MBA-100 Metal Bayard-Alpert Ion Gauge

INSTRUCTION MANUAL

Manual No. 699908211
Revision B
July 2000
MBA-100 Metal Bayard-Alpert Ion Gauge
Warranty

Products manufactured by Seller are warranted against defects in materials and workmanship for twelve (12) months from date of shipment thereof to Customer, and Seller’s liability under valid warranty claims is limited, at the option of Seller, to repair, to replace, or refund of an equitable portion of the purchase price of the Product. Items expendable in normal use are not covered by this warranty. All warranty replacement or repair of parts shall be limited to equipment malfunctions which, in the sole opinion of Seller, are due or traceable to defects in original materials or workmanship. All obligations of Seller under this warranty shall cease in the event of abuse, accident, alteration, misuse, or neglect of the equipment. In-warranty repaired or replaced parts are warranted only for the remaining unexpired portion of the original warranty period applicable to the repaired or replaced parts. After expiration of the applicable warranty period, Customer shall be charged at the then current prices for parts, labor, and transportation.

Reasonable care must be used to avoid hazards. Seller expressly disclaims responsibility for loss or damage caused by use of its Products other than in accordance with proper operating procedures. Except as stated herein, Seller makes no warranty, express or implied (either in fact or by operation of law), statutory or otherwise; and, except as stated herein, Seller shall have no liability under any warranty, express or implied (either in fact or by operation of law), statutory or otherwise. Statements made by any person, including representatives of Seller, which are inconsistent or in conflict with the terms of this warranty shall not be binding upon Seller unless reduced to writing and approved by an officer of Seller.

Warranty Replacement and Adjustment

All claims under warranty must be made promptly after occurrence of circumstances giving rise thereto, and must be received within the applicable warranty period by Seller or its authorized representative. Such claims should include the Product serial number, the date of shipment, and a full description of the circumstances giving rise to the claim. Before any Products are returned for repair and/or adjustment, written authorization from Seller or its authorized representative for the return and instructions as to how and where these Products should be returned must be obtained. Any Product returned to Seller for examination shall be prepaid via the means of transportation indicated as acceptable by Seller. Seller reserves the right to reject any warranty claim not promptly reported and any warranty claim on any item that has been altered or has been returned by non-acceptable means of transportation. When any Product is returned for examination and inspection, or for any other reason, Customer shall be responsible for all damage resulting from improper packing or handling, and for loss in transit, notwithstanding any defect or non-conformity in the Product. In all cases, Seller has the sole responsibility for determining the cause and nature of failure, and Seller’s determination with regard thereto shall be final.

If it is found that Seller’s Product has been returned without cause and is still serviceable, Customer will be notified and the Product returned at Customer’s expense; in addition, a charge for testing and examination may be made on Products so returned.

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Table of Contents

Preface .................................................................................................................................................. vii
  Hazard and Safety Information......................................................................................................... vii
  Description....................................................................................................................................... 1
  Specifications.................................................................................................................................... 1

Request for Return Health and Safety Certification

Sales and Service Offices
MBA-100 Metal Bayard-Alpert Ion Gauge

Preface

Hazard and Safety Information

This manual uses the following standard safety protocols:

**WARNING**  
The warning messages are for attracting the attention of the operator to a particular procedure or practice which, if not followed correctly, could lead to serious injury.

**CAUTION**  
The caution messages are displayed before procedures, which if not followed, could cause damage to the equipment.

**NOTE**  
The notes contain important information.

This product must only be operated and maintained by trained personnel.

Before operating or servicing equipment, read and thoroughly understand all operation/maintenance manuals provided by Agilent. Be aware of the hazards associated with this equipment, know how to recognize potentially hazardous conditions, and how to avoid them. Read carefully and strictly observe all cautions and warnings. The consequences of unskilled, improper, or careless operation of the equipment can be serious.

In addition, consult local, state, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to your nearest office.

*EN 55022 Class A Warning*

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is also likely to cause harmful radio communications interference in which case the user will be required to correct the interference at their own expense.

Installation Requirements

To maintain compliance with both FCC Part 15 rules and the European Union's EMI directives, the user must use a shielded cable constructed of a braided shield and metal or metalized plastic backshells directly connected to the cable shield at the 15 pos D-Sub connector of the Eyesys Mini-BA. The shield must be connected to ground at the user's equipment. Failure to install the equipment in this way may result in the unit no longer meeting the requirements for radiated emissions and susceptibility.

Contacting

In the United States, you can contact Agilent Customer Service at 1-800-882-7426. See the back cover of this manual for a listing of our sales and service offices.

Description

This small metal enclosed hot filament gauge is intended for use in applications where the applied vacuum is between ~30 mTorr to $5 \times 10^{-10}$ Torr (5 Pa and $5 \times 10^{-8}$ Pa). It employs a small diameter UHV style mesh grid and a single thoriated iridium filament. The construction is of all welded stainless steel with a glass sealed feedthrough enclosed in a plastic housing to protect users from accidental electrical shock and burns. The product features a locking type connector at the base and is available in a variety of flanges and fittings compatible with a 1" tabulation. It is compatible with Multi-Gauge (UHV Gauge Board p/n L8321301) and senTorr™ UHV versions. A special cable, p/n R1172-3XXX, is available in customer specified lengths up to 100’ (33 m).

