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MATERIALS MANAGEMENT DIVISION
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(Rfx No. 6100001875)

Technical Specification for Add-on Components for existing Electrochemical Workstation

Sr. no	Item Description	Qty	Complied (Yes/No)	Additional Info if any
I.	<p>*Potentiostat and rotator with accessories:</p> <p>i. Wave Driver 200 EIS Bi-Potentiostat/Galvanostat: Qty 01 No. (Included) Includes the items listed below: -</p> <ol style="list-style-type: none"> 1) Wave Driver 200 Integrated Bi-Potentiostat / Galvanostat with EIS (It includes power adapter, USB cable, and dummy/calibration cell) 2) Software: After Math Data Acquisition 3) Cell Cable Kit (7-lead, includes alligator clips) <p>General Specifications: Power Supply Input: 100 to 240 VAC, 1.4 to 0.7 A, 50 to 60 Hz; C14 type connector</p> <p>Applied and Measured Current:</p> <ol style="list-style-type: none"> 1) Ranges (8): ± 100 nA to ± 1 A, support auto range 2) Resolution: 3.13 pA, 0.003% of range 3) Practical Range: 20 pA to 1.0 A 4) DC Accuracy: $\pm 0.2\%$ of setting; $\pm 0.05\%$ of range <p>Applied and Measured Potential:</p> <ol style="list-style-type: none"> 1) Ranges: ± 15.0 V, ± 10.0 V, ± 2.5 V 2) Resolution: 78 μV, 0.003% of range 3) DC Accuracy: $\pm 0.2\%$ of setting, $\pm 0.05\%$ of range 4) CV Scan Rate: 10 μV/s to 75 V/s <p>Other Technical Specification</p> <ol style="list-style-type: none"> 1) Compliance Voltage: $> \pm 17$ V 2) Noise and Ripple: < 10 mVRMS 3) Slew Rate / Rise Time: 10 V / μsec (on fastest speed setting) 4) Input Impedance: $> 10^{12}$ Ω in parallel with < 10 pF 5) Input Current: < 10 pA leakage/bias current at 25°C 6) Clock Resolution: 10 ns (minimum) 7) Point Interval: 80 μs (minimum) <p>Impedance:</p> <ol style="list-style-type: none"> 1) Frequency Range: 10 μHz-1MHz 	1 set		

- 2) Voltage Excitation Setpoint: 1 mV-200 mV peak, $\pm 10\%$ of setting
- 3) Current Excitation Setpoint: 0.01%-100% of current range, $\pm 10\%$ of setting, 200 mA max
- 4) Electrochemical techniques: Supports all standard Electrochemical Methods

ii. WaveVortex 10 Electrode Rotator: Qty 01 No (Included)

(included power adapter and motor control cable) Details specifications for

WaveVortex 10 Rotator: **ROTATION**

RATE:

- 1) **Rate Accuracy:** 200 to 8000 RPM: Accurate to within $\pm 1\%$ of display reading
- 2) **Controls:** Side Panel On/Off Switch, 10-turn pot for Rate Control, 4-digit LCD display
- 3) **Enclosure Interlock:** Interlock prevents rotation when enclosure window is in raised position. Front panel LED indicated enclosure interlock state.

MOTOR:

- 1) **Motor Power:** 11 W
- 2) **Control Method:** Closed loop servo-system (PWM) Temperature-compensated tachometer mounted on motor shaft
- 3) **Max. Continuous Torque:** 18.7 millinewton-meter
- 4) **Motor Protection:** Motor current is electronically limited

ELECTRICAL:

- 1) **Power:** AC Mains: 100 -240 V AC, $\pm 10\%$, 50Hz; 2A
- 2) **Requirements:** DC Supply: 24 V DC, 1.5A

iii. MSR Electrode Rotator with CE and ETL

Marks: Qty 01 No (Included)

Specifications:

- 1) **Power Requirements:** AC Mains: 240 V AC; $\pm 10\%$, 50 Hz; 2 Amps
DC Supply: +30 V, -24 V DC
- 2) **Motor:** 1/50HP permanent magnet DC
- 3) **Speed Control:** Closed loop servo system; temperature compensated tach generator is mounted on the motor shaft and provides rotational speed information.

