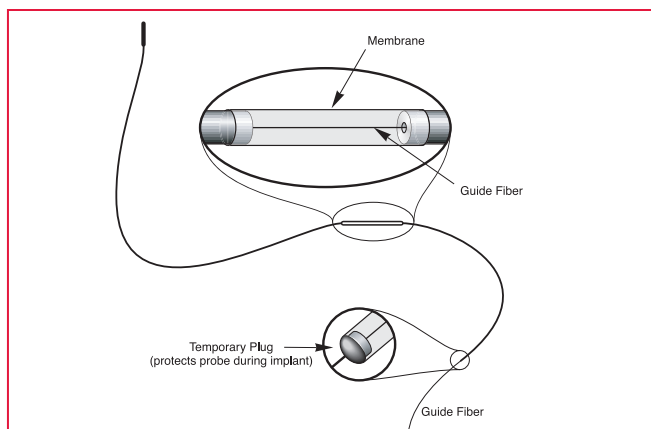
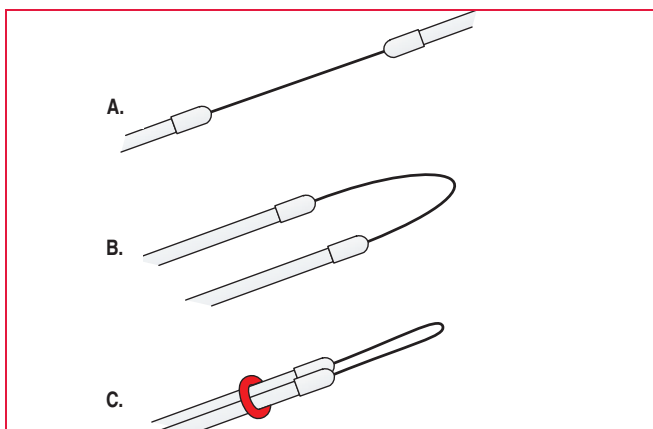
Search



WWW Home



Contact Us



Loop Microdialysis Probes have been designed for both in vivo studies (subcutaneous tissue, peritoneal cavity) in experimental animals and in vitro studies in aqueous solutions (tissue homogenates, cell suspensions, plasma, biological fluids). Although the profile of a Loop Microdialysis Probe is thicker than other linear probes, it is a stronger probe with more reinforcement at the joint. The Loop Microdialysis Probe is a good choice for many in vitro applications, teaching, and first-time users.

Linear Microdialysis Probes offer a small profile (320 μm OD) and are entirely flexible. Flexible plastic tubing brackets the membrane window. An internal fiber strengthens the probe and extends beyond the probe tubing to aid implantation in a variety of tissues including dermis, muscle, adipose tissue, liver and other organs. As shown in the figure above, the Loop Microdialysis Probe may be used in a linear approach (A), or folded in half to form a dialysis loop (B). A small slice of plastic tubing can be used to secure the loop (C) with the glue joints staggered to minimize the thickness of the looped probe.

Order # Product

EC1 72-6938	Loop Microdialysis Probe, DL-2, 2 cm Membrane for Loop or Linear Insertion, pkg. of 6
EC1 72-6939	Loop Microdialysis Probe, DL-5, 5 cm Membrane for Loop or Linear Insertion, pkg. of 6
EC1 72-6940	Loop Microdialysis Probe, DL-3, 3 cm Membrane, pkg. of 6
EC1 72-6941	Loop Microdialysis Probe, DL-1, 1 cm Membrane, pkg. of 6
EC1 72-6936	Tissue Introducer Needle
EC1 72-6907	FEP Teflon Tubing, 0.65 mm OD x 0.12 mm ID, 1 m (clear)
EC1 72-6908	Flanged Tubing Connectors (clear), pkg. of 20
EC1 72-6919	Surgical Instruments Kit

Custom probes available by special order.

The Linear Microdialysis Probe consists of a short length of hollow dialysis fiber attached to narrow-bore inlet and outlet tubes. An aqueous perfusion solution, which closely matches the ionic composition of the surrounding extracellular fluid, is pumped through the probe at a constant flow rate. Low molecular weight analytes diffuse in or out of the probe lumen. Large molecules such as proteins or protein-bound analytes are excluded by the membrane. Molecules entering the lumen are swept away by the perfusion fluid. This dialysate is then collected for analysis.

Linear Microdialysis Probes offer a small profile (320 μm OD) and are available with either 10 mm or 5 mm active lengths of dialysis membrane. Custom probes with other membrane lengths are also available. Flexible plastic tubing brackets the membrane window. Long inlet and outlet tubes facilitate subcutaneous externalization of the probes when used in awake animals. An internal fiber strengthens the probe and extends beyond the probe tubing to aid implantation. A plug seals the end of the probe from which the fiber skeleton extends. This plug keeps body fluids from entering the probe during surgery and is cut off before the probe is connected to a syringe pump and perfused. The linear probe is suitable for in vivo sampling from a variety of peripheral tissues, including dermis, subcutaneous tissue, muscle, adipose tissue, liver and other organs.

Order # Product

EC1 72-6932	Linear Microdialysis Probes, LM-10, 10 mm Membrane Window, pkg. of 6
EC1 72-6933	Spare Plastic Tubing for Probe End
EC1 72-6934	Linear Microdialysis Probes, LM-5, 5 mm Membrane Window, pkg. of 6
EC1 72-6935	Veterinary Bonding Glue, 3 ml
EC1 72-6936	Introducer Needle
EC1 72-6907	FEP Teflon Tubing, 0.65 mm OD x 0.12 mm ID, 1 m (clear)
EC1 72-6908	Flanged Tubing Connectors (clear), pkg. of 20
EC1 72-6919	Surgical Instruments Kit
EC1 72-6937	Tissue Matrix: 10 mm x 10 mm Chamber for Sectioning Dissected Tissue Into Slices for Postmortem Histology

Custom probes available by special order.

NEW IV Vascular Microdialysis Probe & In Vivo Ultrafiltration Sampling Probes



Previous



Next

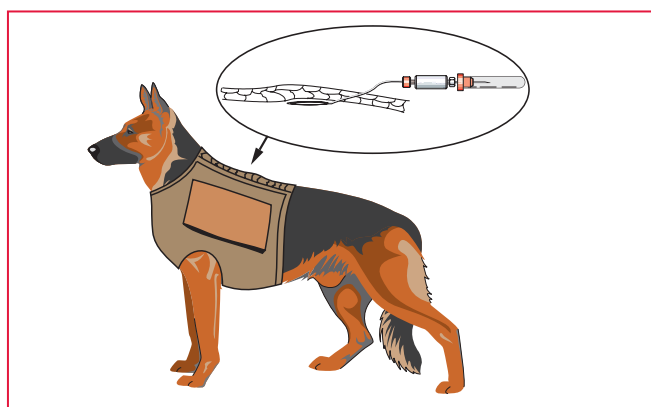
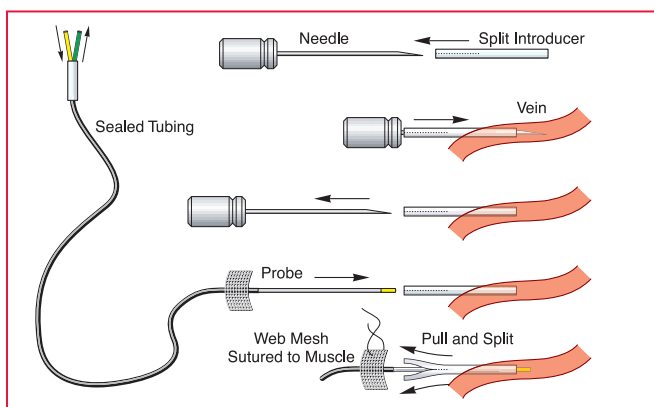
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



No study of pharmacokinetics, drug delivery, metabolism, or toxicity is complete without a determination of the drug concentration in blood. Blood sampling in small animals is necessarily limited by the volume of blood available. Sampling intervals of several hours are required to allow the subject to replenish fluids. Sampling frequency is therefore a primary advantage of vascular microdialysis. Since no blood or fluid is removed, the subject remains hydrated and the collected samples are more representative of a normal state.

IV Vascular Microdialysis Probes were designed for implantation into the rat jugular vein. They are also suitable for other soft tissues. Each probe includes a syringe needle and temporary cannula (split introducer) which aid placement. The thin-walled, plastic introducer slides over the syringe needle, which is then used to pierce the vein. The needle is removed and replaced with an IV Probe. A flexible wire mesh on the probe is sutured to the pectoral muscle. The cannula is then pulled out of the vein, leaving the probe behind. Inlet and outlet lines to the probe are housed within a single piece of flexible tubing, which is externalized by use of a surgical introducer needle.

The flexible probe, web, and connecting tube improve the comfort of a freely moving animal. The small OD of the probe is less likely to occlude the blood vessel.

Order #	Product
EC1 72-6929	Vascular Microdialysis Probe IV-5 with Needle and Introducer, 5 mm Dialysis Membrane, pkg. of 3
EC1 72-6930	Vascular Microdialysis Probe IV-10 with Needle and Introducer, 10 mm Dialysis Membrane, pkg. of 3
EC1 72-6931	Split Introducers for IV Vascular Microdialysis Probes, pkg. of 10
EC1 72-6919	Surgical Instruments Kit for Microdialysis, pkg. of 1

Microdialysis is not the only sampling method which relies on the use of an implanted semi-permeable membrane. Our In Vivo Ultrafiltration Probes utilize the same method. Microdialysis is an excellent method for monitoring changes in the concentration of a particular analyte, relative to some initial or basal level. However, when you are trying to determine the actual concentration of that analyte in the tissue itself, microdialysis methods require that you perform additional manipulations and extrapolate to determine that figure. In Vivo Ultrafiltration does not dilute the sample. Instead, it extracts the actual extracellular fluid and filters it to exclude high molecular weight compounds such as proteins. The concentration of an analyte in the ultrafiltrate represents the concentration of that analyte in the sampled tissue.

Ultrafiltration Probes are small, flexible tubes which can be sterilized and implanted subcutaneously into living animals. The surgery is simple, requiring the implant of the tubing under the skin through a needle-like introducer. A suture secures the probe. Once installed, an Ultrafiltration Probe can be used to painlessly remove fluid from the extracellular space of the surrounding tissue. A common vacutainer provides the motive force which pulls fluid through tiny probes in the probe membrane, up the probe tubing and into the vacutainer. The sampling rate is slow (1 to 3 mL/min) and can not exceed the rate at which the fluid is replaced by the blood vessels within the tissue. The fluid removed is clean, protein free and ready for immediate analysis. Whenever a new sample is needed, a new vacutainer is used. The vacutainer and probe tubing is protected in a lightweight jacket worn by the animal. Small creatures, such as laboratory rodents, are housed in the BAS Return system and continuously sampled.

