

ITEM OPPORTUNITY SYNOPSIS

Scouting Number:	2024-226
Name of the item to be scouted:	Paramagnetic Oxygen Analyzer
State item to be used in:	None

Describe the Item:

<p>Please describe the item application/the end use of the item.</p>	<p>The National Oceanic and Atmospheric Administration (NOAA), Oceanic and Atmospheric Research (OAR), Earth Systems Research Laboratories (ESRL), Global Monitoring Laboratory (GML) has used a Beckman E2 paramagnetic oxygen analyzer to measure the percent oxygen in gas cylinders containing natural air or a mixture of oxygen and nitrogen (synthetic air) since the mid-1980s. The Beckman instrument has failed and is not repairable due to its age (~40 years old). The Industrial Physics PM710 has performance characteristics that are comparable with the current Beckman instrument. The GML needs a new bench-top paramagnetic oxygen analyzer like the PM710 in order to maintain continuity with previous work conducted over the last 30 years, and maintain a similar level of uncertainty in calibration work related to measurements.</p>
--	---

Supplier Information:

Type of Supplier Being Sought (select from the list below):	
Manufacturer	x
Contract Manufacturer	
Distributor	
Other (Please Specify)	
Reason for Scouting Submission (select from the list below)	
2nd Supplier	
Price	
Re-Shore	
Past supplier no longer available	
New Product Startup	
BABA	x
Other (Please Specify)	

Summary of Technical Specifications and Performance Requirements:

<p>Describe the manufacturing processes (elaborate to provide as much detail as possible)</p>	<p>electronic assembly see attached specs</p>
<p>Provide dimensions / size / tolerances / performance specifications of the item</p>	<p>The instrument utilizes a magneto-dynamic (dumb-bell) transducer for high performance oxygen analysis. It has a performance level of less than or equal to 0.05% precision on percent level oxygen, which is required to ensure the continuity and similarity within GML's research. General Specifications: PM710 Bench/Panel Mount 190H x 237W x 410D (mm) 8.5kg Technical Specifications: Measurement range: Autoranging from 0.01 to 100% O2 Detection limit: 0.01% O2 Display resolution: 2 decimal places (0.01 to 99.99%) Display type: 5-digit High Visibility LED Response time: 90% of reading (T90) less than 6 seconds Linearity: Better than ±0.1% O2 Zero-point drift: Better than ±0.1% per week Repeatability: Better than ±0.03% O2 Pressure compensation: Automatic compensation option Temperature influence at zero: < ±0.05% O2/°C Temperature influence span: < ±0.20% of measured value /°C Barometric pressure influence on zero: No influence Barometric pressure influence span: 1% air pressure change causes 1% change in reading without automatic compensation (option) Operating Conditions: Sample Gas Pressure: 0.1 to 5 BarG Ambient Temperature: -10 to +45°C Sample Connections: 1/8" OD Compression fittings Communications: RS232/485 Power Requirements: Power Supply: 230/115 Vac, 50/60 Hz at 40VA Options: High/Low Alarms: 2-volt free changeover contacts. Rated 240V, 3A Analogue Outputs: Scalable 4-20mA (0-20mA), 0-10V, 0-100mV all isolated Pressure Compensation: Integrated absolute pressure compensation, 800-1100 mBar Sample Stream Options: Internal sample pump, Flow alarm, Pressure regulator Ex-Proof Sensor Housing: Use this option for explosive gas mixtures (e.g. H2, Butane, CO, H2S etc.) Features and Benefits: Paramagnetic sensor with PID temperature control for best in class performance Optional barometric pressure compensation for purity analysis Auto calibration option Large auto-ranging LED display Specific to oxygen Excellent linearity and accuracy Operator Interface/Diagnostics: User-friendly menu Read-only mode available Diagnostic capabilities Fault alarms Output and Alarm Options: For charting, process control, or remote monitoring: RS232 / 485 Analogue outputs (three channels) High / low alarms Fault alarms Sampling Systems: Bypass flowmeter Pressure regulator Sample pump Flow alarm</p>

