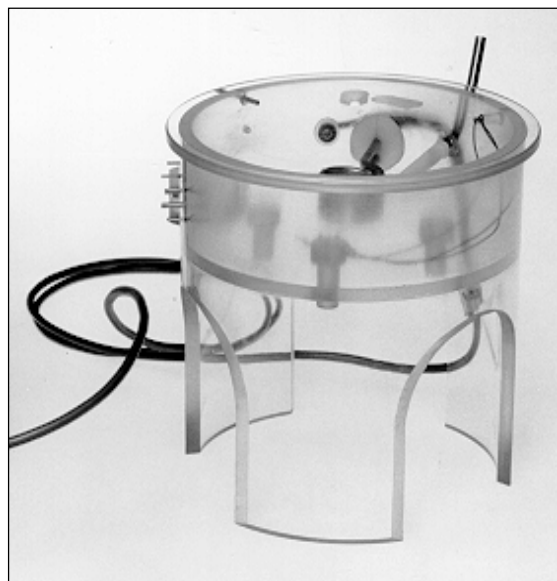


Tissue Slice Recording Equipment

- **THREE TYPES OF RECORDING CHAMBERS FOR BATCHWISE OR CONTINUOUS EXCHANGE OF FLUIDS, INTRACELLULAR OR EXTRACELLULAR RECORDING**
- **RECORDING TANK INCLUDES PROVISION FOR CONTROLLED BATH TEMPERATURE AND MOIST, OXYGENATED ATMOSPHERE**

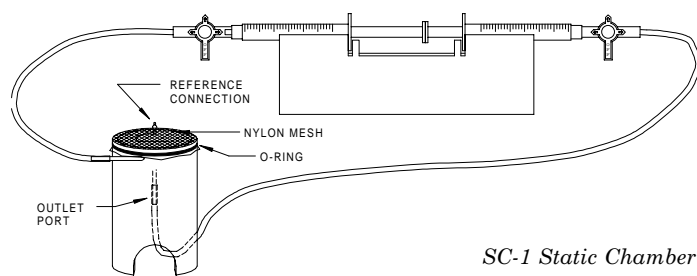


The technique of microelectrode recording from brain slice has become increasingly popular because it permits the precise placement of electrodes and minimizes anesthetic and brain movement effects while investigating the interaction of biochemical and neuropharmacological agents. FHC now offers a complete system for preparing, stabilizing and recording from brain slices.

Brain slices are prepared using the TC-1 Tissue Chopper or OTS-4000 Oscillating Tissue Slicer. The Chopper uses inexpensive double-edged razor blades and features a stage position digital readout (10 micron increments), a replaceable Delrin stage plate, and adjustable blade height control.

Our Oscillating Tissue Slicer can also be used to cut unfixed tissue for brain slice recording. Please refer to page 39 for detailed operational information on the OTS-4000.

Slices can be placed on one of three types of Recording Chambers. Recording chambers are mounted in the RT-4 Tank for equilibration and recording.

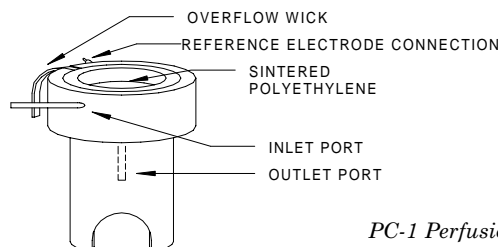


SC-1 Static Chamber

The SC-1 Static Chamber is 25mm in diameter, has a volume of 2ml and is stable enough to be used for single unit extracellular record-

ing. The slice is suspended on a nylon mesh held taught by an O-ring. Its large surface area makes it convenient for mounting several slices.

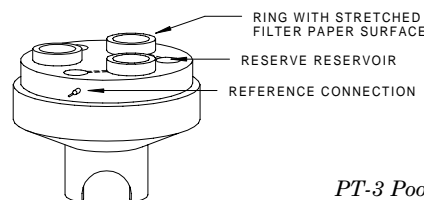
The SC-1 includes a built-in Ag/AgCl reference electrode and provision for periodic fluid exchange via Cat. 80-10-3 Push/Pull Syringe Fixture. The push/pull feature permits identical amounts of fluid to be added and withdrawn simultaneously. A 3-way stopcock used with a third syringe enables different solutions to be introduced.