How does In Vivo Ultrafiltration Work?

A small and flexible probe is inserted into the tissue. This probe contains a sealed loop of semi-permeable plastic membrane. The membrane has tiny pores (holes) which allow water, salts and low molecular weight molecules (with molecular weights less than 30,000 daltons) to pass through the membrane and into the probe. Proteins and other large molecules can not pass and are left in the tissue. Tubing connects the membrane loop to the outside of the body. As vacuum is applied to the tubing, often by something as simple as a vacutainer, extracellular fluid is collected as it filters through the membrane, up the tubing and into the vacuum chamber. The concept of in vivo ultrafiltration and the design of probes is covered by USA patents: 4,777,953; 4,854,322; and 5,002,054.

NEW In Vivo Ultrafiltration Sampling Probes



Previous



Next

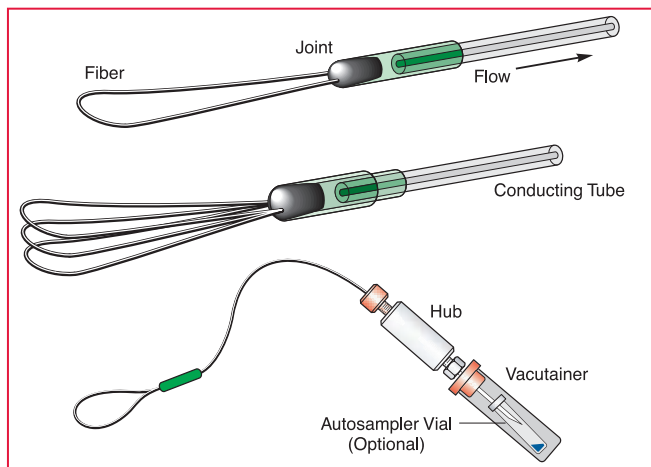
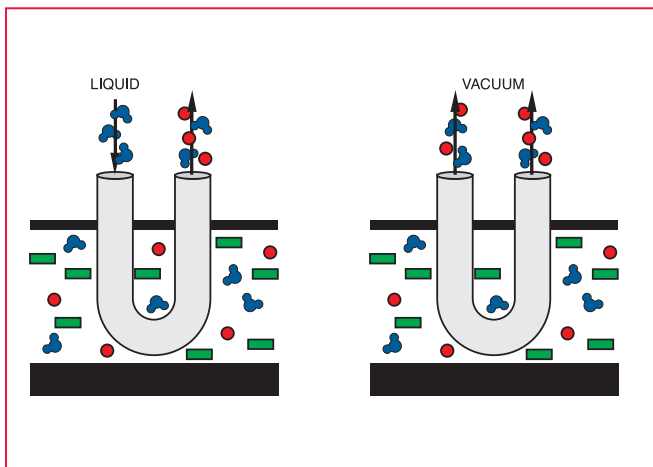
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



Glucose levels in ultrafiltrates collected from subcutaneous tissue parallel the blood glucose levels. Analysis can be conducted with the glucose strips and meters marketed for home use by human diabetics. The lack of proteins in the sample may, in techniques involving the use of a biosensor electrode, improve the reliability of the measurement. There is about a 30 minute lag time behind blood glucose levels due to the time required for the fluid to move down the probe tubing and into the collecting vessel. Studies have been conducted in dogs for periods of several months.

Alternative Vacuum Source

Ultrafiltration Probes require a vacuum source in order to extract fluid from the tissue which surrounds the probe. There are two options for creating a vacuum: a vacuum tube of the type used for collection of blood, or a peristaltic pump.

Vacuum tubes provide a portable collection method which requires no electrical power, cords or tethering. When the hub device pierces the septum of the tube, the vacuum inside the tube is extended within the probe and fluid flow begins. The tube is replaced with a new vacuum tube whenever another sample is needed. Vacuum tubes might typically be replaced every 30 to 60 minutes. Vacuum tube collection can be used with a tethered small animal, or a freely-roaming large animal. In larger animals (horses, dogs, pigs, sheep) the vacuum tube is usually taped to the skin. The vacuum tube and probe site are protected by a coat or covering as the animal roams freely. To collect ultrafiltrates using vacuum tubes, please order the Ultrafiltration Starter Kit.

Peristaltic pumps provide a more convenient way of sampling from smaller animals housed in a container such as the BAS Ratum system. They can also deliver the sample to an automated, refrigerated fraction collector such as the BAS HoneyComb Fraction Collector. We offer a small peristaltic pump with small ID tubing which can be used for ultrafiltration sampling. To use a peristaltic pump, either order the pump and connectors described below, or determine a way to modify your existing peristaltic pump to create a gas-tight connection to the 0.65 mm OD tubing on the Ultrafiltration Probe.

Probe Sizes

Ultrafiltration Probes use loops of membrane which are connected to a single collection tube. They are defined by the number of loops of

membrane and the length of membrane in each loop. For example, the model UF-3-12 probe has 3 loops of membrane and each membrane loop contains 12 cm of membrane. Therefore, a UF-3-12 probe offers 36 cm of available membrane surface for ultrafiltration. Use a probe like this if you want to get maximum flow and study a uniform tissue such as subcutaneous tissue. Since the membrane is formed into a loop, the loop length is half the membrane length. So in a UF-3-12 (EC1 72-6942) probe, the length of the loop is 6 cm. You would use an introducer needle to tunnel under the subcutaneous tissue for a distance of approx. 7 cm in order to insert this probe. The OD of this membrane is 320 micrometers. Other probes models are named in the same manner: UF-1-2 (EC1 72-6945) has one loop containing 2 cm of membrane, UF-3-8 (EC1 72-6943) has three loops each containing 8 cm of membrane, etc.

Order # Product

EC1 72-6942	Ultrafiltration Probes, UF-3-12, pkg. of 6
EC1 72-6943	Ultrafiltration Probes, UF-3-8, pkg. of 6
EC1 72-6944	Ultrafiltration Probes, UF-3-2, pkg. of 6
EC1 72-6945	Ultrafiltration Probes, UF-1-2, pkg. of 6
EC1 72-6946	Reinforced Ultrafiltration Probes, RUF-3-12, pkg. of 6
EC1 72-6947	Ultrafiltration Starter Kit
EC1 72-6958*	Vacutainers, 3 ml, pkg. of 12
EC1 72-6948*	300 µl Glass Sample Vials, pkg. of 12
EC1 72-6949*	Clearing Rod
EC1 72-6950*	Hub Assembly
EC1 72-6951*	Spare Hub Needle
EC1 72-6936*	Tissue Introducer Needle
EC1 72-6952*	Large Luer Syringe
EC1 72-6953*	Luer Needle for EC1 72-6952 Syringe
EC1 72-6954	Mini-Peristaltic Pump
EC1 72-6955	Space 0.020 Inch Peristaltic Tubing Set
EC1 72-6908	Flanged Tubing Connectors, pkg. of 20

* Included in EC1 72-6947 Starter Kit

Bone Ultrafiltration Probe



Previous



Next

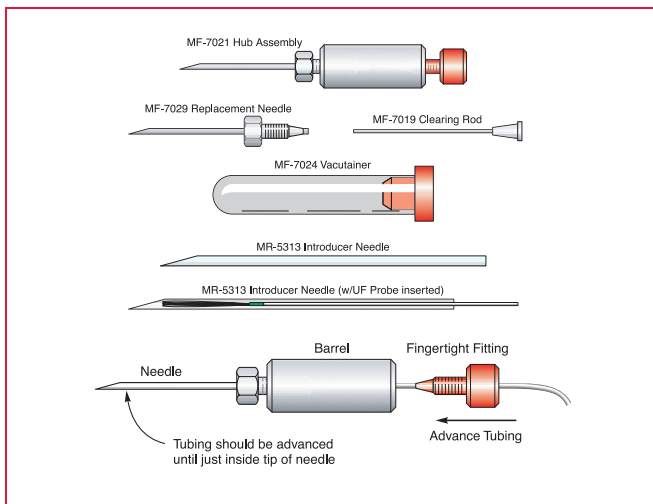
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- Ultrafiltration Probe
- Developed for NASA in collaboration with Purdue University
- Study chemical changes in bone interstitial fluid in vivo
- For use in larger animal models
- Permits long-term studies in the same subject

Some of the studies conducted by Purdue and BAS scientists using the new bone ultrafiltration probe include:

- **Measurement of baseline concentrations of the bone minerals, calcium, magnesium and phosphate in bone, skeletal muscle, subcutaneous tissue and blood.**
- **Measurement of changes in interstitial calcium, magnesium and phosphate in bone, skeletal muscle, subcutaneous tissue and blood after infusion of either calcium or EDTA.**
- **Study of the effect of different dietary levels of calcium on interstitial bone minerals.**

The Bone Ultrafiltration Probe consists of semi-permeable membrane fibers attached to a microbore conducting tube. The membrane fibers are implanted into the bone. On the tubing are two cuffs of porous material, which promote tissue growth and help stabilize the position of the probe. In addition to the cuffs, there are suture retainers at 5-cm intervals to further facilitate anchoring of the probe in place. A kink resistant sheath at the fiber-tubing junction facilitates subcutaneous tunneling of the probe at the bone exit site.

After the probe has been implanted into the bone, there are two methods of sampling from an implanted bone probe. For studies in freely moving unrestrained animals the probes can be connected to a needle hub (EC1 72-6957) which can be inserted into a Vacutainer™ (EC1 72-6958) to provide the negative pressure. For this sampling method animals wear jackets with pockets to hold the Vacutainers.



mini-pump is connected to the HoneyComb Refrigerated Fraction Collector.

Uses of the BAS Bone Ultrafiltration Probe

It has long been possible to study the changes in bone structure and mineralization in the living animal with the use of such physical measurements as x-ray and ultrasound. However, it has not previously been possible to monitor ongoing chemical changes in the extracellular fluid of bone in the living, moving animal. That will now be possible with the BAS Bone Probe (EC1 72-6956) developed by a collaborative effort of BAS and Purdue University Scientists.

The Bone Probe adds to the BAS line of specialty membrane probes, which allow sampling from many different tissues in the awake, living animals. These probes are designed to be used in large animals and can be used for studies lasting for several weeks. The bone probes can be used with a hub assembly and Vacutainers™ to permit complete mobility of the subject or with a small peristaltic pump to permit automated fraction collection

The Bone Probe was developed under a NASA contract using sheep as a model. NASA's interest in bone physiology is related to the problems of bone loss suffered by astronauts during protracted weightlessness. For humans to spend protracted periods in space and return to gravity to live healthy normal lives, it will be necessary to prevent the microgravity induced bone loss. In order to do this it will be necessary to understand the physical and chemical changes induced by microgravity and to develop methods to prevent these changes. Prevention of bone loss will involve the evaluation of the effectiveness of a number of counter measures, both physical, nutritional and pharmaceutical.