List required materials needed to make the product, including materials of product components, if applicable	Unknown except as provided on attached specs sheet
Are there applicable certification requirements?	
Yes	
No	x
Please explain:	
Are there any applicable regulations that apply to the production of this item?	
Yes	
No	x
Please explain:	
Are there any other standards / requirements?	
Yes	
No	x
Please explain:	
NAICS CODES:	
NAICS 1	334516 Analytical laboratory instrument manufacturing
NAICS 2	
Additional Comments:	
Additional technical comments:	Any offered products must meet the performance levels identified so that GML's research continuity is maintained. Measurements have been ongoing for 30 years, and data consistency must be maintained to the highest extent possible.
Volume and Pricing:	
Estimated Potential Business Volume (i.e. #units per day, month, year):	One-time purchase
Estimated Target Price/Unit Cost Information:	Quantity of 1 PM710 \$13,222.00 each
Delivery Requirements:	
When is it needed by? (Immediate, 30 days, 6 months, etc.)	Anticipate award of contract before the end of the current fiscal year (09/20/2024), with delivery by 60 days after date of award.
Describe packaging requirements (i.e. individually/group packaging, etc.)	N/A
Where will this item be shipped?	Boulder, CO
Additional Comments:	
Is there other information you would like to include?	This is a Simplified Acquisition, which has a shorter lead time to completion than an action over \$250,000.00. It is expected that this requirement will be awarded within the next 30-60 days, and any timely scouting (requested completed within 15 days from submission) would be appreciated to align with Simplified Acquisition requirements for posting and the Buy American Act Waiver process. Department of Commerce Point of Contact: Marcelle Loveday Director, Acquisition Policy & Workforce Office of Acquisition Management MLoveday@doc.gov Please copy scouting@nist.gov on all correspondence.



PM710
Bench/Panel Mount
190H x 237W x 410D (mm)
8.5kg

PM720
IP66/NEMA 4X
Wall Mount/Weatherproof
460H x 380W x 160D (mm)
16.5kg

PM730
Rack Mount 4U - 19 inch
Houses 1 or 2 Analysers
178H x 484W x 410D (mm)
10.1kg (single unit)

Technical Specifications

Measurement range	Autoranging from 0.01 to 100% O ₂
Detection limit	0.01% O ₂
Display resolution	2 decimal places (0.01 to 99.99%)
Display type	5 digit High Visibility LED
Response time	90% of reading (T90) less than 6 seconds
Linearity	Better than ±0.1% O ₂
Zero point drift	Better than ±0.1% per week
Repeatability	Better than ±0.03% O ₂
Pressure compensation	Automatic compensation option
Temperature influence at zero	< ±0.05% O ₂ /°C
Temperature influence span	< ±0.20% of measured value /°C
Barometric pressure influence on zero	No influence
Barometric pressure influence span	1% air pressure change causes 1% change in reading without automatic compensation (option)

Operating Conditions	
Sample Gas Pressure	0.1 to 5 BarG
Ambient Temperature	-10 to +45°C
Sample Connections	1/8" OD Compression fittings
Communications	RS232/485

Power Requirements	
Power Supply	230/115 Vac, 50/60 Hz at 40VA

Options	
High/Low Alarms	2 volt free changeover contacts. Rated 240V, 3A
Analogue Outputs	Scaleable 4-20mA (0-20mA), 0-10V, 0-100mV all isolated
Pressure Compensation	Integrated absolute pressure compensation, 800-1100 mBar
Sample Stream Options	Internal sample pump, Flow alarm, Pressure regulator
Ex-Proof Sensor Housing	Use this option for explosive gas mixtures (e.g. H ₂ , Butane, CO, H ₂ S etc)

System Illinois have over 30 years experience of providing analysis solutions for a wide range of industries. From our manufacturing plants in the UK and U.S we produce gas analysers for industrial process industries, headspace analysers for monitoring gas flushing of food products and our range of permeation analysers.

Paramagnetic analysers for high purity oxygen with full percent range capability



Features & Benefits

- Paramagnetic sensor with PID temperature control for best in class performance
- Large autoranging LED display
- Specific to oxygen
- Optional barometric pressure compensation for purity analysis
- Excellent linearity and accuracy
- Auto calibration option

<p>Systech Instruments Ltd (UK) 17 Thame Park Business Centre, Wenman Road, Thame, Oxfordshire OX9 3XA Tel: +44 (0)1844 216838 Fax: +44 (0)1844 217220 E-mail: sales.uk@systechillinois.com www.systechillinois.com</p>	<p>Illinois Instruments, Inc (U.S) 2401 Hiller Ridge Road Johnsburg, Illinois 60051 U.S.A Tel: +1 815 344 6212 Fax: +1 815 344 6332 E-mail: sales.us@systechillinois.com www.systechillinois.com</p>	<p>Illinois Instruments (Thailand) 26/6 Ladprao 23, Jatujak, Bangkok 10900 Thailand Tel: +66 (0)2030 5851 Fax: +66 (0)2030 5850 Email: sales.ap@systechillinois.com www.systechillinois.com</p>	<p>Systech Illinois (China) Room 1107-1108 Forte Building No. 910 Quyang Rd, Hongkou district, Shanghai, China 200437 Tel: +86 21 65533022 Fax: +86 21 65539651 Email: info@systechillinois.cn www.systechillinois.cn</p>
--	---	--	--

