



MA-1040

Magnetic Analyzer

Operator's Manual

V2.0

WARRANTY

Particulate Systems, a brand operating under MICROMERITICS INSTRUMENT CORPORATION, warrants for one year from the date of shipment each instrument it distributes to be free from defects in material and workmanship impairing its usefulness under normal use and service conditions except as noted herein.

Our liability under this warranty is limited to repair, servicing and adjustment, free of charge at our plant, of any instrument or defective parts when returned prepaid to us and which our examination discloses to have been defective. The purchaser is responsible for all transportation charges involving the shipment of materials for warranty repairs. Failure of any instrument or product due to operator error, improper installation, unauthorized repair or alteration, failure of utilities, or environmental contamination will not constitute a warranty claim. The materials of construction used in products distributed by MICROMERITICS under the Particulate Systems brand cannot be totally guaranteed against wear and/or decomposition by chemical action (corrosion) as a result of normal use.

Repair parts are warranted to be free from defects in material and workmanship for 90 days from the date of shipment.

No instrument or product shall be returned to MICROMERITICS prior to notification of alleged defect and authorization to return the instrument or product. All repairs or replacements are made subject to factory inspection of returned parts. MICROMERITICS shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own authorized service personnel unless such work is authorized in writing by MICROMERITICS.

The obligations of this warranty will be limited under the following conditions:

1. Certain products sold by MICROMERITICS are the products of reputable manufacturers, sold under their respective brand names or trade names. We, therefore, make no express or implied warranty as to such products. We shall use our best efforts to obtain from the manufacturer, in accordance with his customary practice, the repair or replacement of such of his products that may prove defective in workmanship or materials. Service charges made by such manufacturer are the responsibility of the ultimate purchaser. This states our entire liability in respect to such products, except as an authorized person of MICROMERITICS may otherwise agree to in writing.
2. If an instrument or product is found defective during the warranty period, replacement parts may, at the discretion of MICROMERITICS, be sent to be installed by the purchaser, e.g., printed circuit boards, check valves, seals, etc.
3. Expendable items, e.g., sample tubes, detector source lamps, indicator lamps, fuses, valve plugs (rotor) and stems, seals and O-rings, ferrules, etc., are excluded from this warranty except for manufacturing defects. Such items which perform satisfactorily during the first 45 days after the date of shipment are assumed to be free of manufacturing defects.

Purchaser agrees to hold MICROMERITICS harmless from any patent infringement action brought against MICROMERITICS if, at the request of the purchaser, MICROMERITICS modifies a standard product or manufactures a special product to the purchaser's specifications.

MICROMERITICS shall not be liable for consequential or other type damages resulting from the use of any of its products other than the liability stated above. This warranty is in lieu of all other warranties, express or implied, including, but not limited to, the implied warranties of merchantability or fitness for use.

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Introduction

This operator's manual provides a description, specifications, and operating instructions for the MA-1040 Magnetic Analyzer.

The following symbols are used to identify notes of importance and cautions.



Notes contain important information pertinent to the subject matter.



Cautions contain information to prevent damage to the analyzer or its components.

Description

The MA-1040 Magnetic Analyzer is designed to detect very low levels of magnetic materials. It is capable of measuring magnetic content down to 0.1 parts-per-million (ppm) resolution.

The MA-1040 is useful for detecting minute quantities of iron or other ferromagnetic elements in a wide range of materials such as high-purity glass used for fiber optics or plastics used in wiring insulation. The MA-1040 can also be used to detect low magnetic iron levels in food, precious gems, pharmaceuticals, and many other materials. The MA-1040 has been referenced in American National Standards Institute (ANSI) bulletins as well as bulletins for the Abrasive Grain Association.

All of the MA-1040 Magnetic Analyzer components are enclosed in a small cabinet. The controls are located on top of the enclosure for easy visibility and convenient access. The power switch and the serial port are mounted on the side.

Operation is simple and straight-forward. A sample, the weight of which has been entered, is lowered into the sample chamber and, within in seconds, a digital readout displays the results.

Components and Connectors

Top Panel



LCD Five-Digit Display

Displays readings of magnetic content in PPM

WEIGHT-GRAMS control

Used to enter the sample weight
Range: 000 - 999 grams

ZERO control

Used to zero the reading on the display when the sample chamber is empty

Sample Chamber

For inserting the sample holder or reference standard

Side Panel



Power connector

For connecting the power cord

On/Off switch

For turning the analyzer on and off

Specifications

| Characteristic | Specification |
|--------------------|---|
| Environment | |
| Temperature: | Stable between 10 and 45 °C (50 to 113 °F), operating; -10 and 55 °C (14 to 131 °F), non-operating |
| Physical | |
| Height: | 16.76 cm (6.6 in.) |
| Width: | 25.40 cm (10 in.) |
| Depth: | 13.34 cm (5.25 in.) |
| Weight: | 6.8 kg (15 lbs) |
| Electrical | |
| Voltage: | 95 - 250 VAC |
| Frequency: | 50 to 60 Hz |
| Sample | |
| Sample weight: | 000 - 999 grams |
| Magnetic content: | 0.1 ppm - 1999.9 ppm |

Setting up the Analyzer

For optimum performance from your MA-1040 analyzer, keep the following in mind when selecting a location for its placement:

- Avoid locations near strong magnetic fields, such as transformers or power lines carrying high currents.
- Avoid placing the analyzer on a steel table. If unavoidable, place a 3/4-in. thick piece of plywood underneath the instrument.
- Ensure a constant room temperature; fluctuations may result in inaccurate readings.

