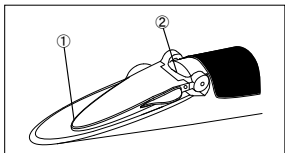


7. Quick and Easy sampling

Place approximately 0.3mL of sample on the front end (Figure ①) or the rear end (Figure ②) of the sample stage, and tilt the refractometer slightly in the proper direction to allow the sample to move over the prism. The sample liquid will spread evenly and the measurement value can then be read more quickly and easily. By eliminating the steps of lifting and closing the daylight plate when applying a sample, the operator can save much time when having to measure many samples daily. (This measuring method requires the sample to be low in viscosity.)



8. Brix Scale

All refractometers are designed to measure the refractive index of a solution. The Brix scale is based on a sucrose (sugar) and water solution. However, since most samples contain substances other than sugar - such as salts, minerals and proteins - the Brix percentage represents the total concentration of all soluble solids in the sample. For certain samples, such as cutting oils and other industrial fluids, a conversion chart from the Brix percentage to the sample's total concentration may be necessary.

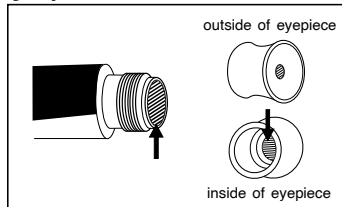
Note: A brix value expressed as a percentage (%) is equivalent to that value expressed in degrees Brix (° Brix).

9. When moisture accumulates in the eyepiece

If the view of the scale and boundary line becomes obstructed by moisture within the eyepiece, follow the instructions below for proper cleaning:

- ① While holding the eyepiece toward you, turn the eyepiece counter-clockwise until it can be removed.
- ② Gently wipe the two areas indicated by the arrows in the figure with a clean, dry cloth to remove any moisture.
- ③ Replace the eyepiece and secure by turning in a clockwise direction.

※MASTER-α series are water-resistant rated (JIS-C0920 5th grade jet proof type, IEC specification 529, IP65), however the eyepiece section is not water-resistant.



10. Repair and warranty

The MASTER-α series are warranted for one year after the date of purchase against any manufacturer defect in materials or workmanship. Prism and sample stage are excluded from the warranty. Any of the following events happening to the unit will void the warranty:

- Disassembled by anyone other than authorized service provider
- Immersed in liquid or dropped
- Misused, abused, or used/stored in improper ambient conditions

Service fees are applicable for repairs after the warranty period expires. Contact an authorized ATAGO Service Center or the original seller for details.

Have the serial number of your refractometer available when asking about repair.

11. Specifications

	MASTER-53 α (Cat.No.2351)	MASTER-10 α (Cat.No.2371)	MASTER-20 α (Cat.No.2381)	MASTER-α (Cat.No.2311)
Measurement range	Brix 0.0 to 53.0%	Brix 0.0 to 10.0%	Brix 0.0 to 20.0%	Brix 0.0 to 33.0%
	(Automatic Temperature Compensation)			
Minimum scale	Brix 0.2%	Brix 0.1%	Brix 0.1%	Brix 0.2%
Accuracy	Brix ±0.2% (at 20°C)	Brix ±0.2% (10 to 30°C)	Brix ±0.2% (10 to 30°C)	Brix ±0.2% (10 to 30°C)
Repeatability	Brix ±0.1% (at 20°C)	Brix ±0.1%	Brix ±0.1%	Brix ±0.1%
International Protection class	IP65 Water Resistant (except eyepiece)			
Size and weight	3.2 × 3.4 × 16.8cm, 130g	3.2 × 3.4 × 20.3cm, 155g	3.2 × 3.4 × 20.7cm, 165g	3.2 × 3.4 × 20.3cm, 155g

Design Registration No.000379326-0001, 000379326-0002 (EU), ZL 2005 3 0116403.4,5 (China), D111526 (Taiwan), D554, 549 (U.S.A.) 1255763, 1255764, 1255765, 1255766, 1255767 (Japan) Patent Granted in countries around the world.

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1910K Printed in Japan

In just-a-minute

From 1 year to 2 years Free Extended Warranty

2351-E07

It requires only 1 minute! Simply by answering questions, warranty period is extended from 1 year to 2 years.
(The registration page can be accessed from ATAGO website.)

