

# MDX Series



Model  
**MDX-602**

DEF / Battery Refractometer

## USER GUIDE



### Included Parts



1. MDX-Series Digital Refractometer
2. Removable Rubber Grip
3. Removable Prism Cover
4. Disposable Pipet
5. AAA, 1.5V Battery (1ea.)
6. Hardshell Storage Case
7. Screwdriver (not shown)

### Instrument Use

#### Power On and Calibration

One press of the power key will power on the instrument (figure 6). In order to maximize battery life the refractometer is designed to shut itself off after 1 minute of inactivity.

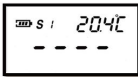


figure 6

A zero calibration should be performed daily to achieve optimal accuracy.

- Clean and dry the sample well. Place a 4-5 drops of clean, distilled water in the sample well.
- Close the prism cover to prevent stray light from affecting the calibration.
- Press and hold the ZERO key for two seconds until "CAL" is displayed, then release (figure 7).
- "CAL" will flash repeatedly for 10 seconds. Press ZERO once again while "CAL" flashes to perform the calibration. During this time it is crucial to not open the prism cover.
- If ZERO is not pressed again then the calibration will not be performed.
- The display will indicate "END" when finished calibrating (figure 8).

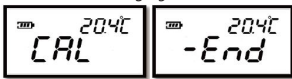


figure 7

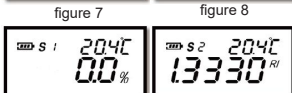


figure 8



figure 9

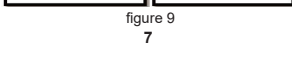


figure 10

figure 11

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### Introduction

The VEE GEE MDX-Series portable digital refractometers are a modern design utilizing advanced opto-electronic components to provide years of fast, accurate liquid testing with high reproducibility.

The MDX-Series models are designed to be simple to use with little training necessary, regardless though, it's highly recommended that users read this User Guide in its entirety before using the instrument for the first time.

At any point if you have any questions please contact our support team at:

### Warranty

VEE GEE digital refractometers are warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. During this period the VEE GEE Service Center will, at their option and without charge, either repair or replace any part found to be defective in materials and workmanship.

All warranty work shall be performed by the VEE GEE Service Center. Contact your dealer or the VEE GEE Service Center for troubleshooting the issue and to receive a Return Authorization, if necessary, for the return of your instrument for repair. The party returning the product must prepay all postage, shipping, transportation, packaging, duties & taxes, and delivery costs to the VEE GEE Service Center.

This warranty is subject to the following limitations and will not apply if:

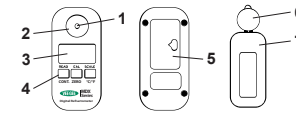
- 1) There is lack of proof of purchase date and place of purchase. The warranty is not assignable or transferable.
- 2) The damage is due to normal wear (including the prism), misuse, abuse, negligence, or any other cause not due to manufacturing of the product.
- 3) The serial number is altered or obliterated; or unauthorized repair or replacement of parts by any party other than the VEE GEE Service Center.

This warranty expressly excludes transportation damage and readjustment. In no case shall VEE GEE Scientific LLC be liable to the Buyer or any person for any special, indirect, incidental, or consequential damage whether claims are based in contract or otherwise with respect to or arising out of product furnished hereunder. For goods manufactured by any third party, VEE GEE Scientific's liability under warranty is limited to the terms of the warranty by the supplier of the goods.

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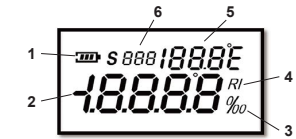
### VEE GEE MDX-Series

#### Instrument Components



1. Prism Surface
2. Sample Well
3. LCD Display
4. Control Keys
5. Battery Compartment Cover
6. Removable Prism Cover
7. Removable Rubber Grip

#### Instrument Display



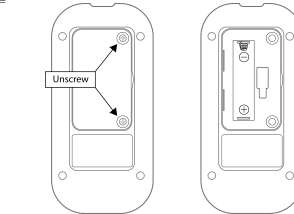
1. Battery Level Indicator
2. Reading Display
3. Percent or Per mille Scale Indicator
4. Refractive Index Scale Indicator
5. Temperature Display (°C or °F)
6. Active Scale Indicator / Continuous Read Timer