1. Place the analyzer (display side up) on a workbench or table.



Remember to place a 3/4-in. piece of plywood under the analyzer if a steel table is used.

2. Insert the 8-pin connector end of the power cord into the power connector on the side of the analyzer and the other end into an appropriate power source.
3. Turn on the analyzer; allow 30 minutes for warm-up.

Reference Standard Test

A Reference Standard is provided to ensure that calibration of the MA1040 is accurate based on the original specifications.



It is recommended that a reference standard test be performed at the beginning of each work day when using the analyzer on a daily basis.

1. With the sample chamber empty, set the **WEIGHT-GRAMS** control to 100 grams and adjust the **ZERO** control to 000.0.
2. Place the reference standard in the sample chamber. Within two to three seconds, a reading is displayed; ignore this first reading.



It is important that the temperature for the reference standard and analyzer be the same. Otherwise, the reading may drift quickly and skew the reading. If this occurs, allow the standard to remain in the chamber to equilibrate to the temperature of the analyzer (approximately 5 - 10 minutes) before proceeding.

3. Remove the reference standard from the sample chamber, then reinsert it; a reading is displayed within two to three seconds. Make a note of this reading.
4. Repeat Step 3 two more times, making a note of each reading.
5. Take an average of the three readings (from steps 3 and 4). The average for the three readings should be within 1% of the value printed on the reference standard, or ± 0.5 PPM, whichever is greater. If the reading is outside of this range, contact Particulate Systems for assistance.
6. Remove the reference standard.



When not in use, do not store the reference standard in the sample chamber.

Cleaning the Sample Holder

Sample holders should always be clean and dry before adding sample. Use a mild soap and water to clean the sample holder; a soft-bristled brush may also be used.



Do not use steel brushes or harsh solvents (such as acetone) to clean the sample holder. Doing so will scratch the inside of the sample holder.

Weighing the Sample

Perform the following steps to obtain the sample weight:

1. Place a clean, dry sample holder on the balance. Allow the balance to stabilize then tare it to zero.
2. Using a proper lab technique (such as stirring), mix the sample to evenly distribute all grains.



Be sure to mix the sample well so that grains are distributed evenly. Settling of the sample will result in an inaccurate reading.

3. Remove the sample holder from the balance and fill with sample until it is just below the over-fill orifice.
4. Place the sample holder (containing sample) back onto the balance. Allow the balance to stabilize and record the weight shown on the display.

Performing the Analysis

After your sample has been weighed and the weight recorded, you can start the analysis.

1. With the sample chamber empty, adjust the ZERO control to 000.0.
2. Adjust the WEIGHT-GRAMS control to the recorded weight of the sample.
3. Insert the sample holder containing the sample into the sample chamber.



Within a few seconds, the relative percentage of magnetic material in the sample is displayed; record this value. The displayed value is accurate for about three to five seconds, after which time the display may drift.

4. Remove and empty the sample holder. Place the empty sample holder back into the sample chamber and record the reading shown on the display. Subtract this value from the reading obtained when the sample holder contained sample (step 3). This is the actual percentage (in ppm) of magnetic material contained in the sample.



Because the empty sample holder reading is usually negative, the true reading is obtained by simply adding the absolute value of the empty sample holder reading to the reading of the holder with sample (step 3).

5. Remove the sample holder from the sample chamber.



When not in use, do not store the sample holder in the sample chamber.

Ordering Information

Components for the MA-1040 analyzer can be ordered using one of the following methods:

- Call Customer Service at (770) 662-3636
- Access the Micromeritics web site at www.micromeritics.com
- Contact your local sales representative

When ordering, please use the information provided below to place your order.

| Part Number | Item and Description |
|----------------|------------------------------|
| P03-25803-00 | Sample holder |
| P03-34810-0010 | Reference standard, 10 PPM |
| P03-34810-0050 | Reference standard, 50 PPM |
| P03-34810-0100 | Reference standard, 100 PPM |
| P03-34810-0500 | Reference standard, 500 PPM |
| P03-34810-0700 | Reference standard, 700 PPM |
| P03-34810-1000 | Reference standard, 1000 PPM |
| P03-34810-1200 | Reference standard, 1200 PPM |
| P03-34810-700 | Reference standard, 1700 PPM |
| P03-34810-2000 | Reference standard, 2000 PPM |
| P03-34810-2500 | Reference standard, 2500 PPM |
| P03-34810-4000 | Reference standard, 4000 PPM |
| P03-34810-5000 | Reference standard, 5000 PPM |

