



The IE-251A is a moderately priced intracellular electrometer complete with current passing capability and incorporating the same basic design as the more costly IE-210.

- Fixed gains of x1 and x10
- Capacity Compensation neutralizes input capacitance for up to 50 pF
- Junction potentials of up to  $\pm 200$  mV are nulled with the DC Position control
- Electrode Test provides convenient electrode resistance check
- Push button operated Buzz produces oscillations at pipette tip to facilitate cell impalement
- Convenient Probe Test port permits fast check of amplifier performance

The IE-251 is a low cost version of our popular IE-210 intracellular amplifier. The important features required for low noise, drift free recording from glass microelectrodes have been retained in this lower cost model. The IE-251A is easy to use and is an excellent choice for the budget-conscious researcher or student teaching lab. It features a very small active headstage, essentially the same as used with the more costly IE-210. Epoxy-sealed construction affords maximum resistance to saline corrosion. Its small size and low mass permit easy mounting in a micropositioner. The electrode holder supplied connects directly to the probe input.

### **Current Injection**

The injection circuitry of the IE-251A allows simultaneous stimulation and recording through microelectrode resistances up to 1000 M $\Omega$  in two ranges. Voltages at the Stimulus Input are converted to constant currents applied to the electrode. The steady state and transient components of the current injection artifact are nulled with the DC and transient balance controls. The corrected signal is viewed at the single-ended bridge output. Electrode resistance is read from the DC balance ten-turn dial.

## Overdrive Indicators

Two visual indicators call attention to overload conditions:

- Input Overdrive is illuminated whenever the probe input voltage exceeds  $\pm 1$  V, caused by either excessive current through the microelectrode or an open circuit (open or blocked electrode)
- Current Overdrive warns of excessive voltage ( $>50$  V) applied to the Stimulus Input

The IE-251A is supplied with a probe. However, an electrode holder must be purchased separately based on your glass outer diameter. Also, specify line operating voltage if other than 100-130 VAC. Typical electrode holder options are listed below with pricing information.

## Specifications

<b>Amplifier</b>	Input Impedance	$10^{11} \Omega$ shunted by 0.5 pF
	Noise Level	(0.1 Hz to 10 kHz)*
		25 $\mu$ V p-p input shorted
		250 $\mu$ V p-p, 20 M $\Omega$ at input
	Output Resistance	100 $\Omega$
	Gains	x1, x10
	Rise Time (10 to 90%)	10 $\mu$ s measured with 20 M $\Omega$ resistor
	Capacity Compensation	0 to 50 pF
	Probe Input Voltage Range	$\pm 1$ V
	DC Positioning Range	$\pm 200$ mV referred to input
	Leakage Current	Adjustable to zero
	Electrode Test	1 mV/MO
<b>Buzz</b>	Amplitude variable	0-15 V
	Frequency variable	100 Hz to 10 kHz
<b>Current Injection</b>	Bridge Balance Ranges	0 -100 M $\Omega$ and 0 -1000 M $\Omega$
	Current Injection Limit	$\pm 1$ V divided by electrode R or 0.5 $\mu$ A, whichever occurs first
	Stimulus Input Resistance	3.3 k $\Omega$
	Maximum Stimulus Input	$\pm 50$ V
	Bridge Bal. Output Resist.	100 $\Omega$
	I Monitor Output Resist.	1 k $\Omega$
	I Monitor Output Scale Factor	1V = 50 nA
<b>Physical Dimensions</b>	Case Size: 12.5 x 20.3 x 25.4 cm (HxWxD) Probe: 9.5 x 65 mm (D x L) with 1.8 m cable	
<b>Power</b>	100 -130 or 220 -240 V, 50/60 Hz, 20 VA	
<b>Probe Handle</b>	6.5 x 65 mm (D x L)	
<b>Shipping Weight</b>	4.5 kg	
<b>Warranty</b>	Two years, parts & labor	

### BioMedical Instruments Trading

Hofheimer StraÙe 63  
D- 65719 Hofheim  
Phone: +49 6192 2 91 88 66  
Fax: +49 6192 90 13 98

Email: biomedical-instruments@science-products.com



in collaboration with:



**Science Products Trading SPT AG**  
Käferholzstr. 142  
CH- 4058 Basel  
Phone +41 43 488 05 61  
Fax: +41 43 488 05 62