It has been possible to monitor changes in bone density and mineralization by traditional methods but monitoring the chemical changes in the interstitial fluid of bone over time in the living animal has not previously been possible. With this new device one can monitor most low molecular weight chemicals of 3 kDa or less.

Order # Product

EC1 72-6956	Bone Ultrafiltration Probe
EC1 72-6957	Fingertight Fitting for Hub Assembly
EC1 72-6958	Vacutainer, 3 ml, pkg. of 12
EC1 72-6954	Mini-Peristaltic Pump for Ultrafiltration
EC1 72-6909	Honeycomb Fraction Collector

Microdialysis Round Bottom Bowl Kits



Previous



Next

Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



Microdialysis Round Bottom Bowl Kit

This round bottom bowl has been used for housing animals (rats or mice) for microdialysis or ultrafiltration studies where it is not necessary to collect urine and feces and where it is desirable for the animal to be housed with bedding vs. a wire mesh floor. This cage has been used for over 15 years in laboratories around the world. It is THE standard for microdialysis, there being no components which will interfere with an exteriorized brain probe.

EC1 72-6922 Microdialysis Round Bottom Bowl Kit Includes:

- Round Bottom Bowl
- Rodent Water Tube
- Microdialysis Bowl Lid

Order #	Product
EC1 72-6922	Microdialysis Round Bottom Bowl Kit (For Use with Rats or Mice)
EC1 72-6923	Round Bottom Animal Bowl Only
EC1 72-6924	Lid Only for Round Bottom Animal Bowl
EC1 72-6925	Water Tube for Round Bottom Animal Bowl, Glass with Glass Sipper

Microdialysis Round Bottom Bowl Kit with Access Panel

This round-bottomed bowl is used for caging rodents during microdialysis applications. It has a removable access panel to facilitate dosing, insertion of intracerebral probes and connection of IV catheters. This cage is intended for use with bedding materials. An access hole and stainless steel spring have been added for (user's choice) internal or external mounting of the included water tube (EC1 72-6928). An optional cage lid is available to discourage escapes.

Order #	Product
EC1 72-6926	Microdialysis Round-Bottomed Bowl with Access Panel for Dosing with Internal Water Bottle Mounting
EC1 72-6927	Microdialysis Round-Bottomed Bowl with Access Panel for Dosing with External Water Bottle Mounting
EC1 72-6924	Lid Only for Microdialysis Round Bottom Bowl
EC1 72-6928	Autoclavable Polycarbonate Plastic Water Tube with SS Sipper

Angle One™ and Angle Two Stereotaxic Instrument - Autocalculation of Target Structure



Previous



Next

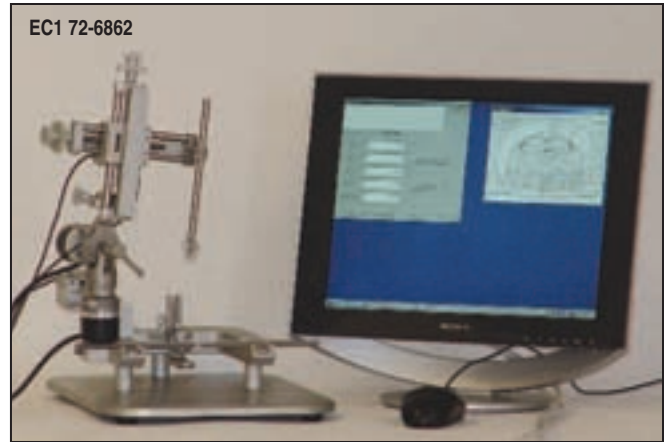
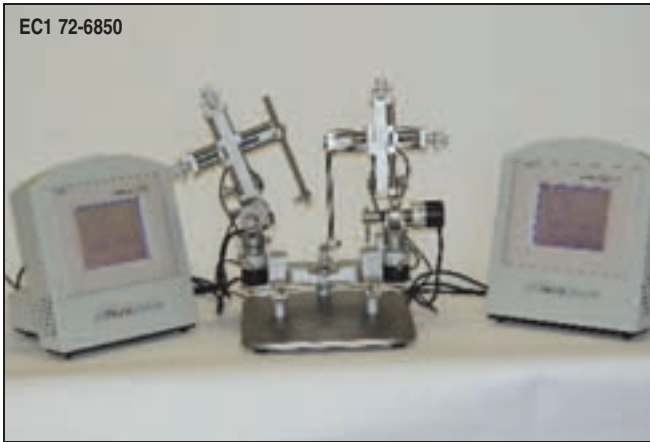
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- Single or dual manipulator models available
- Easily vary the angle of approach
- Automatically calculates the new coordinates of your target structure
- Digital atlas integration

- The Angle Two™ offers the added feature of fully integrated digital Paxinos atlas via a 17 inch flat screen control panel. Integration meaning the researcher can click on the atlas page of the target point desired, and the software will illustrate and map out the path.
- Simply Set Target and set the zero point on the control panel. The main screen displays the distance to the target point along each of the 3 axis given the rotation, tilt, and angle. These displayed distance numbers will count down to zero as the target is approached.

The new Angle One™ and Angle Two Stereotaxic Instruments are the most technologically advanced animal stereotaxic instruments manufactured. They allow you to easily vary the angle of approach and it automatically calculates the new coordinates of your target structure.

Now you can improve the rigor and interpretation of your stereotaxic research without adding the extensive calculations and risk of error to the protocol. The Angle One solves these problems.

The Angle series performs as follows:

- The display panel or stereotaxic systems software has a number and zeroing button for each of the three linear axes and the two angle measurements.
- Angle transducers (optical encoders) continuously display the angle position.
- Angle displays will be zeroed once at the vertical position and will remain set as long as the power is on.
- The manipulator is then tilted to the desired position with the angles displayed on the screen.
- The probe is moved to Bregma and the linear displays are zeroed.
- Scrolling buttons (up & down) are then used to enter the target in reference coordinates on the three linear axes displays.
- These target coordinates are stored and saved until reset. During the next surgery, they will reappear by simply pressing a button.
- By subsequently pressing mode button, the linear displays will switch from the target coordinates in the reference frame to the target coordinates in the new tilted, non-orthogonal frame.
- As the target is approached, the display counts down to zero.

With the Angle series, it is easy to set the manipulator at any arbitrary angle and reach the same target point every time. No pilot studies. No calculations. Standard atlas coordinates. Every surgery in a group can be performed from a different angle— completely undoing the traditional confounding with experimental groups.

The Angle series incorporates a fine drive and advanced features.

Order #	Product
EC1 72-6850	Dual Angle One™ Stereotaxic Instrument
EC1 72-6851	Single Angle One™ Stereotaxic Instrument
EC1 72-6862	Angle Two™ Stereotaxic Instrument with Paxinos Atlas
EC1 72-6863	Angle Two™ Stereotaxic Instrument with Mouse Atlas
EC1 72-6864	Angle Two™ Dual Stereotaxic Instrument with Atlas
EC1 72-6865	Mouse Atlas Software for Angle Two
EC1 72-6866	Rat Atlas Software for Angle Two
EC1 72-6867	Hamster Atlas Software for Angle Two

Digital Lab Standard Stereotaxic Equipment



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us



- Saves time
- Improves accuracy

This latest innovation in Standard™ Stereotaxic Instruments features a sealed electronic sensor to each axis of the manipulator arm. This sensor is highly immune to outside interference and environmental conditions. Measurements are accurate to 10 microns in all three directions. Movements in all three directions are now monitored by a large, easy-to-read LED display module, with a resolution selectable from 1 mm to 10 microns.

A zeroing function allows the user to set a reference point for targeting specific coordinates on the animal's skull for injection, implantation, etc. Calculation of distance measurements via the vernier scales is thus no longer necessary...saving the user valuable time and improving accuracy.

The classic design and high quality of our conventional Lab Standard™ manipulators are exactly the same on the new Digital Stereotaxic, with no drift and smooth movements. The Digital Lab Standard™ keeps the custom triple-start lead screws to allow fast positioning, while maintaining consistently smooth movement. The thin cords from the sensors do not interfere with movements, allowing the arm to move freely and be set at any angle.

Your Choice of Three Options

1. **New Digital Lab Standard™ Stereotaxic Instrument complete with LED Digital Display.**
2. **Add new Digital Manipulator Arms and an LED Display to your current Lab Standard™ or similar brand of stereotaxic.**
3. **Convert your existing Lab Standard™ (or most other brands) by adding digital sensors to your existing manipulator arms (factory installed). LED Display Module included.**

Zeroing Function for Targeting Specific Coordinates

The display of each axis can be "ZERO"ed at any location, making operation simple and straightforward. To target a specific location, start at Bregma, and reset all coordinates to zero. Move the manipulator arm to the desired point and lower the electrode, probe, or micropipette into place.

Memory

Target coordinates can be programmed into the memory of the EC1 72-6035 and EC1 72-6037 Digital Lab Standard™ Stereotaxics.

Versatility of Positioning

The universal joint allows the investigator to angle the probe in either the anterior-posterior or the lateral-medial planes. The improved locking mechanism on the Lab Standard™ Stereotaxic Instruments will hold any angled position without slippage. Of course, it also provides an absolute lock at the vertical position. The manipulator arm may be swiveled out of the way for convenience in installing the animal or performing a procedure, then returned to the same point reliably with the aid of the locking face block above the swivel joint.

Accessories

All of the accessories for the Lab Standard™ Small Animal Stereotaxic Instruments fit the EC1 72-6035 through EC1 72-6038 Digital Lab Standard™ Small Animal Stereotaxic Instrument. Probe holders and species adapters for "U" frame stereotaxic instruments made by other manufacturers are generally compatible with the Lab Standard frame.

The EC1 72-6035 and EC1 72-6037 Digital Lab Standard™ Small Animal Stereotaxic Instruments come complete with a standard probe holder with corner clamp, a Rat Adapter with nose holder and 18 degree taper ear bars. The EC1 72-6036 and EC1 72-6038 include the non-puncture (45°) ear bars instead of the 18-degree ear bars. They are otherwise identical to the EC1 72-6035 and EC1 72-6037.

The time-proven U-Frame design concept, rugged construction, and adaptability to most species used in the lab make The Lab Standard™ series the best choice for stereotaxic instruments.