PC-1 Perfusion Chamber

The PC-1 Perfusion Chamber is suitable for intracellular or extracellular recording and is available in two sizes; 10mm diameter (0.3ml volume) or 20mm diameter (0.6ml volume) and is designed for rapid exchange of solutions; tissue slices can be perfused with solution introduced through the sintered polyethylene side walls of the chamber (the slice can be immersed or only floated in solution). An integral Ag/AgCl reference electrode is included. The inlet port accepts 17 ga TW Teflon tubing (2.5m provided). The fluid flows down through the sintered polyethylene Chamber floor, and out the exit port which accepts PE 280 tubing (50cm provided).

Regulation of the flow rate (approximately 3ml/min) can be accomplished with a gravity or pressure system. The pressure created by the outflow holds the slice securely enough for intracellular recording. The sintered polyethylene will also support fine pins if other preparations (e.g. isolated ganglia) are to be perfused.



PT-3 Pool-Type Chamber

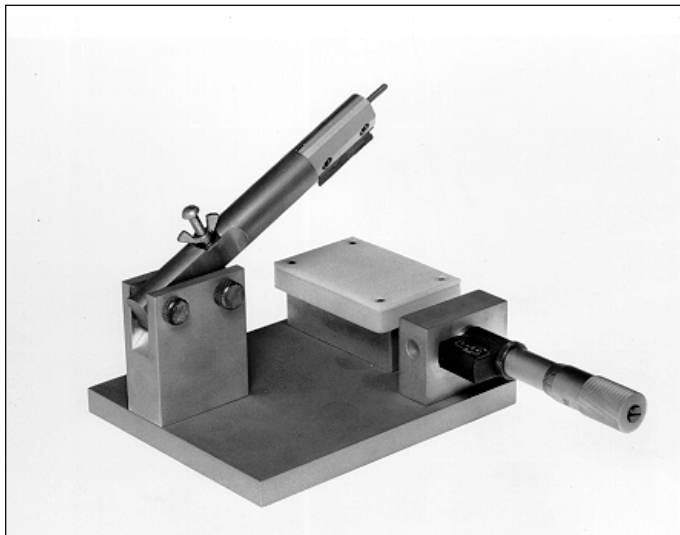
The PT-3 Pool-Type Chamber includes three small (1.2mm dia) static pools on a Lexan support disk. Each pool is fitted with a plastic ring over which a piece of filter paper is stretched and secured to serve as support for the slices. Each pool has a reserve fluid reservoir and a built-in Ag/AgCl reference electrode. There is no provision for fluid exchange (however, tissue has been reported viable for approximately 8 hours). The volume of each is approximately 2ml.

The RT-4 Recording Tank consists of a clear Tank (6" in height, 6: in diameter) and Lid with access holes for introduction electrodes. The Tank also includes:

- three pegs to mount PC-1, SC-1, or PT-3 Chambers
- inlet port and bubbler diffusion cartridge for 95%O₂/5% CO₂
- six inlet and outlet feedthrough ports for solution flow through PC-1 and SC-1 recording chambers
- built-in stainless steel heating rod and 5000 Ohm thermistor probe to maintain a constant bath temperature

Oxygenation of slices is accomplished by connecting a tank of 9%CO₂ gas to an inlet port in the wall of the Recording Tank. The gas is then bubbled through a replaceable bubbler.

FHC Catalog #40-90-8 Temperature Control module with Digital Display can be used to control the temperature of the bath in the Tank. Please refer to Pages 28 and 29 for more about this low noise proportional controller.