Unmatched in High Performance On-Line Oxygen Analysis

Applications

Chemical / Petrochemical

Chemical Production
High Purity Gas Production
Hydrocarbon Refining
Natural Gas Transmission

Curing

Electron Beam
Ultraviolet

Electronics

Solder Powder Production
Semiconductor Furnaces
Gas Quality

Metals

Heat Treating / Annealing
Steel Production
Alloys and Powdered Metals

Pharmaceutical

Inert Packaging
Vessel Blanketing
Fermentation

Process

Ceramics
Combustion Analysis
Contact Lens Manufacturing
Food Packaging
Glass Fibre Optics
Inert Gas Welding
Lamp Manufacturing
Air separation

General

Controlled Environments
R & D
Glove Boxes
Oxygen Deficiency

Unmatched Performance

Systech Illinois has long been recognised worldwide as a leader in oxygen analysis.

Utilising the well proven magneto-dynamic (dumb-bell) transducer in the PM700 Systech Illinois offers the best in class of high performance oxygen analysis. These highly advanced instruments incorporate user-friendly software to provide accurate, reliable results.

Whatever your measuring range, the PM700 series has an analyser to suit your needs.

Cabinetry & Mounting

Three different configurations to match your needs.

- NEMA 4X / IP66 waterproof and weatherproof
- 19 in. rack mount
- Panel or bench mount

Operator Interface /Diagnostics

- User-friendly menu
- Read-only mode available
- Diagnostic capabilities
- Fault alarms

Outputs & Alarm Options

For charting, process control, or remote monitoring

- RS232 / 485
- Analogue outputs (three channels)
- High / low alarms
- Fault alarms

Sampling Systems

- Bypass flowmeter
- Pressure regulator
- Sample pump
- Flow alarm

Sensor Selection

Now you can match sensor to application for the best possible reliability and performance. All Systech Illinois sensors are easily calibrated to ambient air. For ISO purposes and in specific applications, traceable calibration gases can be used to meet the most demanding quality assurance programmes.

PM720



PM730

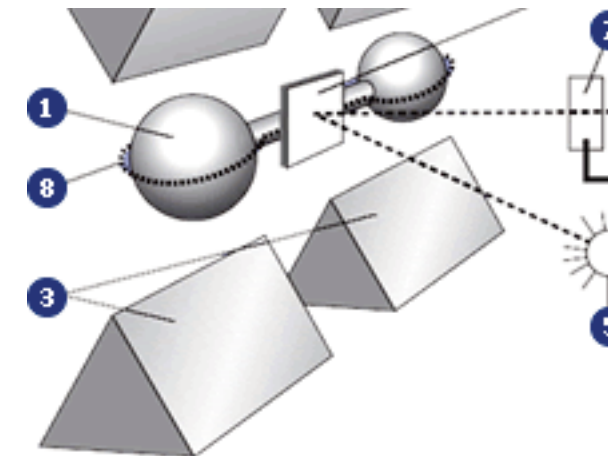


PM710



Principle of Operation

The paramagnetic susceptibility of oxygen is significantly greater than that of other common gases, and for this reason the molecules of oxygen are attracted much more strongly by a magnetic field than the molecules of other gases. Most other gases are repelled by the magnetic field.



- | | |
|------------------|----------------|
| 1 Glass dumbbell | 5 Light source |
| 2 Pole shoe (N) | 6 Mirror |
| 3 Pole shoe (S) | 7 Photo diodes |
| 4 Measuring cell | 8 Wire loop |

The principle of measurement (Faraday's method) is based on a sensor in which a dumbbell comprising two nitrogen-filled spheres is arranged in rotational symmetry within a magnetic field. If the sample gas contains oxygen it is drawn into the magnetic field. The nitrogen inside the glass spheres has the opposite magnetic polarization and is forced out of the field, causing the dumb-bell to rotate.

The degree of rotation is directly proportional to the oxygen concentration. A mirror reflects a beam of light onto a pair of photocells. When the dumb-bell starts to rotate, a potential difference is generated at the photocells. The resulting current is amplified and conducted around the dumbbell through windings. The current flow generates an electromagnetic counter moment which causes the dumb-bell to return to its original position.

The current needed to maintain the dumb-bell in its null position is directly proportional to the oxygen concentration.