Order # Product

Complete System

EC1 72-6035	Digital Lab Standard™ Stereotaxic with LED Display, 18° Ear Bars
EC1 72-6036	Digital Lab Standard™ Stereotaxic with LED Display, 45° Ear Bars
EC1 72-6037	Digital Dual Manipulator Lab Standard™ Stereotaxic with LED Display, 18° Ear Bars
EC1 72-6038	Digital Dual Manipulator Lab Standard™ Stereotaxic with LED Display, 45° Ear Bars

Digital Manipulator Arm and LED Display

EC1 72-6039	Digital Manipulator Arm, 3 Axis, Left Hand, and LED Display
EC1 72-6040	Digital Manipulator Arm, 3 Axis, Right Hand, and LED Display

Existing Manipulator Arm Conversion, 3 Axis

EC1 72-6041	Factory Conversion of Existing Left Hand Manipulator Arm to Digital Plus LED Display
EC1 72-6042	Factory Conversion of Existing Right Hand Manipulator Arm to Digital Plus LED Display

Our Nanomite Syringe Pump will fit on the Manipulator Arm of our Stereotaxic Frames, see pumps page 10.

stereotaxic frames

NEW Just for Mice Digital Stereotaxic Instrument



Previous



Next

Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- Two stereotaxic frames in a single base
- Accuracy to 10 microns
- Ear bars include independent height adjustment
- Triple lead screw for fast positioning
- Also ideal for neonatal rats and other small animals

The Just For Mice™ Stereotaxic Instrument was developed for the expanding growth of research being conducted with knock-out and transgenic mice. This system is ideal for researchers in need of a versatile, reliable instrument for stereotaxic procedures with mice and other small rodents. It allows the user to perform surgical procedures on two mice at one time. Precision alignment when using the Just For Mice™ ensures accurate placement of electrodes, micropipettes, and other devices.

The Just For Mice™ is the only instrument especially for mice, and offers several advantages over competing "made for mice" instruments:

Dual Units: The Just For Mice™ is two stereotaxic instruments on a single base. The base is 10" x 17" and has two ear bar slots located on each side. A tooth bar and nose clamp secures the nose. A single manipulator arm controls mediolateral and vertical positioning via lead screws, and antero-posterior movement via dovetail slide movement, with 80mm of travel possible in each direction, allowing access to both ear bar locations.

Unique, light ear bars: Ear bars may be independently adjusted in height - a unique feature of this stereotaxic instrument - to level the skull. Laser engraved scales show the vertical positions of the ear bars. Model organisms with soft skulls, such as the mouse and the neonatal rat, can now be secured firmly in with this system. The EC1 72-6048 Just For Mice™ Stereotaxic Instrument comes complete with lightweight delrin ear bars with tapered points for each station.

Specifications

Accuracy	10 microns
Animal	Mice and Neonatal Rats
Ear Bar Height	Adjustable
Length English	17 in
Width English	10 in

Order # Product

EC1 72-6048 Just for Mice™ Digital Stereotaxic Instrument

Convert your existing Stereotaxic Frame into a Digital System. See page 29. We can convert most brands. Contact us for further details.

**For Bone Drills, see page 41.
For Bone Rongeurs and other Surgical Instruments,
see Surgical Tables & Tools.**

New Digital Coordinates Readout Saves Time and Improves Accuracy

Now all of our Standard Stereotaxic Frames below are available with a digital display. For information on upgrading your current systems or for complete digital systems, contact your local distributor.

Traditional Stereotaxic Systems

- All scales are oriented to be read easily from the open end of the "U" (the preferred position for most researchers)
- Larger numbers on the scale line for easy readability
- Finely engraved lines for precise alignment with facing scales, for accurate resolution to 0.1mm
- Scale laser engraved for reliable, consistent quality
- All this and affordable too!

Small Species Systems

Large Species Systems



■ = Small Species Single Manipulator Systems EC1 72-4790 & EC1 72-4791

■ = Small Species Dual Manipulator Systems EC1 72-4792 & EC1 72-4793

■ = Large Species 4 Manipulator Systems EC1 72-4798 & EC1 72-4800

Std. System with 18° Ear Bars for Rat	Std. System with 45° Ear Bars for Rat	Std. System with 18° Ear Bars for Rat	Std. System with 45° Ear Bars for Rat	Standard System for Cat/Monkey	Standard System for Dogs
---------------------------------------	---------------------------------------	---------------------------------------	---------------------------------------	--------------------------------	--------------------------

* Note: Indicates required part number

Select Your Species	EC1 72-4819 or EC1 72-4794	EC1 72-4819 or EC1 72-4794	EC1 72-4819 or EC1 72-4794	EC1 72-4819 or EC1 72-4794	EC1 72-4819	EC1 72-4819
Mouse						
Rats	as listed	as listed	as listed	as listed	*EC1 72-4817	*EC1 72-4817
Guinea Pig	*EC1 72-4820	*EC1 72-4820	*EC1 72-4820	*EC1 72-4820	*EC1 72-4821	*EC1 72-4821
Small Birds	*EC1 72-4827	*EC1 72-4827	*EC1 72-4827	*EC1 72-4827	*EC1 72-4828	*EC1 72-4828
Cats	*EC1 72-4822 or EC1 72-4823	*EC1 72-4822 or EC1 72-4823	*EC1 72-4822 or EC1 72-4823	*EC1 72-4822 or EC1 72-4823	as listed	*EC1 72-4824 or *EC1 72-4825
Monkey	*EC1 72-4822 or *EC1 72-4823	*EC1 72-4822 or *EC1 72-4823	*EC1 72-4822 or *EC1 72-4823	*EC1 72-4822 or *EC1 72-4823	as listed	*EC1 72-4824 or *EC1 72-4825
Dogs	n/a	n/a	n/a	n/a	*EC1 72-4826	as listed

System Components

Micromanipulators	Order #	1	1	1	1		
Left Hand, 51604	EC1 72-4855	1	1	1	1		
Right Hand, 51606	EC1 72-4856			1	1		
Left Hand, 51804	EC1 72-4804					2	2
Right Hand, 51806	EC1 72-4805					2	2
Ear Bars							
18° Ear Bars, 51611	EC1 72-4838	1		1			
45° Ear Bars, 51612	EC1 72-4839		1		1		
Probe Holders							
Standard Probe Holder with Corner Clamp, 51631	EC1 72-4829	1	1	1	1		
Animal Adaptors							
Rat, 51621	EC1 72-4815	1	1	1	1		
Cat / Monkey Adaptor with 18° Ear Bars, 51826	EC1 72-4822					1	
Dog/Monkey with Ear Bars, 51852	EC1 72-4826						1
Other Components							
Parallel Rail Frame Assembly Only	EC1 72-4799					1	1
Universal 4"x4" Mounting Support Stand	EC1 72-4797					1	1
Model		51600	51650	51603	51653	51800	51850
Order #		EC1 72-4790	EC1 72-4791	EC1 72-4792	EC1 72-4793	EC1 72-4798**	EC1 72-4800**
See page		33	33	33	33	34	34

** Note: Must select a base plate to complete system, either 13 x 17" (EC1 72-4802) or 12 x 36" (EC1 72-4803)

stereotaxic frames

Traditional Frames

Stereotaxic System Components & Compatibility



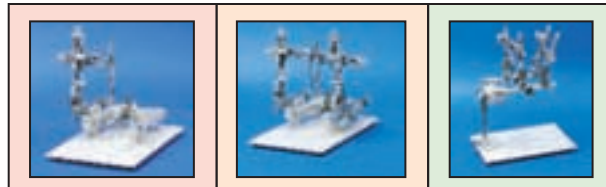
Previous



Next



- = Small Species Single Manipulator Systems EC1 72-4790 & EC1 72-4791
- = Small Species Dual Manipulator Systems EC1 72-4792 & EC1 72-4793
- = Large Species Four Manipulator Systems EC1 72-4798 & EC1 72-4800



Order #	Product Description	Compatible With		See Page
Micromanipulators				
EC1 72-4855	Left Hand, 51604	•	•	31
EC1 72-4856	Right Hand, 51606	•	•	31
EC1 72-4804	Left Hand, 51804		•	34
EC1 72-4805	Right Hand, 51806		•	34
Ear Bars				
EC1 72-4838	Rat 18° Ear Bars, 51611	•	•	37
EC1 72-4839	Rat 45° Ear Bars, 51612	•	•	37
EC1 72-4842	Cat 18° Ear Bars, 51613	•	•	37
EC1 72-4843	Cat 45° Ear Bars, 51614	•	•	37
EC1 72-4840	Rat 18° Ear Bars, 51811		•	37
EC1 72-4841	Rat 45° Ear Bars, 51812		•	37
EC1 72-4844	Cat 18° Ear Bars, 51813		•	37
EC1 72-4845	Cat 45° Ear Bars, 51814		•	37
Probe Holders				
EC1 72-4829	Standard Probe Holder with Corner Clamp, 51631	•	•	38
EC1 72-4830	Standard Probe Holder with Side Clamp, 51632	•	•	38
EC1 72-4831	Standard Probe Holder with "C" Clamp, 51634	•	•	38
EC1 72-4832	Large Probe Holder, 51633	•	•	38
EC1 72-4835	Microdialysis Probe Holder, 51637	•	•	38
EC1 72-4836	Microdialysis Probe Holder, 51637-2.0	•	•	38
EC1 72-4737	Cannula Holder, 51636	•	•	38
Animal Adaptors				
EC1 72-4794	Cunningham Mouse & Neonatal Rat Adaptor, 51625	•	•	33
EC1 72-4811	Cunningham Spinal Adaptor Mouse, 51690	•	•	36
EC1 72-4812	Cunningham Spinal Adaptor Rat, 51695	•	•	36
EC1 72-4819	Mouse Adaptor, 51624 (no ear bars)	•	•	33
EC1 72-4815	Rat Adaptor with 18° Ear Bars, 51621	•	•	33
EC1 72-4817	Rat Adaptor with 18° Ear Bars, 51821		•	33
EC1 72-4816	Rat Adaptor with 45° Ear Bars, 51620	•	•	33
EC1 72-4818	Rat Adaptor with 45° Ear Bars, 51820		•	33
EC1 72-4827	Small Bird Adaptor with 45° Ear Bars, 51623	•	•	36
EC1 72-4828	Small Bird Adaptor with 45° Ear Bars, 51823		•	36
EC1 72-4820	Guinea Pig Adaptor with 45° Ear Bars, 51622	•	•	36
EC1 72-4821	Guinea Pig Adaptor with 45° Ear Bars, 51822		•	36
EC1 72-4822	Cat / Monkey Adaptor with 18° Ear Bars, 51626	•	•	36
EC1 72-4823	Cat / Monkey Adaptor with 45° Ear Bars, 51627	•	•	36
EC1 72-4824	Cat / Monkey Adaptor with 18° Ear Bars, 51826		•	36
EC1 72-4825	Cat / Monkey Adaptor with 45° Ear Bars, 51827		•	36
EC1 72-4826	Dog/Monkey Adaptor with Ear Bars, 51852		•	36
Other Components				
EC1 72-4799	Parallel Rail Frame Assembly Only, 51801		•	34
EC1 72-4797	Universal Mounting Support Stand, 51680	•	•	34
EC1 72-4846	Probe Centering Device, 51607	•	•	38
EC1 72-4847	Centering Stand, 51878		•	37
EC1 72-4848	Stereomicroscope Kit, 51608	•	•	37
EC1 72-4853	Gas Anesthesia Mask Adaptor Rats, 51610	•	•	34
EC1 72-6043	Gas Anesthesia Platform for Mice, 50266	•	•	37

Lab Standard™ Stereotaxic Instrument

Traditional Frames



Previous



Next

Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



Lab Standard Stereotaxic Frame



Dual Lab Standard Stereotaxic Frame

- Available for mice or rats
- Numerals on scales are larger and easier to read
- Laser engraved scale lines provide precise position to 0.1 mm
- Absolute lock at 90°
- Available both in single and dual manipulator models

Smooth Movements

The Lab Standard's custom, triple-start lead screws allow the fastest positioning possible consistent with lining up the scales easily for a given position.