Specifications

Table 1 Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Pressure Range    | Flange 30 mTorr to $5 \times 10^{-10}$ Torr  
                      5 Pa to $5 \times 10^{-8}$ Pa                                            |
| Sensitivity       | 15/Torr typical                                                              |
| Grid Voltage      | 180 to 200 VDC                                                              |
| Filament Bias     | 27 VDC                                                                      |
| Collector Bias    | 0 VDC                                                                       |
| Emission Current  | 1 mA max                                                                    |
| Filament Power    | ~3 W, varies with pressure (1.5 VDC @ 2 ADC typical at 1 mA emission current) |
| Degas             | E-Beam, 600 VDC @ 10 mA maximum                                             |
| Bake Out Temperature | 100°C maximum, cable disconnected, 80°C with cable                         |
| Materials         | ❑ Grid - 304 SST  
                      ❑ Fil - Thoriated Iridium  
                      ❑ Coll - Tungsten                                                         |
| Shell             | 304 SST                                                                    |
| Feedthrough       | 304 SST glass, nickel alloy pins                                             |
| Flanges           | 304 SST                                                                    |
| Shroud            | Glass-filled Minion                                                         |
For additional operating limitations, please refer to the appropriate controller operating manuals. The MBA-100 is compatible with the Agilent Multi-Gauge UHV Controller, senTorr” UHV Controller, and PanelVac UHV Controller.

### Table 1 Specifications (Continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>Series 2 Circular Plastic Connector, size 11-9 (glass filled nylon)</td>
</tr>
<tr>
<td>Cable</td>
<td>R1172-3XXX where XXX is the length in feet (5’ increments)</td>
</tr>
<tr>
<td></td>
<td>For example: R1172-310 is 10’</td>
</tr>
</tbody>
</table>
Dear Customer:

Please follow these instructions whenever one of our products needs to be returned.

1) Complete the attached Request for Return form and send it to Agilent Technologies (see below), taking particular care to identify all products that have pumped or been exposed to any toxic or hazardous materials.

2) After evaluating the information, Agilent Technologies will provide you with a Return Authorization (RA) number via email or fax, as requested.

   Note: Depending on the type of return, a Purchase Order may be required at the time the Request for Return is submitted. We will quote any necessary services (evaluation, repair, special cleaning, etc).

3) Important steps for the shipment of returning product:
   - Remove all accessories from the core product (e.g. inlet screens, vent valves).
   - Prior to shipment, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
   - If ordering an Advance Exchange product, please use the packaging from the Advance Exchange to return the defective product.
   - Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
   - Agilent Technologies is not responsible for returning customer provided packaging or containers.
   - Clearly label package with RA number. Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a RA clearly written on the outside cannot be accepted and will be returned.

4) Return only products for which the RA was issued.

5) Product being returned under a RA must be received within 15 business days.

6) Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information. Customer is responsible for freight charges on returning product.

7) Return shipments must comply with all applicable Shipping Regulations (IATA, DOT, etc.) and carrier requirements.

RETURN THE COMPLETED REQUEST FOR RETURN FORM TO YOUR NEAREST LOCATION:

EUROPE:  
Fax: 00 39 011 9979 330
Fax Free: 00 800 345 345 00
Toll Free: 00 800 234 234 00
vpt-customeercare@agilent.com

NORTH AMERICA:  
Fax: 1 781 860 9252
Fax Free: 800 882 7426, Option 3
Toll Free: 800 882 7426, Option 3
vpl-qa@agilent.com

PACIFIC RIM:  
please visit our website for individual office information
http://www.agilent.com
1) CUSTOMER INFORMATION

<table>
<thead>
<tr>
<th>Company Name:</th>
<th>Contact Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tel:</th>
<th>Email:</th>
<th>Fax:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer Ship To:</th>
<th>Customer Bill To:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Europe only: VAT reg. Number: USA/Canada only: ☐ Taxable ☐ Non-taxable

2) PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Agilent P/N</th>
<th>Agilent S/N</th>
<th>Original Purchasing Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) TYPE OF RETURN (Choose one from each row and supply Purchase Order if requesting a billable service)

3A. ☐ Non-Billable ☐ Billable ☑ New PO # (hard copy must be submitted with this form):

3B. ☐ Exchange ☐ Repair ☐ Upgrade ☐ Consignment/Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

4) HEALTH and SAFETY CERTIFICATION

AGILENT TECHNOLOGIES CANNOT ACCEPT ANY PRODUCTS CONTAMINATED WITH BIOLOGICAL OR EXPLOSIVE HAZARDS, RADIOACTIVE MATERIAL, OR MERCURY AT ITS FACILITY. Call Agilent Technologies to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):

