

LONG - TERM VOLTAGE INTEGRATOR WENKING MODEL

EVI 95

According to Faraday's Law, the quantity of ions being deposited, dissolved, reduced or oxidised at a potential controlled working electrode is strictly proportional to the integral of the cell current, provided that a specific reaction can be separated sufficiently from adverse effects. The integrator in co-operation with a potentiostat is a valuable instrument for quantitative analysis in an electrochemical cell.

Model EVI 95 is a long - term precision integrator provided for use in combination with potentiostats. A precision analogue integrator circuit integrates the input signal up to a precisely set voltage level detected by a discriminator circuit. At this discrimination level the integrating capacitor is discharged to zero immediately and charged again. The number of discharges is counted by a dual six decade electronic counter, separately for each polarity. The combination of the analog integrator with the digital counter circuit offers very fine resolutions from extremely short integration periods (less than 1 s) to more than 10000 hours for the combination. Every digit of the 6 decade counter can be adapted by the range switch from 1 Volt x second [Vs] at maximum sensitivity to 1 kVs at lowest sensitivity range in 8 steps.



Since all Wenking potentiostats have a built - in current to voltage converter, the integral measured in Vs can be converted into As [Coulombs] by simple calculation. As our potentiostats usually have an output of 2 V per full range, you have only to multiply the current range setting with the integrator range.

The calculation to obtain As or Coulombs from the indicated integration result in Vs is trivial.

Example: The current - to voltage conversion may be 2 V / full range. If the integrator is set to 1 Vs, the current integral is

$$(1 \text{ V} \times \text{s}) \times (1 \text{ } \mu\text{A} / 2 \text{ V}) = 0.5 \text{ } \mu\text{As per tick of the counter.}$$

Fractions of the count are shown on an analogue meter, and fed to an analogue output for fine resolution measurements.

Wide input range **1 Vs to 1kVs mVs in 10 sensitivity ranges**

Readout **(counter + meter reading) up to 99999.99**

The integration period is set by manual operation of push - buttons - switches, unless it is already controlled by the potentiostat program. A trigger input provides for automated integration by external triggering.

An analogue output feeds allows to read the meter reading by external devices. This technique is preponderantly applied if the integration period does not exceed 1 hour.

Specifications Model EVI 95

Power supply	115 or .230 V, 50 to 60 Hz, 30 VA
Stabilisation range	+ 10% to - 10% of rated voltage
Characteristics analog integrator	
Range input resistance	100 k, 200k, 500k ...100 M
Input offset current	less than 10^{-12} A at 25°C
Short - term offset voltage drift	less than 2 μ V / h and 10 μ V/°C
long - term offset voltage drift	less than 20 μ V per 100 hours
Integrating capacitor	1 μ F \pm 1 %, temperature coefficient 5×10^{-5} /°C
leakage discharge	typ. 0.02 % /min
Discharge voltage level on integrating capacitor	10 V \pm 1%, adjustable to compensate for capacitor tolerance standardised against external standard
Discharge period	100 μ s
Drift of discharge level	less than 10^{-4} / °C and 0.2 % per Year
Ranges	
10 voltage integration ranges	1 digit or f. s. d. of built - in meter corresponds to 1 Vs, 2 Vs, 5 Vs ...1000 Vs
Max. input voltage in these ranges	15 V, 25 V, 100 V..... 100 V
Accuracy of range resistors	0,1% (1 Vs to 10 Vs), 0,25% (20 Vs to 200 Vs), 1% above
Built - in meter	
Meter reading	\pm 10 V f. s. d. (voltage on integration capacitor)
Digital readout	
Battery Lifetime	10 years (design lifetime)
Digital indication range	0 to \pm 999999digits, separately for each polarity
Dimensions	
Dimensions	245 * 210 *120 mm
Weight net	3 kg

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