The universal joint allows the investigator to angle the probe in either the anterior-posterior or the lateral-medial planes. The improved locking mechanism on the Lab Standard Stereotaxic Instruments will hold any angled position without slippage. Of course, it also provides an absolute lock at the vertical position. The manipulator arm may be swiveled out of the way for convenience in installing the animal or performing a procedure, then returned to the same point reliably with the aid of the locking face block above the swivel joint.

Easy-to-Read Scales

All scales are oriented to be read most easily from the open end of the "U". This is the position from which most operators prefer to work. The numerals on the scales are larger and therefore more readable than on competing units. The scale lines are very finely drawn to allow precise alignment with facing scales, and are laser engraved for reliable, consistent quality.

Species

These Stereotaxic Frame Systems are supplied with the necessary components to work with rats. In order to work with other species the appropriate adaptor must be purchased separately. See pages 34 and 36 for the most advanced species adaptors.

Single and Dual Manipulator Models

The time-proven U-Frame design concept, rugged construction, and adaptability to most species used in the lab make this the best choice for a stereotaxic instrument. The Lab Standard 51600, manufactured by Stoelting, offers several advantages over other U-Frame stereotaxic instruments.

Dual Manipulator Model

The 51603 and 51653 Dual Manipulator Lab Standard are configured with 3-dimensional manipulator arms on both sides. The second manipulator arm is properly reversed as to handedness.

Accessories

Both the 51600 and 51603 come complete with a standard probe holder with corner clamp (51631), a Rat Adaptor (51621) with nose holder and 18 degree taper ear bars. The 51650 and 51653 include the non-puncture 45 degree ear bars instead of the 18 degree ear bars. They are otherwise identical to the 51600 and 51603.

Optional accessories are available. Probe holders and species adaptors for "U" frame stereotaxic instruments made by other manufacturers are generally compatible with the Lab Standard frame. If you are new to stereotaxic surgery, we would recommend you purchase EC1 72-4240 Stereotaxic Surgery in the Rat.

Order #	Model	Product
EC1 72-4790	51600	Lab Standard Stereotaxic Frame for Rats with 18° Ear Bars
EC1 72-4791	51650	Lab Standard Stereotaxic Frame for Rats with 45° Ear Bars
EC1 72-4792	51603	Dual Lab Standard Stereotaxic Frame for Rats with 18° Ear Bars
EC1 72-4793	51653	Dual Lab Standard Stereotaxic Frame for Rats with 45° Ear Bars
EC1 72-4796	51601	U-Frame, Base Plate and Rat Adaptor without Manipulator Arm
EC1 72-4797	51680	Tilt/Rotatable Stand for 51600
EC1 72-4794	51625	Cunningham™ Mouse Adaptor, see page 35
EC1 72-4240	–	Stereotaxic Surgery in the Rat

Large Animal Stereotaxic and Mask Adapters

Traditional Frames



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us



Lab Standard Large Animal Stereotaxic Equipment

- Reliable locks
- Laser engraved scales
- Affordably priced

The Lab Standard™ Large Animal Stereotaxic Instrument provides superior performance. Up to four manipulator arms may be conveniently positioned on the

two parallel rails. Thus, several probes may be independently positioned in one animal.

Easily Read Scales

Precise, laser engraved graduation lines allow vernier scales to be aligned to a higher degree of accuracy than with other makes of stereotaxic instruments. The numbers are oriented to enhance readability from common user positions.

Reliable Locks

It is at times necessary to tilt the stereotaxic frame to gain access to the animal's side or underside. A novel locking mechanism makes this tilt both easy to accomplish, and secure.

The tilting and angling universal joint on Lab Standard manipulators have the most secure, reliable locks of any stereotaxic instrument.

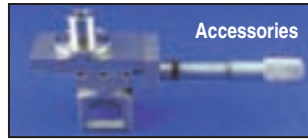
Components Included

The 51800 comes equipped with:

- Two 51804 L.H. Manipulators
- Two 51806 R.H. Manipulators
- One 51826 Cat/Monkey Head Holder with 18° Ear Bars or One 5182 Dog/Monkey Adaptor
- One 51801 Parallel Rail Frame
- One 51680 4 x 4 in mounting supportstand.

Base plates are ordered separately. Adaptors for rat, mouse and other species are available.

The 51851 Dog Frame is longer, includes a highly adjustable dog head holder, and 2 sets of ear bar blocks to allow configuration for large dogs.



Accessories

Accessories

The scales for the 51800 series earbars are in a different position than on the 51600 series. All species adaptors and earbars

manufactured by Stoelting are available for the 51600 and 51800 series of stereotaxic instruments, except the Dog Adaptor 51852.

The 51858 A-P Microdrive (pictured above) provides fine movement control in the anterior posterior dimension with 25 mm. range and 10µm graduations. It mounts between the rails and the manipulator. The 51858 includes a longer probe holder shaft to compensate for the extra height.

Base Plates

To complete your Stereotaxic Frame you must purchase a base plate. Two different plates are available. The 51872 base plate has slots for mounting other instruments on the same base with a 51800 series stereotaxic. The 51871 is a 13 x 17 in flat base plate without slots. A 4 x 4 in mounting plate with 2 sets of four mounting holes is included with the 51800 series stereotaxics. One set of holes is on 2 in centers and the other set is on 3.5 in centers.

Order #	Model	Product
EC1 72-4798	51800	Stereotaxic Frame for Cat/Monkey, Complete with 4 Manipulators
EC1 72-4799	51801	Parallel Rail Frame Assembly Only
EC1 72-4800	51850	Stereotaxic Frame for Dog, Complete with 4 Manipulators
EC1 72-4801	51851	Stereotaxic Frame Assembly Only, Dog
EC1 72-4802	51871	Base Plate, 13 in x 17 in
EC1 72-4803	51872	Base Plate, Slotted, 12 in x 36 in
EC1 72-4804	51804	Manipulator, LH
EC1 72-4805	51806	Manipulator, RH
EC1 72-4806	51858	A/P Microdrive
EC1 72-4797	51680	Universal Mounting Support Stand



Gas Anesthesia Mask shown with 51621 Rat Adaptor (not included)

- For rats in a stereotaxic instrument

Gas Anesthesia Mask Adapters

The Gas Anesthesia Mask

Adapters for Stereotaxic instruments, manufactured by Stoelting, enable gas anesthesia of rats in a Lab Standard™, or other brands of stereotaxic instruments, without exposing the researcher to the anesthetic gas.

The Gas Anesthesia Mask Adapter is installed by removing the nose clamp from the standard rat adaptor, sliding the mask over the incisor bar, with the cone opening toward the open "U". The animal's teeth are

placed over the incisor bar and the adapter is slid forward until the cone is snug about the animal's nose. The mask substitutes for the nose clamp. The teeth and the cone provide a very stable hold.

Gas flows in the tubing connector on one side, past the animal's nose, and out the tubing connector on the other side. From there, spent gas may be routed to recycling, exhaust, or gas analysis instruments.

Order #	Model	Product
EC1 72-4853	51610	Gas Anesthesia Mask Adapter, Rats

For Anesthesia Systems and Ventilators, see Section F.

Species Adaptors For Stereotaxic Instruments

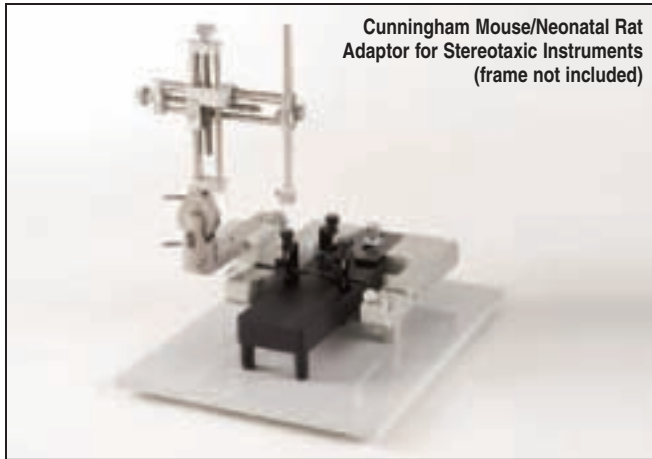
Traditional Frames



Previous



Next



Cunningham Mouse/Neonatal Rat Adaptor for Stereotaxic Instruments (frame not included)



Ear Bars

Cunningham™ Mouse and Neonatal Rat Adaptor

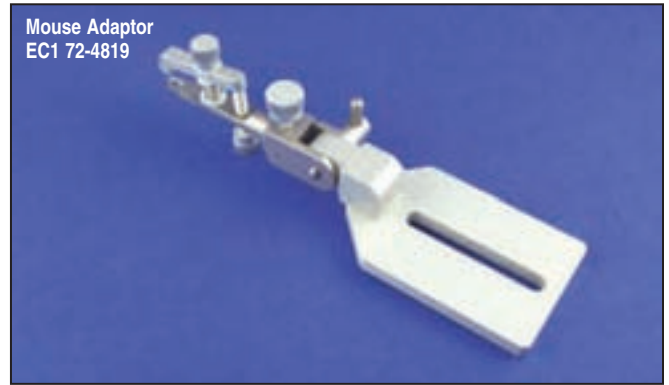
Model organisms with soft skulls, such as the mouse and the neonatal rat, have traditionally been difficult to secure firmly in a stereotaxic instrument. The stainless steel ear

bars used for adult rats are too heavy to position precisely enough to provide a secure hold while still avoiding flexing the sides of the skull inward (which compresses the airways and impedes blood flow.) Further, the neonatal rat pup has no external opening of the auditory canal into which to insert the ear bar points.

The Cunningham™ Mouse and Neonatal Rat Adaptor, manufactured by Stoelting, employs light, Delrin® ear bars with tapered points on one end, and rubber pads on the other, to facilitate surgery on such animals. Neonatal surgery may be accomplished with minimally invasive procedure by using the rubber pad ends of the ear bars. Ear bars may be independently adjusted in height, a unique feature to this stereotaxic instrument, to lever the skull. Laser engraved scales shows the vertical position of the ear bars. A tooth bar and nose clamp secures the nose. A well carved in the thick aluminum body may be filled with dry ice and alcohol for hypothermic anesthesia of neonatal animals. The Cunningham™ Mouse and Neonatal Rat Adaptor clamps securely to the "U" frame of the Lab Standard™, which provides the stereotaxic manipulator.

