



Manual of Operations

IMPORTANT!

Read the following before using this equipment:
Carefully Follow all instructions and observe all precautions given in this book



Specifications

Operation Modes

Item		Contents
Sweep	CV	Cyclic Voltammetry
	LSV	Liner Sweep Voltammetry
Single Step	SSCA	Single Step Chrono Amperometry
	SSCP	Single Step Chrono Potentiometry
Double Step	DSCA	Double Step Chrono Amperometry
	DSCP	Double Step Chrono Potentiometry
Misc.	REST	Rest Potential Measurement
	DIAG	Diagnostic Check

Potentiostat

Item		Contents
Max Output Voltage (CE-WE)		$\pm 12\text{ V}$
Max Current Output		$\pm 100\text{ mA}$
Set Voltage (WE-RE)	Range	$\pm 2\text{ V}$ in the $\pm 2\text{ V}$ Range
		$\pm 6\text{ V}$ in the $\pm 6\text{ V}$ Range
	Resolution	.060 mV
		.032 mV
	Accuracy	$\pm 0.2\%$ per $\pm 1\text{ mV}$ of reading
	Response Time	$< 5\ \mu\text{s}$
Conditions (no load, response: TOP)		
Control Response Switching	Slow, Medium, Fast	

Galvanostat

Item		Contents
Max Output Voltage (CE-WE)		$\pm 12\text{ V}$
Max Current Output		$\pm 100\text{ mA}$
Set Voltage (WE-RE)	Range	$\pm 100\text{ mA}$
	Accuracy	100 mA ~ 10 μs Range: $\pm 0.5\%$ of reading $\pm 0.2\%$ FS
		1 μs ~ 10 nA Range: $\pm 2\%$ of reading $\pm 0.2\%$ FS
	Response Time	$< 100\ \mu\text{s}$
		Conditions (Load: 10 Ω , 100 mA Range, Response: Fast)
Control Response Switching	Slow, Medium, Fast	

Function Generator

Item	Contents
Potential Set	±6.000V ~ 0.000V (4 digit set)
Potential Set Range	2 Ranges: 2V, 6V
Potential Set Resolution	1 mV
Potential Sweep Speed	7 Range Volts per Second Ranges 10V, 1V, 0.1V, 0.01V, 0.001V Volts per Minute Ranges 0.001V, 0.01V
Potential Sweep Resolution	2V Range: 62.50 μV 6V Range: 187.5 μV (by 16 bit digital analog converter)
CV Cycle number	1~99 cycle and continuous (stops at data memory full)
Step Time Set	2 Range 4 Digit values set at each range Sec- 0.001~9.999sec (1ms~approx. 10sec) Min- 0.1~9.999min (6 sec~approx. 16.6h)



Data Measurement

Item	Contents
Voltage Detection Range	2 Ranges: 2V, 6V, and Auto Range
Voltage Detection Input Impedance	1x 10 ¹¹ Ω
Current Detection Range	8 Ranges : .1mA, .01mA, .001mA : .1μA, .01 μA, .001 μA : .1nA, .01 nA and auto range
Measuring Filter Low Pass Filter	CIRECT (without filter) HIGH (cut off frequency 1kHz) LOW (cut off frequency 10hz)
Data Sampling Interval	20μs, 100μs, 1ms, 10ms, 100ms, 1s, 10s, 1 min. and auto sampling
Analog/Digital Conversion	16 bit analog/digital converter
Data Memory	Max 100,000 Sampling data

Data Output

Item		Contents		
Potential Output	Terminal	BNC		
	Output Impedance	340 Ω		
	Conversion Rate	1:1 (Max $\pm 6V$, independent from V Range)		
	Accuracy	$\pm 0.2\%$ per $\pm 1mV$ of Reading		
	Filter (low pass)	10Hz, 1kHz, DIRECT		
Current Output	Terminal	BNC		
	Output Impedance	340 Ω		
	Conversion Rate	10V/ full scale of each range		
	Accuracy	100 mA ~ 1 μA Range: $\pm 0.5\%$ of reading $\pm 0.2\%$ FS		
		1 μA ~ 1NA Range: $\pm 2.0\%$ of reading $\pm 0.2\%$ FS		
Filter (low pass)	10Hz, 1kHz, DIRECT			
Current Output Range	Terminal			
	Output Impedance	340 Ω		
	Analog Signal Voltage Value	Current Range	Voltage (100mV Interval)	
		10nA	100mV	
		100nA	200mV	
		1 μA	300mV	
		10 μA	400mV	
		100 μA	500mV	
		1mA	600mV	
		10mA	700mV	
100mA	800mV			
Bath Voltage	Terminal			
	Output Impedance	340 Ω		
	Conversion Rate	1.1 (max $\pm 12V$)		

System Warnings

Item	Contents
CE OVER	Alarms when exceeding $\pm 12V$
V RANGE OVER	Alarms at $\pm 110\%$ of Voltage Range
I RANGE OVER	Alarms at $\pm 110\%$ of Current Range
CURRENT RANGE LIMITS	Clamps at 120% of each current range

Data Processing and Display

Item	Contents
Display	LCD Size: 6.5" Resolution: 640 x 480 Color: 65536 colors R:5/G:6/B:5 Refresh Start: 1/60s (16.66ms) Interface: LVDS Serial R:1/G:1/B:1 LCD Backlight: LED
USB Memory	Version: USB 2.0 set on screen Transfer Speed: Up to 12Mbps Limitations: Extension of USB Port Not Possible
Ethernet Communications	Communications speed: 10/100 Base-T IP Address: Set on screen (Default: 192.168.0.1) Subnet Mask: Set on screen (Default: 225.225.225.0) Default Gateway: Set on screen (Default: 192.168.0.1) PORT: 5000

Product Dimensions

Item	Contents	
Main Unit	Outer Sizes	260mm x165mm x 300mm (WxHxD)
	Weight	~5 kg
Power Source	Voltage	AC120V 50/60Hz 0.6A
		AC240V 50/60Hz 0.3A
Environment	Operation Temp.	0°C ~ 40°C
	Operation Humidity	10% ~ 90% (without dew)
	Storage Temp.	-10°C ~ 50°C
	Storage Humidity	10% ~ 90% (without dew)
	Accuracy Guaranteed Operation Temp.	23°C ~ ±5°C



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