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Battery Level	Display Indicator
100-80%	
80-50%	
50-20%	
<20%	

Expected battery life: 1000+ reads

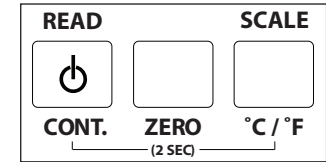
#### Battery Compartment



- Unscrew the two screws to open the battery compartment.
- Place AAA, 1.5V (1ea.) battery into the battery slot. Pay careful attention to ensure proper battery polarity when inserting.

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### Control Keys



#### READ | Power On | CONT.

- Press once and release to power on.
- Press once and release while powered on to take reading.
- Press and hold for 2 seconds while powered on to initiate continuous read loop function.

#### ZERO

- Press and hold for 2 seconds then press once again within 10 seconds to perform zero calibration procedure.

#### SCALE | °C / °F

- Repeatedly press and release to toggle through all available scales.
- Press and hold for 2 seconds to toggle between °C and °F temperature display.

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### Continuous Loop Readings:

Pressing and holding the READ key for 2 seconds will start the continuous loop function. In this mode the refractometer will make 15 sequential reads spaced about 1 second apart, then display an average of all readings as the last reading. During this function the scale indicator will change to a counter and count down from 15 with each read (figure 11).

### Troubleshooting

If unexpected results are experienced while testing your samples:

- Ensure that you are closing the prism cover when taking readings and during calibration.
- Recalibrate with clean, fresh distilled water and be sure that you are pressing the ZERO key once again while CAL is flashing on display.
- Replace the battery with a new AAA 1.5V battery.
- Fully clean the sample well and prism.
- Ensure that you are working with highly homogenous samples and that it is free of large particulate matter; filter if necessary.
- Keep in mind that as a sample sits in the sample well, suspended solids may settle to the bottom and affect the readings.
- When testing samples that are of a different temperature than the instrument and/or environment it is best to wait a few seconds before pressing the READ key to allow the sample to acclimate properly.

### Care and Cleaning

- It is important to clean the sample well completely when finished using and between samples to prevent solids from building up on the prism and causing erroneous readings.
- Use distilled water or diluted isopropanol with a soft cloth or tissue to clean the prism surface and sample well.
- Use a mild detergent to clean the instrument body; solvents are not recommended.
- When testing corrosive or acidic samples it is crucial to completely clean the sample well and prism between each reading and be careful to not get any of the sample on the plastic instrument housing.

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### Error Codes



figure 12



figure 13



figure 14

Error Code	Description
A01	Calibration Temperature Error: Operating temperature must be 0-40°C. (figure 12)
A02	Calibration Sample Error: Use clean distilled water only for zero calibration.
A03	Hardware Failure: Contact our Technical Support department.
HHH / LLL (sample)	Sample High/Low Value Error: Sample above or below measurable range. (figure 13)
HHH / LLL (temperature)	Temperature High/Low Value Error: Environment above or below acceptable range. (figure 14)

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Model	MDX-602
Catalog Number	48602
Scale 1 Range	0.0 - 51.0% DEF (Urea)
Scale 1 Resolution	0.1% DEF
Scale 1 Accuracy	±0.2% DEF
Scale 2 Range	1.3330 - 1.4200 nD
Scale 2 Resolution	0.0001 nD
Scale 2 Accuracy	±0.0003 nD
Scale 3 Range	1.000 - 1.500 s.g.
Scale 3 Resolution	0.001 s.g.
Scale 3 Accuracy	±0.005 s.g.

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Model	MDX-602
ATC Range	0-40°C 32-104°F
IP Rating	IP67: detecting unit IP65: body
Wavelength	589.3nm LED
Sample Cell	Stainless Steel
Calibration Solution	Distilled Water
Min. Sample Volume	0.3mL
Battery	1 X AAA, 1.5V
Dimensions	121 x 58 x 25mm
Weight	90g
Warranty	1-Yr Parts & Labor