New improvements to this popular stereotaxic adaptor include an increased overall length to accommodate larger, more mature animals, and the addition of specialized jaw holder cuffs (51647), which securely clamp the zygomatic processes of the skull. The jaw holder cuffs fit over the ends of the ear bars, replacing the rubber pads, providing an alternative non-invasive means of securing the animal's head in the stereotaxic stage. These options for "triple point" securing of the animal's head in this adaptor make it the most versatile mouse stereotaxic available. Set of two jaw holder cuffs included.

Order #	Model	Product
EC1 72-4794	51625	Cunningham™ Mouse/Neonatal Rat Adaptor for 51600 Stereotaxic Frame
EC1 72-4795	51647	Jaw Holder Cuffs, set of 2



Mouse Adaptor EC1 72-4819

Mouse Adaptor

Ear bars can cause breathing difficulties and bleeding in mice. The 51624 Mouse Adaptor holds the mouse head by means of a palate bar and nose clamp, without ear bars. Head angle may be adjusted to achieve skull flat or other approach angles. Since there are no earbars, the same 51624 Mouse Adaptor fits 51600 and 51800 series stereotaxic instruments.

If you want to use earbars to perform stereotaxic surgery on the mouse, We offer the perfect miniature stereotaxic stage for mouse surgery: The Cunningham™ Mouse and Neonatal Rat Adaptor, pictured to the left.

Order #	Model	Product
EC1 72-4819	51624	Mouse Adaptor for 51600 and 51800 Stereotaxic Frames



Rat Adaptor

Rat Adaptor

The 51621 Rat Adaptor is included with the 51600 and 51603 Lab Standard Stereotaxic instruments. The 51821 Rat Adaptor is an optional extra for the 51800 and 51850 Large Animal Stereotaxic

Instruments. Both include the nose clamp assembly and ear bars.

Order #	Model	Product
EC1 72-4815	51621	Rat Adaptor with 18° Ear Bars for 51600 Stereotaxic Frame
EC1 72-4816	51620	Rat Adaptor with 45° Ear Bars (Non-Puncture) for 51600 Stereotaxic Frame
EC1 72-4817	51821	Rat Adaptor with 18° Ear Bars for 51800 Stereotaxic Frame
EC1 72-4818	51820	Rat Adaptor with 45° Ear Bars (Non-Puncture) for 51800 Stereotaxic Frame

See 37 for Mouse Anesthesia Platform.

Species Adaptors For Stereotaxic Instruments

Traditional Frames



Previous



Next

Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



Guinea Pig Adaptor

Guinea Pig Adaptor

The 51622/51822 Guinea Pig Adaptors include the 45° ear bars required for guinea pigs. Also, the nose clamp reaches further back behind the incisors than on the rat adaptors.

The Guinea Pig Adaptor is available for the 51600 and 51800 Lab Standard series of stereotaxic instruments.

Order #	Model	Product
EC1 72-4820	51622	Guinea Pig Adaptor with 45° Ear Bars for 51600 Stereotaxic Frame
EC1 72-4821	51822	Guinea Pig Adaptor with 45° Ear Bars for 51800 Stereotaxic Frame



Small Bird Adaptor

Small Bird Adaptor

The 51623/51823 Small Bird Adaptors include the 45° ear bars required for birds. The Small Bird Adaptor uses a beak support and "V" shaped beak clamp to hold the beak down and centered, in place of the incisor bar/nose clamp arrangement used for rats.

Order #	Model	Product
EC1 72-4827	51623	Small Bird Adaptor with 45° Ear Bars for 51600 Stereotaxic Frame
EC1 72-4828	51823	Small Bird Adaptor with 45° Ear Bars for 51800 Stereotaxic Frame



Cat/Monkey Adaptor

Cat/Monkey Adaptor

The Cat/Monkey Adaptor for the 51600 (optional) includes spacers and bolts to raise the "U" frame 2.5 in. above the base plate, as well as the eye socket/palate holder and 20 degree ear bars usually used for cats and monkeys.

The Cat/Monkey Adaptor is available with standard or non-puncture ear bars.

Order #	Model	Product
EC1 72-4822	51626	Cat/Monkey Adaptor with Standard Ear Bars for 51600 Stereotaxic Frame
EC1 72-4823	51627	Cat Adaptor with Non-Puncture Ear Bars for 51600 Stereotaxic Frame
EC1 72-4824	51826	Cat/Monkey Adaptor with Standard Ear Bars for 51800 Stereotaxic Frame
EC1 72-4825	51827	Cat Adaptor with Non-Puncture Ear Bars for 51800 Stereotaxic Frame



Cunningham Spinal Adaptor

- Models to Hold Mice or Rats for Stereotaxic Spinal Surgery

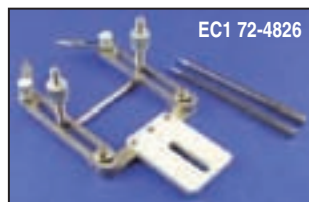
Cunningham™ Spinal Adaptor

The design of this instrument was inspired by the need for a practical, versatile, and economical instrument for reliably stabilizing the rodent spinal column. The Cunningham™ Spinal Adaptor is an accessory to be mounted on either the 51600 or the 51800 stereotaxic instrument or other brands of stereotaxic instruments, converting them for spinal surgery applications. It utilizes the manipulator and base plate of the stereotaxic instrument, thus enabling precision spinal preparations. The spinal column is secured by up to four independent transverse process clamps, as well as a spinous process clamp. The transverse process clamps are designed to minimize trauma while providing motionless support.

The instrument is engineered for one-handed control of gross and fine adjustment of the surgical preparation in the AP, ML, and DV planes.

Transverse process clamps are available to accommodate either the rat or the mouse. To work with both species, order the Spinal Adaptor for one species, and one set of transverse clamps for the other.

Order #	Model	Product
EC1 72-4811	51690	Cunningham™ Mouse Spinal Adaptor
EC1 72-4812	51695	Cunningham™ Rat Spinal Adaptor
EC1 72-4813	51691	Mouse Transverse Clamps, Set of Four
EC1 72-4814	51692	Rat Transverse Clamps, Set of Four



EC1 72-4826

Dog/Monkey Adaptor

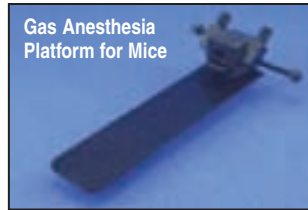
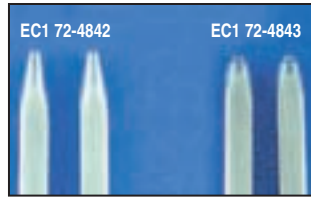
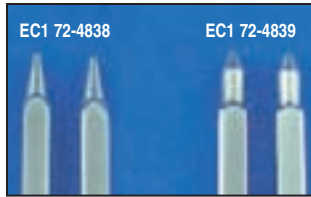
The 51852 Dog/Monkey Adaptor is available only for the 51800 series stereotaxic instruments. To fit any size dog, it should be used

with 51850/51851 instruments. The 51850/51851 Dog Stereotaxic Frames have two sets of ear bar holders at different spacings from the front to accommodate the wide size range of dogs.

Order #	Model	Product
EC1 72-4826	51852	Dog/Monkey Adaptor with Ear Bars for 51800 Stereotaxic Frame

Accessories for Stereotaxic Instruments

Traditional Frames



- Holds mice during anesthesia and surgery
- Precise and secure positioning

Gas Anesthesia Platform for Mice

- For mice or rats in a stereotaxic instrument

Lab Standard™ Ear Bars

Lab Standard Ear Bars have laser engraved scales. The ear bars are 6.2 mm square. Ear bars for the 51600 series of stereotaxic instruments have a different zero point than do those for the 51800 series.

Standard ear bars (included with the instrument) have an 18° taper at the tip to penetrate far into the ear canal for a more secure hold. They puncture the tympanic membrane. Non-puncture ear bars have a 45° taper, and do not puncture the tympanic membrane, but offer a slightly less stable hold.

Order #	Model	Product
EC1 72-4838	51611	Ear Bars, Rat, 18° for 51600 Stereotaxic Frame
EC1 72-4839	51612	Ear Bars, Rat, 45° Non-Puncture for 51600 Stereotaxic Frame
EC1 72-4840	51811	Ear Bars, Rat, 18° for 51800 Stereotaxic Frame
EC1 72-4841	51812	Ear Bars, Rat, 45° Non-Puncture for 51800 Stereotaxic Frame
EC1 72-4842	51613	Ear Bars, Cat, 18° for 51600 Stereotaxic Frame
EC1 72-4843	51614	Ear Bars, Cat, 45° Non-Puncture for 51600 Stereotaxic Frame
EC1 72-4844	51813	Ear Bars, Cat, 18° for 51800 Stereotaxic Frame
EC1 72-4845	51814	Ear Bars, Cat, 45° Non-Puncture for 51800 Stereotaxic Frame

This Gas Anesthesia Platform for Mice allows for precise and secure positioning of an animal during anesthesia and surgery when used with the 51625 Mouse and Neonatal Rat Adaptor. After removing the animal from the induction chamber, it can be quickly mounted on the platform. The animal's teeth are placed over the incisor bar and the mouse mask slides forward until the cone is snug about the animal's nose, thereby substituting for the nose clamp. The platform is then lifted onto the Cunningham™ Mouse Adaptor, providing positioning of the animal that is perfect, automatic and effortless. The gas anesthesia platform and mask is also useful for non-stereotaxic related experimental applications. With the platform placed on your bench top, simply fix the head of the mouse or rat in the mask, attach appropriate tubing (1/4 inch I.D.) to the gas mask, and you're ready to perform surgery, injections, or implantations under gas anesthesia.

Order #	Model	Product
EC1 72-6043	50266	Gas Anesthesia Platform for Mice
EC1 72-6044	50264	Gas Anesthesia Platform plus Mouse Gas Mask Adaptor
EC1 72-6045	50267	Gas Anesthesia Platform plus Rat Gas Mask Adaptor

Ear Bars for Auditory Testing

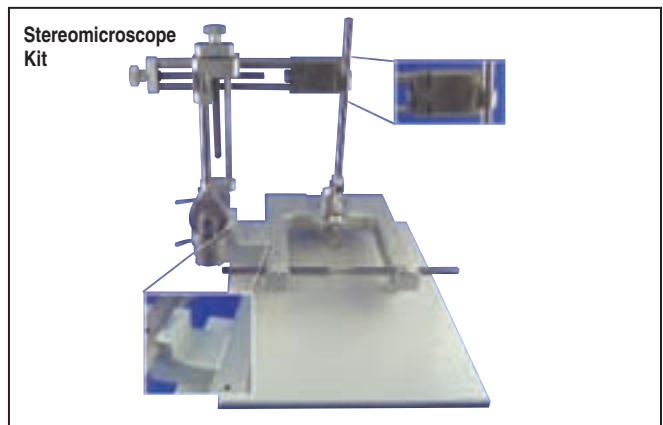
Order #	Product
EC1 72-6861	Hollow Ear Bars for Auditory Testing, 45° for Model 51600



Centering Stand

The Centering Stand allows centering of probes to ear bar zero away from the animal before placing them on the 51801 or 51851 frames. It also serves as a storage fixture for manipulator arms.

