

# RING - DISC POTENTIOSTAT / GALVANOSTAT

**WENKING** **RDP 98**

The RDP 98 Ring - Disc - Control Potentiostat is a convenient and compact instrument for rotating ring - disc - electrode applications. A fast, powerful potentiostat, combined with two independently controlled current sinks allow to control disc currents up to  $\pm 1$  A, and ring currents up to  $\pm 500$  mA. The compliance voltage (counter electrode voltage) operates within  $\pm 25$  V. Optionally, high voltage power stages are available up to  $\pm 120$  V for operation with low - conductive electrolytes. The disc can be controlled both in potentiostatic and galvanostatic mode.



- Powerful Disc Control up to  $\pm 1$  A
- Compliance Voltage up to  $\pm 25$  V (optionally  $\pm 75$  V or  $\pm 120$ V)
- High Resolution Ring Current Amplifier
- Potentiostatic / Galvanostatic Disc Control

The fast potentiostatic control amplifier and the two current sinks operate on a common reference electrode, which is controlled to virtual ground. Two internal control voltage sources operate from -2 to 2 V for independent control of ring and disc electrode. In addition, external voltages can be superimposed,  $\pm 5$  V at the disc potential and  $\pm 5$  V at the ring electrode. The disc potential can be corrected for IR - drop by positive feed - back of the disc current. The currents are displayed on two analogue meters, the potentials are displayed on two precision digital voltmeters. All signal outputs refer to ground. The currents are converted to  $\pm 2$  V per meter full range, well adapted for A/D conversion. Optionally, a control interface (type PC-R) can be inserted for remote operation of the switch settings.

**BANK**  
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**INTELLIGENT CONTROLS**

## Specifications RDP 98

AC-Power 230 V (optionally 115 V), 50 to 60 Hz, 60 W  
Stabilisation rang + 10% and - 15% of nominal line voltage

### Potential Unity - Gain - Buffer (reference electrode input)

Input impedance  $> 10^{12}$  Ohms, 5 pF in parallel  
Input control range  $\pm 10$  V, overload protected up to  $\pm 100$  V  
Input bias current  $3 \cdot 10^{-11}$  A at 25° C ambient temperature  
Bandwidth (-3 dB) 3 MHz  
Small signal rise time less than  $10^{-7}$  s  
Slew rate 10 V /  $\mu$ s  
Potential output 1 k Ohm source resistance  
Noise  $< 30$   $\mu$ V rms  
Drift  $< 50$   $\mu$ V / 10 h, 100  $\mu$ V / 100 h, 10  $\mu$ V / °C

### Internal Control Voltage Sources (both channels)

Range  $\pm 2000$  mV  
Accuracy 2 mV deviation from dial reading  
Temperature coefficient  $< 10^{-4}/^{\circ}\text{C}$

### Potentiostat Amplifier

Control input resistance 200 k $\Omega$   
Control input range  $\pm 5$  V, overload protected up to  $\pm 150$  V  
Open loop gain typ.  $10^6$  at DC  
Roll - off 20 dB/decade of frequency  
Unity gain crossover frequency 200 kHz typ.  
Small signal rise time 2  $\mu$ s (closed loop, resistive load) typically  
Slew rate 10 V /  $\mu$ s max.  
Noise referred to 30  $\mu$ V rms, ripple included,  
Drift referred to control inputs  $< 50$   $\mu$ V / 10 h, 100  $\mu$ V / 100 h, 10  $\mu$ V / °C  
Accuracy (current meter) 2 %

### Galvanostst Amplifier

Control input  $\pm 2$  V corresponds to full range current  
Current rise time  $< 10$   $\mu$ s (cell resistance  $<$  range resistor resistance)  
Potential output carries the reference potential within 0.1%

**Power Amplifier**  $\pm 1$  A  $\pm 25$  V, optionally  $\pm 0.2$  A  $\pm 75$  V or  $\pm 0.1$  A  $\pm 120$  V

### Zero Input Resistances (Current Sinks)

Input resistance dc range 1  $\mu$ A 10  $\Omega$ , 10  $\mu$ A: 1  $\Omega$ , 1 mA: 10 m $\Omega$ , 1A: 10  $\mu\Omega$   
Drift after zero-correction  $< 100$   $\mu$ V/24 h, 200  $\mu$ V/100 h, 5  $\mu$ V/°C from virtual zero  
Equivalent noise of input 20  $\mu$ V typ. at full bandwidth  
Current ranges (disc) 100 nA, 1  $\mu$ A, 10  $\mu$ A, 100  $\mu$ A, 1 mA, 10 mA,, 100 mA, 1 A  
Current ranges (ring) 100 nA, 1  $\mu$ A, 10  $\mu$ A, 100  $\mu$ A, 1 mA, 10 mA,, 100 mA, 1 A  
Current recorder output 2 V / meter full scale deflection  
Current-to-voltage conversion better 0,25%  
Open loop gain dc  $> 300$  k  
Roll-off 20 dB / decade of frequency  
Unity gain crossover 300 kHz

### Dimensions

Front panel 483 x 178 mm, Housing 540 x 200 x 382 mm (19" 4 HE)  
Weight net 15 kg, gross approx. 20 kg