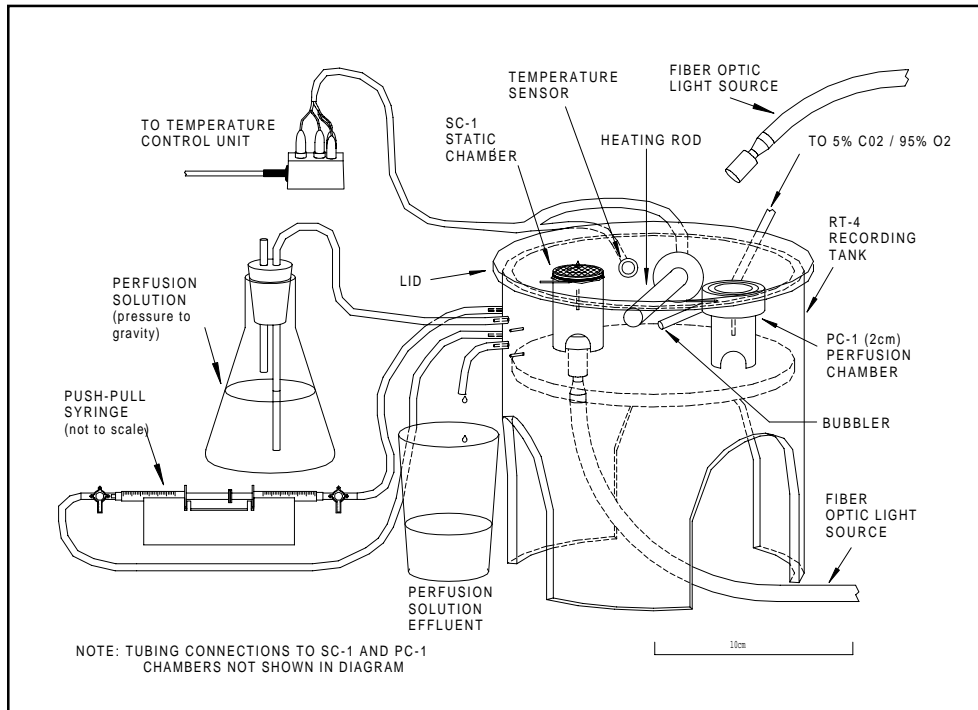


ORDERING INFORMATION

- 80-10-1 PT-4 Recording Tank
- 80-10-2 SC-1 Static Recording Chamber
- 80-10-3 Push/Pull Syringe System
- 80-10-4 PC-1 Perfusion Chamber, 1 cm dia.
- 80-10-6 TC-1 Tissue Chopper
- 80-10-6-02 Tissue Chopper with Electronic Display
- 80-10-7 FO-2 Fiber Optic Light Source
- 80-11-3 Sintered Filter Cartridge
- 80-11-4 PC-1 Perfusion Chamber, 2 cm dia.
- 80-11-7 PT-3 Pool-type Chamber

ACCESSORY EQUIPMENT

- 40-90-8 DC Temperature Control Module/Digital Display



OPERATIONAL DESCRIPTION

A typical recording set-up is shown above. Investigators who require a rapid change of solution or the stability of the PC-1 Perfusion Chamber often use an SC-1 Chamber for storage and equilibration of the slices in the tank environment prior to recording.

To set up for operation, the necessary recording chambers are positioned in the Tank (an SC-1 and a PC-1 are shown) and the inlet and exit tubes are connected through the ports on the side; Inlet tubing should be wound around the tank several times so the fluid is warmed to tank temperature.

The Tank is then filled with distilled water and the Temperature Control Module is used to bring the tank to the required temperature (usually 32-37 C). 95%O₂ / 5%CO₂ (approximately 0.5 l/min) is connected to the bubbler input and the Tank lid is positioned.

While the tank comes to temperature, the SC-1 Chamber is filled and reconnected to the Push/Pull Syringe Fixture. The brain is then excised and sliced using either the TC-1 Tissue Chopper or the OTS-3000/4000 - Oscillating Tissue Slicer. It should be kept immersed in chilled media at all times to increase slice viability and tissue consistency.

As the brain is cut, the slices are removed from the blade with a fine (000) sable brush and placed on the recording chamber's surface. When cutting is complete, the slices are allowed to equilibrate in the Tank for one hour.

To record, the Tank lid access hole is positioned over the Chamber. One pipe from the fiber optic light source is plugged into the peg below the Tank and the other is directed over the Chamber from above. Recording and stimulating electrodes are positioned in the slice when the experiment is ready to commence.