Order #	Model	Product
EC1 72-4847	51878	Centering Stand



Stereomicroscope Kit

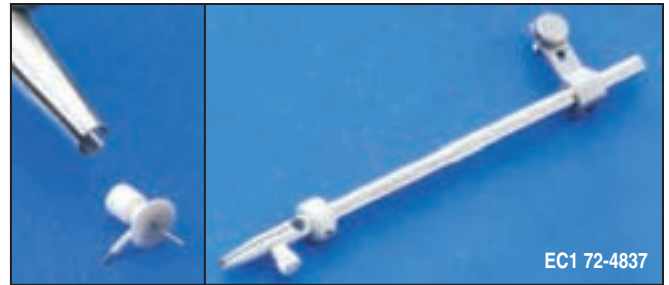
The kit enables a stereomicroscope to be positioned above the animal without contacting the manipulator arm. Spacer blocks at top and bottom move the manipulator two inches lateral for clearance.

Order #	Model	Product
EC1 72-4848	51608	Stereomicroscope Kit

stereotaxic frames

Holders

Traditional Frames



Standard Probe Holder

Standard Probe Holders come complete with mounting "V" blocks. The 11 mm square acrylic block on the bottom has grooves spaced 1mm apart. Three bottom clamp options are available. The corner clamp holds shafts from 0.2 to 2.0 mm. The side clamp holds probes from 0.2 to 4.5 mm, as does the "C" clamp, which is useful to release implanted probes. The 51631 Standard Probe Holder with Corner Clamp is included with each manipulator on complete instruments.

Order #	Model	Product
EC1 72-4829	51631	Holder with Corner Clamp
EC1 72-4830	51632	Holder with Side Clamp
EC1 72-4831	51634	Holder with "C" Clamp



- Holds Glass Syringe

Large Probe Holder

Large Probe Holders support shafts with diameters from 6.5 mm. up to 13 mm. (0.5 in). This will hold Hamilton™ Microsyringes, either Stereotaxic Drill from Stoelting, and any accessories designed for the Stellar Stereotaxic Instrument.

A threaded drive pulls the sliding "U" holder against the outside of the probe, pulling the probe into a "V" notch for straight and reproducible positioning.

Order #	Model	Product
EC1 72-4832	51633	Large Probe Holder

Cannula Holder

Holds standard 3.4 mm diameter cannula heads, as manufactured by Plastics One™, for cannula sets, and Alza® for minipumps. Tapered non-intrusive for easily cementing cannulae in place.

Order #	Model	Product
EC1 72-4837	51636	Cannula Holder



Microdialysis Holder

The Microdialysis Probe Holder is to fit a specific size of probe. The hole in the stainless steel foot may be drilled to fit probes from 1.5 to 6.0 mm. Our standard sizes are 1.5 and 2.0 mm holes. Other sizes are available by special order.

Order #	Model	Product
EC1 72-4835	51637	Microdialysis Holder with 1.5 mm Hole
EC1 72-4836	51637-2.0	Microdialysis Holder with 2.0 mm Hole



Probe Centering Device

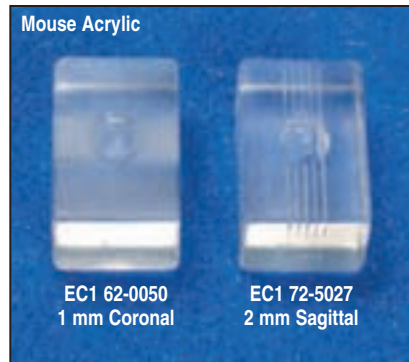
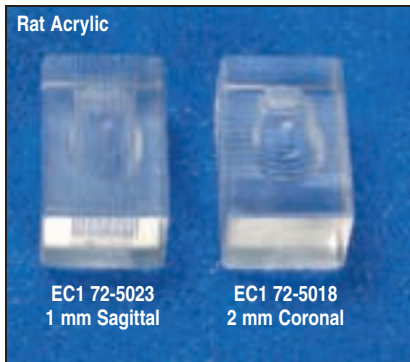
This accessory mounts on the "U" frame of the 51600, and allows replacing and centering the probe (only for use with ear bar 0 coordinates), without removing the animal. Hole is 2.7 mm above 0.

Order #	Model	Product
EC1 72-4846	51607	Probe Centering Device Removable Zero Point

See page 42 for the EC1 72-4860 Extra Large Probe Holder.

Rodent Brain Matrices

For Tissue Sampling



- Repeatably slices from 0.50 to 3.00 mm
- Coronal or sagittal sectioning
- Available in acrylic or stainless steel - (other materials upon request)
- Custom sizes and shapes
- Mouse, rat, gerbil, hamster, guinea pig and rabbit

These Rodent Brain Matrices aid in the dissection of discrete regions of a rodent brain or comparably sized organ. They allow the investigator to slice repeatable coronal or sagittal sections of the sample, enabling precise blocking prior to microtome sectioning and the removal of small, reproducible brain regions (i.e. discrete terminal fields or nuclei) for biochemical analysis, such as the determination of neurotransmitter and metabolite concentrations. Individual brain areas may be stained, dissected or micropunched (using micron biopsy punches) from the slices formed.

All matrices are designed for long-term use, and matrices of any given type are identical to insure reproducible sections. Channels are cut at precise intervals ranging from 0.50 mm to 3.00 mm and are 0.3 mm wide. Other species, sizes, and materials are available upon request.

Brain Matrices

Coronal			Sagittal		
Order #	Animal	Slice Width, mm	Order #	Animal	Slice Width, mm
Stainless Steel Brain Matrices					
EC1 72-6225	Neonatal Rat	0.5	EC1 72-6229	Neonatal Rat	0.5
EC1 72-6226	Neonatal Rat	1.0	EC1 72-6230	Neonatal Rat	1.0
EC1 72-6227	Neonatal Rat	2.0	EC1 72-6231	Neonatal Rat	2.0
EC1 72-6228	Neonatal Rat	3.0	EC1 72-6232	Neonatal Rat	3.0
EC1 72-6235	Mouse	0.5	EC1 72-6236	Mouse	0.5
EC1 72-5032	Mouse	1.0	EC1 72-5038	Mouse	1.0
EC1 72-5033	Mouse	2.0	EC1 72-5039	Mouse	2.0
EC1 72-5034	Mouse	3.0	EC1 72-5040	Mouse	3.0
EC1 72-6233	Rat 200-300 gr	0.5	EC1 72-6234	Rat 200-300 gr	0.5
EC1 72-5029	Rat 200-300 gr	1.0	EC1 72-5035	Rat 200-300 gr	1.0
EC1 72-5030	Rat 200-300 gr	2.0	EC1 72-5036	Rat 200-300 gr	2.0
EC1 72-5031	Rat 200-300 gr	3.0	EC1 72-5037	Rat 200-300 gr	3.0
EC1 72-6237	Rabbit	1.0	EC1 72-6240	Rabbit	1.0
EC1 72-6238	Rabbit	2.0	EC1 72-6241	Rabbit	2.0
EC1 72-6239	Rabbit	3.0	EC1 72-6242	Rabbit	3.0
Acrylic Brain Matrices					
EC1 72-6216	Neonatal Rat	1.0	EC1 72-5026	Mouse	1.0
EC1 72-6217	Neonatal Rat	2.0	EC1 72-5027	Mouse	2.0
EC1 72-6218	Neonatal Rat	3.0	EC1 72-5028	Mouse	3.0
EC1 62-0050	Mouse	1.0	EC1 72-5023	Rat 200-300 gr	1.0
EC1 62-0051	Mouse	2.0	EC1 72-5024	Rat 200-300 gr	2.0
EC1 72-5022	Mouse	3.0	EC1 72-5025	Rat 200-300 gr	3.0
EC1 62-0047	Rat 200-300 gr	1.0	EC1 72-6222	Gerbil	1.0
EC1 62-0048	Rat 200-300 gr	2.0	EC1 72-6223	Gerbil	2.0
EC1 62-0049	Rat 200-300 gr	3.0	EC1 72-6224	Gerbil	3.0
EC1 72-6219	Gerbil	1.0	-	-	-
EC1 72-6220	Gerbil	2.0	-	-	-
EC1 72-6221	Gerbil	3.0	-	-	-

For Tissue Sampling



Previous



Next



- Repeatable slices from 0.50 to 3.00 mm
- Mouse and rat
- Custom sizes and shapes available upon request

Rodent Heart, Spinal Cord and Tumor Matrices

These Rodent Heart and Spinal Cord Matrices aid in the dissection of discrete regions of a rodent heart or spinal cord, or comparably sized organ. They allow the investigator to slice repeatable sections of the sample, enabling precise blocking prior to microtome sectioning and the

removal of small, reproducible brain regions (i.e. discrete terminal fields or nuclei) for biochemical analysis.

All matrices are designed for long-term use, and matrices of any given type are identical to insure reproducible sections. Channels are cut at precise intervals ranging from 0.50 to 3.00 mm and are 0.3 mm wide. Other species, sizes and materials are available upon request.

Acrylic Heart Matrices

Order #	Animal	Slice Width
EC1 72-6210	Mouse	1.0
EC1 72-6211	Mouse	2.0
EC1 72-6212	Mouse	3.0
EC1 72-5014	Rat	1.0
EC1 72-5015	Rat	2.0
EC1 72-5016	Rat	3.0

Acrylic Spinal Cord Matrices

Order #	Animal	Slice Width
EC1 72-6213	Rat	1.0
EC1 72-6214	Rat	2.0
EC1 72-6215	Rat	3.0



- Stainless steel tips
- Circular sectioning diameters from 0.300 mm
- Expulsion tube and syringe provided
- Can be used with sections from brain slicers and tissue matrices

Micron Biopsy Punches

These Micron Punches are ideal for dissection or removal ("punch") of discrete brain regions. Enabling the removal of specific brain nuclei, tracts

and other subdivisions, Micron Biopsy Punch applications include dissection for analysis of neurotransmitter concentrations of mRNA levels, preparation of regions prior to acute dissociation for patch recording, and tissue preparation for pharmacological analysis of neurotransmitters and metabolite changes in response to different pharmacological agents.

The Micron Punch has a stainless steel tip, brass handle, and punch diameters ranging from 0.30 mm to 2.0 mm.