	<ul style="list-style-type: none"> 4) Speed Range: 50 to 10,000 RPM 5) Accuracy: within 1% of LCD panel reading 6) Controls: Rear Panel On/Off Switch, 10-turn Pot for Rate Control, 4.5-digit LCD display 7) Motor Protection: 2.0-amp thermal type circuitbreaker; current limited power supplies 			
II.	<p>Three electrode complete cell kit with accessories</p> <p>i) Standard Platinum Counter Electrode Kit: Includes isolation tube and adapter to fit 14/20 port: Qty 01 No(included)</p> <p>Specification:</p> <ul style="list-style-type: none"> 1) Pt wire OD = 0.5 mm 2) Approximate surface area = 4.7 cm² 3) 6.9 mm OD x 150 mm epoxy tube shroud <p>ii) Double Junction Silver Chloride (Ag/AgCl) Ref. Electrode: Includes 14/20 PTFE adapter, storage bottle, bottle of outer filling solution: Qty 01 No(included)</p> <p>Specifications:</p> <ul style="list-style-type: none"> 1) Standard Potential: 0.199 V vs. NHE 2) Inner Filling Solution: 4 M KCl with AgCl 3) Outer Filling Solution: 10% KNO₃ <p>iii) Single Junction Mercury Oxide (Hg/HgO) Reference Electrode: Includes 14/20 PTFE adapter, storage bottle: Qty 01 No(included)</p> <p>Specifications:</p> <ul style="list-style-type: none"> 1) Standard Potential: 0.098 V vs. NHE 2) Filling Solution: 4.24M KOH <p>iv) Change Disk RDE Tip: Qty 01 No(included)</p> <p>Specifications:</p> <ul style="list-style-type: none"> 1) Disk OD = 5.0 mm; Change Disk Tip 12.0mm OD PTFE shroud and PCTFE body 2) Accepts disk inserts 5.0 mm OD x 4.0 mm thick <p>v) Gold Disk Insert: Qty 01 No(included) 5.0 mm OD x 4.0 mm thick, mirror polished</p>	1 set		

vi) **Nickel Disk Insert: Qty 01 No (included)**
5.0 mm OD x 4.0 mm thick, mirror polished

vii) **Non-Aqueous Glass Frit Standard Reference Electrode: Qty 01 No (included)**
electrode includes PTFE-capped Ag wire electrode (100 mm long wire), 9.5 mm OD glass tube (130 mm long), FEP heat shrink and Varapor100 glass frit, and 14/20 PTFE adapter

viii) **Platinum Ring Assembly: Qty 01 No (included)**
1) Disk OD = 5.0 mm; Ring OD = 7.50 mm; Ring ID = 6.50 mm; Change Disk 15.0 mm OD PTFE shroud
2) Accepts disk inserts 5.0 mm OD x 4.0 mm thick

ix) **Glassy Carbon Disk Insert: Qty 01 No (included)**
5.0 mm OD x 4.0 mm thick, mirror polished

x) **Hydrogen reference electrode Hydro Flex: Qty 01 No (included)**
1) Material: PTFE (Polytetrafluoroethylene)
2) Contact socket: gold-plated socket for 2 mm plugs
3) Sensor element: Palladium-Platin gas diffusion electrode
4) Hydrogen source: replaceable hydrogen cartridge (88010), adjustable to 1 - 12 months, 6 months recommended Scope of Delivery:
5) 1 x Hydrogen RE HydroFlex inclusive hydrogen cartridge
6) 1 x 80077: Activation sticker

III.	<p>Other Accessories</p> <p>i) MSR Spring-Loaded Brush Assembly: Qty 04 Nos (included) Includes hex key, nylon mount</p> <p>ii) Wave Vortex 10 Standard Brush Assembly : Qty 02 Nos (included) contains one, standard silver-graphite brush</p> <p>iii) Wave Driver Bipotentiostat Cell Cable : Qty 01 No(included) D-Shell connector to 7 banana plugs</p> <p>iv) Banana Cable (Black or any color) : Qty 05 Nos (included) 36 inches long</p>	1	Set		
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