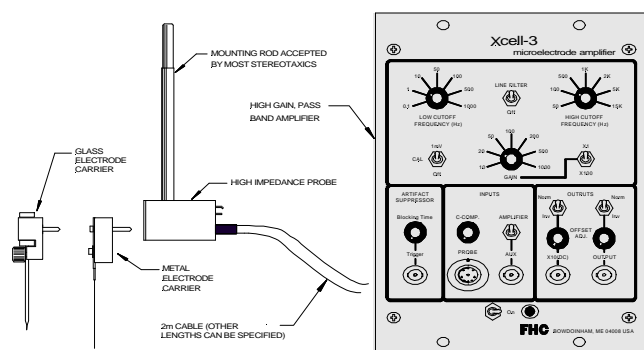


Xcell-3 Microelectrode Amplifier



- DC AND AC OUTPUTS
- PROBE DESIGN PUTS FIRST STAGE OF AMPLIFICATION AT MICROELECTRODE INTERFACE
- INPUT DISCONNECT FOR HIGH CURRENT INJECTION
- CONVENIENT GLASS AND METAL MICROELECTRODE CARRIERS INCLUDED
- WIDE GAIN RANGE (10 - 100,000)
- SHARP (-12dB/OCTAVE) HIGH AND LOW CUTOFF FILTERS
- LINE FILTERS (50 OR 60Hz) PROVIDED
- COMPACT SIZE WITH BUILT IN POWER SUPPLY
- ARTIFACT SUPPRESSOR CIRCUIT

The 40-40-7B **Microelectrode Amplifier** represents a new standard of low noise, high impedance amplification versatility for both intracellular and extracellular applications. State-of-the-art integrated circuits have enabled us to lower noise while increasing band width, while, at the same time adding features that make microelectrode recording more convenient. By connecting a high impedance, low noise, differential preamplifier directly to the electrode carrier, external noise pickup is minimized.

Built-in low and high cut-off filters allow the investigator to reject signals outside the spectrum of interest. Additionally, a sharp notch filter can be introduced to virtually eliminate interference from power lines. The voltage gain of the system is adjustable from 10 to 100,000 in thirteen calibrated steps.

An internal 1 millivolt calibrator is available to ensure gain accuracy. Several features provide for an exceptional degree of "remote-control" away from the recording electrode preparation. Provided on the front panel of the amplifier are:

- Capacitance neutralization control
- A built-in Artifact Suppressor circuit uses a gated unity gain amplifier. Once initiated, the gating period is fixed by the Blocking Time setting. Additional trigger pulses occurring during the gating period will not affect the Blocking Time.
- A switch which electrically disconnects the microelectrode from the preamplifier input and connects it instead to a BNC connector (AUX), permitting the investigator to apply stimulation or lesion currents.
- Offset and polarity switches are provided for both the DC (fixed gain = 10) and AC (variable gain and bandwidth) outputs.

The Xcell-3 is packaged in a modular cabinet which occupies only 5 1/2" x 7" when mounted in a standard rack or it can stand alone on the bench top. The probe is connected to the module by a 2 meter cable (other lengths can be specified).

The system includes a built-in, line powered 115-230V, 50-60Hz supply.

SPECIFICATIONS

- Input:** Differential
- Input Impedance:** 10^{12} Ohms
- Input Bias Current:** 4pA
- Common Mode Rejection:** 95dB at 60Hz
- Gain (DC Output):** x10
- Gain (AC Output):** x10 x 100,000 in 13 calibrated steps
- Frequency Response (DC output):** DC - 35KHz
- Frequency Response (AC output):** .1Hz - 15KHz (-3dB)
- Filter Cutoff Slopes:** -12dB/Octave
- High Cutoff Ranges (Hz)(-3dB):** 50, 100, 500, 1K, 2K, 10K, 15K
- Low Cutoff Ranges (Hz) (-3dB):** .1, 1, 10, 50, 100, 1000
- Input Dynamic Range:** $\pm 1V$
- Output Dynamic Range:** $\pm 10V$
- x10 (DC) Offset:** Adjustable through $\pm 6V$
- Output Offset:** Adjustable through $\pm 2V$
- Cal Signal:** 1000Hz square wave provided equivalent to 1mV at probe input
- Capacitance Compensation:** 10 to 100pF
- Line Filter:** 50 or 60Hz (specify) -40dB attenuation
- Aux. Input:** Maximum - 1A 30VDC, 0.3A 110VDC, 0.25A 125 VAC(RMS)
- Blocking Time:** 0.15mS - 6mS
- Trigger Input:** Zero to 1V(min) positive edge transition with a pulse width of 50 μ S(min). Trigger pulse amplitude limits are -1V and +5V.
- Dimensions:** 5 1/2" x 7" x 9" (18 x 14 x 23 cm) 4.5 lbs. (2kg)
- Power Requirements:** 115/230VAC, 50-60Hz, Switch Selectable

ORDERING INFORMATION

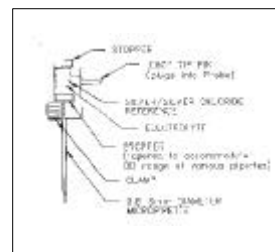
40-40-7B Xcell-3 Microelectrode Amplifier

Including: 74-77-2 Glass Microelectrode Carrier & 74-77-3 Metal Microelectrode Carrier

GLASS MICROELECTRODE CARRIER

Micropipettes are inserted through a soft rubber stopper into an electrolyte-filled chamber containing a silver/silver chloride electrode mechanically isolated to prevent damage.

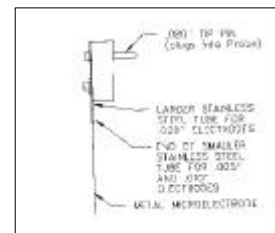
The stopper accepts tubing from .8 to 2mm; no adjustments are necessary. A second stopper in the top of the Carrier allows a small amount of air into the system so that replacing microelectrodes does not create bubbles necessitating a refill of the chamber. The top stopper can be replaced with a fitting for pressure injection if necessary.



METAL MICROELECTRODE CARRIER

A metal microelectrode is inserted into a stainless steel tube connected electrically to the tip pin. Two telescoping tubes are provided. The smaller tube accepts .005" (.125mm) and .010" (.250mm) diameter shanks, the larger tube is for .020" (.500mm) diameters.

To insert a microelectrode, a 6mm portion of the shank end is scraped bare and a 20°-30° bend made about 3mm back. This bend provides pressure to hold the electrode securely in the tube.



rev.010309