Order #	Product
EC1 72-5041	2000 Micron Punch, 2.0 mm
EC1 62-0052	1000 Micron Punch, 1.0 mm
EC1 62-0053	750 Micron Punch, 0.75 mm
EC1 62-0054	500 Micron Punch, 0.50 mm
EC1 62-0055	300 Micron Punch, 0.30 mm



- Rechargeable
- Light-weight design
- No special tools needed to charge burrs
- Excellent balance and handling
- Appropriate for Mice

Ideal Micro-Drill™

The Ideal Micro-Drill™ is designed for research applications that require surgical burrs and trephines. The drill is constructed of light-weight aluminum alloy for balance and control and is powered by a rechargeable

6-volt nickel cadmium battery (charger included). Under normal operating conditions the unit will function for 8 hours between recharging.

**Appropriate for mice skull and other thin bone.*

Specifications

Length	17.5 cm (without burr)
Diameter	1.9 cm
Power	6 V DC
Speed	12,000 rpm
Stall Torque	1.25 oz/in

Order #	Product
EC1 72-6065	Ideal Micro-Drill™ Complete Kit
EC1 72-6066	Ideal Burr Set of 5 each

Bone Micro Drill System

For Brain Surgery



- Dental quality construction for delicate work
- Flexible telephone-style cord eliminates bothersome drive cables
- Quick change chuck for easy bit replacement
- Versatile forward, reverse, and variable speeds
- Small, lightweight, ergonomically designed hand piece reduces fatigue
- Complete - includes ball mills, abrasive bits, and cutting discs

This Micro Drill is a workhorse in a kit. This versatile powerhouse is ideal for milling, drilling, grinding and cutting. This drill quickly cuts through bone and other materials. It may also be used for general purpose work such as removing coatings, cutting, drilling holes, cutting slots, as well as performing many other procedures using various interchangeable bits. Unlike most hand-held tools, the Micro Drill has a tiny, high speed DC motor in the hand piece, eliminating bothersome drive cables and giving the researcher better control. A separate power supply keeps the hand piece lightweight and reduces fatigue. Power is supplied by a panel switch or foot switch for ease of use.

The Ball Mills are dental grade carbide steel for precision cutting and long life. All sizes have a 0.093 in diameter shank. The complete Micro Drill System is supplied with a variety of Ball Mills, but you may also purchase them separately.

This Micro Drill System is supplied complete with handpiece, cord, power supply, hand piece stand and EC1 72-4967 Accessory Kit. The contents of the Accessory Kit are listed in the chart to the right. Additional Ball Mills and accessories are also available separately in the quantities noted in the ordering information.

With the addition of EC1 72-4832 Extra Large Probe Holder, you can attach the Micro Drill to a Stereotaxic Instrument.

EC1 72-4967 Accessory Kit Includes

Product	Qty.
Abrading Tip, Rubber	4
Abrading Tip, Stone	1
Accessory Stand	1
Ball Mill, Carbide, #1, .031 in Diameter	1
Ball Mill, Carbide, #2, .039 in Diameter	1
Ball Mill, Carbide, #3, .047 in Diameter	1
Ball Mill, Carbide, #4, .055 in Diameter	1
Ball Mill, Carbide, #5, .063 in Diameter	1
Ball Mill, Carbide, #6, .071 in Diameter	1
Ball Mill, Carbide, #7, .083 in Diameter	1
Ball Mill, Carbide, #1/4, .019 in Diameter	1
Ball Mill, Carbide, #1/2, .027 in Diameter	1
Cutoff Disk	4
Mandrel, Screw	1
Mandrel, Threaded	1

Order # Product

EC1 72-4950	Complete Bone Micro Drill System, 120 VAC
EC1 72-4951	Complete Bone Micro Drill System, 230 VAC
EC1 72-4967	Accessory Kit for Micro Drill
EC1 72-4952	Abrading Tip, Rubber, pkg. of 20
EC1 72-4953	Abrading Tip, Stone, pkg. of 5
EC1 72-4954	Accessory Stand
EC1 72-4955	Ball Mill, Carbide, #1, .031 in Diameter, pkg. of 5
EC1 72-4956	Ball Mill, Carbide, #2, .039 in Diameter, pkg. of 5
EC1 72-4957	Ball Mill, Carbide, #3, .047 in Diameter, pkg. of 5
EC1 72-4958	Ball Mill, Carbide, #4, .055 in Diameter, pkg. of 5
EC1 72-4959	Ball Mill, Carbide, #5, .063 in Diameter, pkg. of 5
EC1 72-4960	Ball Mill, Carbide, #6, .071 in Diameter, pkg. of 5
EC1 72-4961	Ball Mill, Carbide, #7, .083 in Diameter, pkg. of 5
EC1 72-4962	Ball Mill, Carbide, #1/4, .019 in Diameter, pkg. of 5
EC1 72-4963	Ball Mill, Carbide, #1/2, .027 in Diameter, pkg. of 5
EC1 72-4964	Cutoff Disk, pkg. of 20
EC1 72-4965	Mandrel, Screw, pkg. of 5
EC1 72-4966	Mandrel, Threaded, pkg. of 5

Extra Large Probe Holder and Artificial CSF



Previous



Next

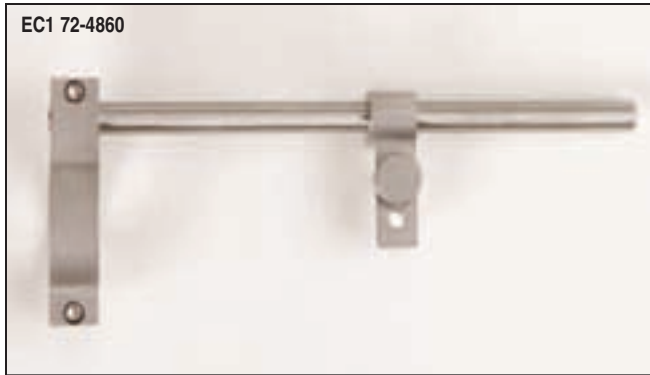
Section Table of Contents

Main Table of Contents

Search

WWW Home

Contact Us



- Holds Micro Drill Hand Piece

Extra Large Probe Holder

Extra Large Probe Holders support shafts with diameters from 13mm up to 26 mm. This will hold the hand piece of the 72-4950 and 72-4951 Bone Micro Drill, allowing you to attach the Micro Drill to a Stereotaxic Instrument.

Order #	Product
---------	---------

EC1 72-4860	51630	Extra Large Probe Holder
-------------	-------	--------------------------



Application Note: Perfusion Fluid

The perfusion fluid should be identical in composition to the interstitial fluid being sampled except that it is devoid of the substances of interest (or has excess concentration of the substance to be delivered). Perfusion fluids vary widely in terms of their composition and pH. Generally, they are prepared as iso-osmotic as possible.

Order #	Product
---------	---------

EC1 59-7316	Artificial CSF Perfusion Fluid
-------------	--------------------------------

Artificial CSF Perfusion Fluid

Artificial cerebrospinal fluid (aCSF) is commonly used when sampling from brain interstitial fluid. This solution closely matches the electrolyte concentrations of CSF. It is prepared from high purity water and analytical grade reagents. It is microfiltered and sterile. Final Ion Concentrations (in mM): Na 150; K 3.0; Ca 1.4; Mg 0.8; P 1.0; Cl 155. Supplied as a package of six 25 ml vials.

stereotaxic FAQ's



Previous



Next



Section Table of Contents



Main Table of Contents



Search



WWW Home



Contact Us

General Stereotaxic FAQ's

How can I tell if the earbars are positioned correctly?

Next to the ear sockets, there are skull recessions that can feel like the ear holes, but are not as stable. On the rat, grasp the end of the snout and attempt to rock it gently from side to side. If it moves at all, the ear bars are not correctly installed. Swivel the snout up, and let go, or down and let go. If it stays where you leave it and doesn't move up or down, the ear bars are installed correctly.

How do I move the probe out of the way in order to drill the skull hole?

Always swivel from just above the universal joint tilting mechanism. At this point, flat tapered faces will allow you to swivel out and come back to exactly the same point. Or, do it the slow way and turn the knob until the probe is out of the way. Never use the swivel below the universal joint for this purpose. Without the alignment faces, with only graduation lines to guide you, you will not be able to align the lines perfectly enough. The distance from the center of rotation to the graduation marks is several multiples shorter than the distance from the center of rotation to the electrode tip. This multiple will apply to any errors of alignment of the graduation marks, and leave the electrode tip a biologically significant distance from the initial alignment.

Single or Dual Manipulator: which is right for you?

To implant bilateral cannulas, one needs only a single manipulator, since this task is done sequentially anyway. To stimulate on the contralateral side, while recording on the ipsilateral side, requires two probes under independent and simultaneous stereotaxic control. This task requires a dual stereotaxic instrument.

Digital Stereotaxic FAQ's

Do the Digital Scales cause me to lose any range of motion on the manipulators?

One of the main design criteria for the digital stereotaxic instrument was for low profile unobtrusive scales. This goal was accomplished in the final product. The instrument has the full range of motion required for practically all procedures. The total range of angle movement is 0 to 75 degrees.

How stable is the manipulator? Will I lose any of my readings?

The manipulator is one of the most stable manipulators on the market today. The addition of the scales does nothing to reduce the stability you would have with a non-digital manipulator. The digital display will not change readings unless the manipulator advance knobs are moved. You also always have access to the standard vernier scales to verify your readings or utilize as a backup.

Why does your display read to 0.005 mm? The brain atlases only read to 0.1 mm, and bregma is not that precise. What good are the last two decimals?

The atlases now read to 0.1 mm because that is the best that can be measured with today's stereotaxic instruments. Better atlases will follow better instruments. In the expanded scale of the printed atlases, it is reasonable to interpolate to 0.01 mm. The bregma argument is more interesting. Measuring from bregma to reach a point in brain, the start point has more error of determination than our instrument (we are working on a solution to the accuracy of the start point). The last two decimals probably do not do much to improve stereotaxic accuracy of initial placement. However, sometimes accuracy of distance moved within the brain is what is important, as when initial placement is determined by recording from brain, and then advancing a set distance, or as in knife cuts. In this case, all the resolution of this instrument is useful.

How accurately does it measure? How often does it need to be recalibrated?

Measurements are not absolute, but relative to a selected zero point. From selected zero, distance along a linear scale is counted. This is not an analog or rotary scale, what is measured is actual distance moved. No calibration is necessary or possible. The instrument is accurate to 5 microns, and remains that accurate.

The display box takes up space on my crowded counter. Couldn't it be smaller?

Many customers anxious to switch from verniers are having trouble reading them because of the tiny size and detail lines. We deliberately chose large, easily read, (even from a distance) 12 mm digit displays, and put large lettering on the silk screening identifying the scales. No mistakes due to imperfect vision. The large digits will be appreciated with use and time.