APPROVED

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CBI

IDENTIFICATION			
SPECIFICATION 801			
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OFFICE LIGO		REVISION 1D	
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TITLE

Residual Gas Analyzer Specification

PRODUCT

RGA's For The Pump Port Hardware

Note: Revisions are not indicated on this specifcation.

1.0 SCOPE

1.1 This specification sets forth the minimum requirements for ten residual gas analyzers (RGA). The RGAs will consist of a Balzers type 421-1 controller with a type 125 RGA head in the 1 to 100 AMU range. The unit will be supplied complete with faraday cup, an ion counter, a 90° Secondary Electron Multiplier (SEM) and all necessary software and hardware including the QAM quantitative analysis module software. Nine of the RGAs will be installed at intervals of approximately 250 meters along a 2 km evacuated tube. The units will be operated simultaneously and the data will be utilized to solve a series of simultaneous equations to quantify and locate an air leak anywhere within the two kilometer length of the evacuated tube. The units will also identify and quantify the outgassing rates of the most abundant seven to 20 gasses in the evacuated tube. Typical operation will utilize 42 AMU values recorded in the Multiple Ion Detection (MID) mode. Other modes will be utilized for calibration of individual gasses and pump speed calculations.

1.2 The RGA's shall be tagged RGA-1 through RGA-10

1.3 Vendor shall indicate the tag number of all items on drawings.

1.4 Vendor shall indicate the equipment tag numbers in all correspondence with CBI.

1.5 Vendor shall contact CBI if any of the specifications set forth in this document detracts from the performance or useful life of the RGAs or unnecessarily increases the cost.

2.0 DESIGN

2.1 The analysis system will consist of nine operating RGA's with one spare RGA. The nine units will be installed every 250 m along a 2 km section of evacuated tube.

2.2 The vendor shall provide the following Balzers units or other vendor units of equal capabilities:

2.2.1 10 units — QMG 421-1 (RGA controller QMS 421-1 with the Quadstar 421 software with a corporate agreement).

2.2.2 10 units — QMA 125 with a 1 to 100 AMU range, 90° SEM, faraday cup and grid ion source capable of faraday cup, SEM and ion counting modes. The units will be vacuum annealed

2.2.3	10 units	Ion counting option, IC 421 and CP 400 (PL 410 is not required).
2.2.4	10 units	Cabling for connection of all components.
2.2.5	1 unit (corp. agreement)	QAM Quantitative Analysis Module software.
2.2.6	3 units	spare filaments.

2.3 Control

2.3.1 The vendor shall provide the capability of connecting and operating the nine RGAs from a single computer simultaneously. CBI will supply the computer and have the vendor provide communication cards or other hardware and software necessary. CBI would supply an IBM clone which is manufactured by Gateway. The computer will have a Pentium processor. The vendor shall specify the minimum computer requirements for hard drive memory, RAM memory, clock speed, software, etc. If CBI's computer supply preference inhibits the capabilities of the vendor or the RGA, the vendor may supply the computer as well as the other hardware.

2.3.2 Cable lengths for the above communications system shall be as follows
2 cables 325 m long between RGAs
7 cables 250m long between RGAs
1 cable 10 meters long to the computer from any one of the RGAs

3.0 INFORMATION TO BE PROVIDED IN THE QUOTATION

3.1 Pricing and delivery of the base bid items specified.

3.2 Technical description of the components and/or software required to connect all RGA's to the same computer.

3.3 The limitations, if any, of the communication system places on the RGA operation, such as scan speeds, channel limitations or cycle times, etc.

4.0 INFORMATION TO BE PROVIDED AFTER ORDER

4.1 Confirm delivery schedule

4.2 Provide manuals for software and hardware

4.3 Provide specific instructions for integrating communication hardware into the RGA software and hardware.