☐ HAS NOT pumped or been exposed to any toxic or hazardous materials. OR
☐ HAS pumped or been exposed to the following toxic or hazardous materials. If this box is checked, the following information must also be filled out. Check boxes for all materials to which product(s) pumped or was exposed:

☐ Toxic ☐ Corrosive ☐ Reactive ☐ Flammable ☐ Explosive ☐ Biological ☐ Radioactive

List all toxic/hazardous materials. Include product name, chemical name, and chemical symbol or formula:

________________________________________________________________________________________________________

NOTE: If a product is received at Agilent which is contaminated with a toxic or hazardous material that was not disclosed, the customer will be held responsible for all costs incurred to ensure the safe handling of the product, and is liable for any harm or injury to Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Print Name: Authorized Signature: ……………………… Date:

5) FAILURE INFORMATION:

Failure Mode (REQUIRED FIELD. See next page for suggestions of failure terms):

Detailed Description of Malfunction: (Please provide the error message)

Application (system and model):

I understand and agree to the terms of Section 6, Page 3/3.

Print Name: Authorized Signature: ……………………… Date:
**Agilent Technologies**

**Vacuum Products Division**

**Request for Return Form**

*(Health and Safety Certification)*

Please use these Failure Mode to describe the concern about the product on Page 2.

<table>
<thead>
<tr>
<th>TURBO PUMPS and TURBO CONTROLLERS</th>
<th>POSITION</th>
<th>PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPARENT DEFECT/MALFUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Does not start</td>
<td>- Noise</td>
<td>- Vertical</td>
</tr>
<tr>
<td>- Does not spin freely</td>
<td>- Vibrations</td>
<td>- Horizontal</td>
</tr>
<tr>
<td>- Does not reach full speed</td>
<td>- Leak</td>
<td>- Upside-down</td>
</tr>
<tr>
<td>- Mechanical Contact</td>
<td>- Overtemperature</td>
<td>- Other:</td>
</tr>
<tr>
<td>- Cooling defective</td>
<td>- Clogging</td>
<td></td>
</tr>
</tbody>
</table>

|            | Power: | Rotational Speed: |
|            | Current: | Inlet Pressure: |
| Temp 1:   | Foreline Pressure: |
| Temp 2:   | Purge flow: |
| OPERATING TIME: | |

<table>
<thead>
<tr>
<th>ION PUMPS/CONTROLLERS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APPARENT DEFECT/MALFUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bad feedthrough</td>
<td>- Poor vacuum</td>
<td></td>
</tr>
<tr>
<td>- Vacuum leak</td>
<td>- High voltage problem</td>
<td></td>
</tr>
<tr>
<td>- Error code on display</td>
<td>- Other</td>
<td></td>
</tr>
</tbody>
</table>

|            | Main seal leak | Bellows leak |
|            | Solenoid failure | Damaged flange |
|            | Damaged sealing area | Other |

<table>
<thead>
<tr>
<th>LEAK DETECTORS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APPARENT DEFECT/MALFUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cannot calibrate</td>
<td>- No zero/high backround</td>
<td></td>
</tr>
<tr>
<td>- Vacuum system unstable</td>
<td>- Cannot reach test mode</td>
<td></td>
</tr>
<tr>
<td>- Failed to start</td>
<td>- Other</td>
<td></td>
</tr>
</tbody>
</table>

|            | Display problem |
|            | Communication failure | Degas not working |
|            | Error code on display | Other |

<table>
<thead>
<tr>
<th>SCROLL AND ROTARY VANE PUMPS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APPARENT DEFECT/MALFUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pump doesn’t start</td>
<td>- Noisy pump (describe)</td>
<td></td>
</tr>
<tr>
<td>- Doesn’t reach vacuum</td>
<td>- Over temperature</td>
<td></td>
</tr>
<tr>
<td>- Pump seized</td>
<td>- Other</td>
<td></td>
</tr>
</tbody>
</table>

|            | Heater failure | Electrical problem |
|            | Doesn’t reach vacuum | Cooling coil damage |
|            | Vacuum leak | Other |

<table>
<thead>
<tr>
<th>VALVES/COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent Defect/Malfunction</td>
</tr>
<tr>
<td>- Main seal leak</td>
</tr>
<tr>
<td>- Solenoid failure</td>
</tr>
<tr>
<td>- Damaged sealing area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Gauge tube not working</td>
</tr>
<tr>
<td>- Communication failure</td>
</tr>
<tr>
<td>- Error code on display</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIFFUSION PUMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent Defect/Malfunction</td>
</tr>
<tr>
<td>- Heater failure</td>
</tr>
<tr>
<td>- Doesn’t reach vacuum</td>
</tr>
<tr>
<td>- Vacuum leak</td>
</tr>
</tbody>
</table>

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**Section 6) ADDITIONAL TERMS**

Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.

- Customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable Shipping Regulations (IATA, DOT, etc.) and carrier requirements.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies within 15 business days. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- A Special Cleaning fee will apply to all exposed products per Section 4 of this document.
- If requesting a calibration service, units must be functionally capable of being calibrated.
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