



Procedure no. ZP/56/008/D/22

Attachment no. 7 to ORS

Detailed Description of Subject of Procurement

Fully Automated Fuel Cell Test Station:

Subject of the procurement	Quantity
Technical documentation	1
<p><u>Fully Automated Fuel Cell Test Station:</u></p> <ul style="list-style-type: none"> - 100:1 turndown (max:min flow) on all Mass Flow Controllers (MFC), - 80 NLPM max. humidified anode flow, 1 x MFC: H₂, - 200 NLPM max. humidified cathode flow, 1 x MFC: Air, - 316 stainless steel (or higher grade) for all di-water and humidified gas-handling components, - Automatic contact humidification module (up to 90C dew point, higher temperatures available), - Contact Humidification with Rapid Response Dew Point for both anode and cathode sides. 1-2 second dew point transient response time for pure H₂ and pure Air streams, - Automated bypass with 100% full isolation of humidifier which permits delivery of facility-supplied gas directly to stack, - Electric reheat module (up to 110C inlet gas), - Nitrogen purge rotameters on anode and cathode, activated on e-stop or user command, - Automatic back pressure control module (0-3 Barg), - Exhaust cooling heat exchangers, - Stack end-plate heater PID controllers, 2x 2A max. (1ph AC mains voltage), - Automated liquid coolant/heating module with conductivity monitoring: 0.5-5 LPM, 40-90C, 0-3 Barg, - Programmable air cooled load bank with dual range operation (10%/100%). Maximum: 2KW, 75V, 350A, max. current available down to ~0.0V at stack - Load bank with an analogue input for an external AC perturbation signal - Load bank dynamic response: min. 10KHz, - 20 channels of CVM (Cell Voltage Monitor) included (+/- 5V range, +/- 1mV accuracy), - Automation software, - H₂ gas detector (CE, ATEX, UL, CSA) for test station E-stop and warning, - Facility requirements: 3 phase electrical power, pressurized fluid supplies (di water, cooling water, reactant gases), exhaust gas handling, water drain, flammable/hazardous gas detection, fume extraction, - 3 Gas lines of CO, CO₂, CH₄ includes bulkhead connector, safety shutoff valve and 1 MFC), - 2 Gas lines for corrosive gases, H₂S, NH₃ includes bulkhead connector, safety shutoff valve and 1 MFC, - Possibility of Dead Ended Operation, - Bypass ion filtration system on coolant loop. For deionized water or WEG operation, - Integrated Carbon Monoxide detector, CE, ATEX rated, 	1



**POLITECHNIKA
GDAŃSKA**

WYDZIAŁ CHEMICZNY



**UCZELNIA
BADAWCZA**
INICJATYWA DOSKONAŁOŚCI

<ul style="list-style-type: none">- User training,- CE marking and conformity,	
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