

## Atago ATA-2351

# Atago MASTER-53 $\alpha$ Hand-Held Refractometer User Manual

Model: ATA-2351

## INTRODUCTION

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The Atago 2351 MASTER-53 $\alpha$  (alpha) is a robust, hand-held, and portable refractometer designed for precise Brix measurements. It features automatic temperature compensation (ATC) and is housed in an Ingress-Protection (IP)-65 rated metal body, ensuring durability and water resistance. This manual provides essential information for the proper setup, operation, and maintenance of your MASTER-53 $\alpha$  refractometer.



Figure 1: Atago MASTER-53α Hand-Held Refractometer. This image shows the compact, elongated design of the refractometer, highlighting its prism end for sample application and the eyepiece for reading measurements. The Atago brand name and "AUTOMATIC & WATER RESISTANT" text are visible on the body.

## PACKAGE CONTENTS

Upon opening the package, verify that all components are present and undamaged:

- 1 x Atago 2351 MASTER-53α Refractometer
- 1 x Calibration Screwdriver
- 1 x Protective Plastic Storage Case
- 1 x Instruction Manual (this document)

## SETUP

### Initial Inspection

Before first use, carefully inspect the refractometer for any signs of damage that may have occurred during shipping. Ensure the prism surface is clean and free of dust or debris.

## Calibration

The MASTER-53 $\alpha$  features Automatic Temperature Compensation (ATC), which adjusts readings for ambient temperature variations. However, periodic calibration is essential for accuracy.

1. Ensure the prism surface is clean and dry.
2. Apply a few drops of distilled water onto the prism.
3. Close the daylight plate gently.
4. Look through the eyepiece and observe the boundary line.
5. Using the provided calibration screwdriver (or a suitable alternative), turn the calibration screw until the boundary line aligns precisely with the "0" mark on the Brix scale.
6. Clean the prism thoroughly after calibration.

*Note: The unit retains its water-resistance even when the calibration screw is adjusted.*

## OPERATING INSTRUCTIONS

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### Sample Preparation

Ensure your sample is well-mixed and free of solid particles that could interfere with the reading or damage the prism.

### Measurement Procedure

1. Ensure the prism and daylight plate are clean and dry.
2. Using the spoon-shaped tip, apply a small volume (approximately 10 $\mu$ l or more) of the sample onto the main prism surface. The spoon-shaped tip facilitates automatic sample distribution (ASD).
3. Gently close the daylight plate over the sample, ensuring no air bubbles are trapped. The sample should spread evenly across the prism.
4. Point the refractometer towards a light source (ambient light is sufficient; no external power source is required).
5. Look through the monocular, focusable, cushioned eyepiece.
6. Adjust the focus of the eyepiece until the scale and boundary line are clear.
7. Read the value where the boundary line intersects the Brix scale. The bright, high-contrast display ensures clear visibility.

### Understanding Readings

The Brix scale indicates the sugar concentration in percent by weight (% Brix). Due to the Automatic Temperature Compensation (ATC) feature, the displayed reading is automatically corrected for temperatures between 10°C and 30°C, providing accurate results without manual temperature adjustments.

## MAINTENANCE

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### Cleaning

Regular cleaning is crucial for maintaining accuracy and hygiene. The MASTER-53 $\alpha$  is IP-65 rated (excluding the eyepiece), meaning it is dust-tight and protected against water jets. This allows for easy cleaning:

- After each use, clean the prism and daylight plate immediately with a soft, damp cloth or tissue.
- For thorough cleaning, the unit can be rinsed under running water from a faucet. Ensure no water enters the eyepiece.
- Avoid using abrasive materials or harsh solvents, as these can damage the prism or body.
- The smooth outer shell grip is designed to be easy to clean, reducing the possibility of food and sample entrapment and preventing bacterial growth.

- Dry all parts thoroughly before storage.

## Storage

When not in use, store the refractometer in its protective plastic storage case. The foam cut-out insert provides cushioning and protects the instrument from physical damage and environmental factors. Store in a cool, dry place away from direct sunlight and extreme temperatures.

## TROUBLESHOOTING

This section addresses common issues you might encounter with your refractometer.

Problem	Possible Cause	Solution
Inaccurate or inconsistent readings	Prism or daylight plate is dirty. Improper calibration. Insufficient sample volume. Air bubbles in the sample. Sample temperature outside ATC range (10-30°C).	Clean prism and daylight plate thoroughly. Recalibrate the instrument with distilled water. Ensure at least 10µl of sample is used. Reapply sample, ensuring no air bubbles. Allow sample to reach ambient temperature within the ATC range.
Boundary line unclear or fuzzy	Eyepiece out of focus. Insufficient light. Prism or daylight plate is dirty.	Adjust the eyepiece focus. Point the refractometer towards a brighter light source. Clean prism and daylight plate.
Scale not visible	Insufficient light. Eyepiece out of focus.	Point the refractometer towards a brighter light source. Adjust the eyepiece focus.

## SPECIFICATIONS

Parameter	Value
Measurement Scale Range	Brix 0.0 to 53.0% (with ATC)
Minimum Detection Scale	Brix 0.5%
Accuracy	Brix $\pm$ 0.5% at 10 to 30°C
Resolution	Brix $\pm$ 0.25%
Sample Volume	10µl or more
Ingress Protection (IP) Rating	IP-65 (dust-tight and protected against water jets, except eyepiece)
Illumination	Ambient light (no additional power source required)
Dimensions (H x W x D)	20.3 x 3.2 x 3.4 cm (8.0 x 1.3 x 1.3 inches)
Weight	130g (4.6 ounces)
Model Number	ATA-2351

## WARRANTY INFORMATION

The Atago MASTER-53 $\alpha$  Refractometer comes with a **Limited One-Year Warranty** from the date of purchase. This warranty covers defects in materials and workmanship under normal use. It does not cover damage resulting from misuse, accident, unauthorized modification, or improper maintenance. Please retain your proof of purchase for warranty claims.

## CUSTOMER SUPPORT

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For technical assistance, troubleshooting beyond this manual, or warranty inquiries, please contact Atago customer support. Refer to the official Atago website or your purchase documentation for the most current contact information.

When contacting support, please have your model number (ATA-2351) and purchase date readily available.

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