Access now →



MASTER SERIES REFRACTOMETER
(Water Resistant & Automatic
Temperature Compensation)

MASTER-α series

INSTRUCTION
MANUAL

MASTER-53 α (Cat.No. 2351, Brix 0.0 to 53.0%)

MASTER-20 α (Cat.No. 2381, Brix 0.0 to 20.0%)

MASTER-10 α (Cat.No. 2371, Brix 0.0 to 10.0%)

MASTER-α (Cat.No. 2311, Brix 0.0 to 33.0%)

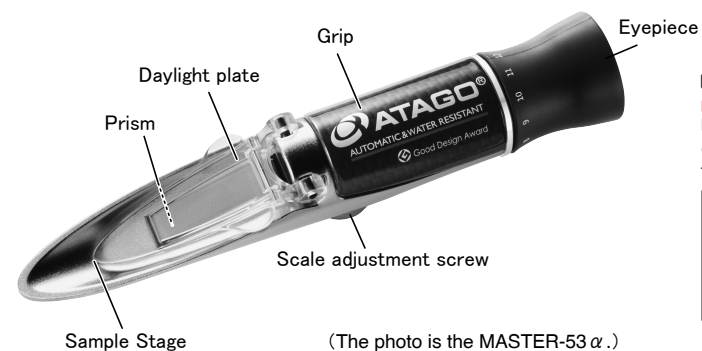


To ensure your refractometer continues to operate properly and look new for a long time!
When measuring samples with a high salt content, be sure to clean the refractometer by wiping the unit completely after each use, especially the metal areas. The unit should be stored in the ATAGO storage box provided when not in use.

Thank you for your purchase of a quality ATAGO product.

光... Capture the Light, Measure the Future!

1. Names and functions of main parts



Memo The eyepiece and daylight plate are user replaceable. Please contact an ATAGO distributor to place an order or for any inquiries.

Name	Part #
Eyepiece	RE-2311-12M
Daylight plate	RE-2315-60M
Small volume daylight plate	RE-2311-67M

ATAGO instruments are rigorously inspected to ensure each unit meets the highest standards of quality assurance.

PRECAUTIONS

(Be sure to read the following before use.)

Warning!

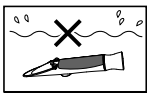
When using this instrument to measure solutions which may be harmful to humans, please handle all materials carefully, using the proper gloves and mask. Please be aware of any special handling instructions for any harmful solution.

Caution

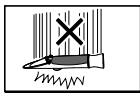
- Carefully read the instruction manual of this instrument to ensure proper use and operating methods.
- When handling and carrying this instrument, avoid dropping or subjecting to any strong shock or excessive force.
- If this instrument is used for any application other than its intended purpose, ATAGO will not be held liable for any damage caused by the use of or the measurement(s) obtained by the operator.
- ATAGO is not liable for any loss and damage caused by the measurement and use of this instrument.
- The prism is considered a consumable item and a charge will be incurred for the replacement of this part.
- All instruments received for repair are subject to a possible inspection fee. ATAGO does not warrant the problems which are caused by user's fault even though the unit is under warranty.

2. Precautions

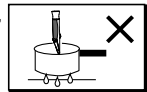
● Do not submerge the unit underwater for a prolonged period of time.



● The refractometer is a precise and sensitive optical instrument. Do not drop or subject to strong shock or excessive force.



● Do not submerge the unit in a hot liquid, such as a soup simmering in a pot.



● Store the unit in its original storage case in a dry, room temperature (0-40 °C) environment away from direct sunlight.



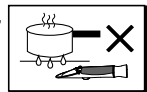
● When measuring a hot sample, the sample should be allowed to cool down to room temperature before being placed on the prism. By following this procedure the integrity of the prism will not deteriorate as quickly if used to measure hot samples continually.



● When measuring a murky or dark solution, the boundary line may be difficult to make out or completely invisible. Hold the unit up to stronger light, such as direct sunlight or a light source for microscopes.



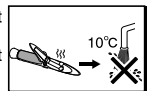
● Keep the unit away from any heat source, such as a cook stove.



● The prism and daylight plate should be completely clean for each measurement. Oil-based solutions may leave a film-like residue. Clean the prism and daylight plate with alcohol or mild detergent diluted with water.

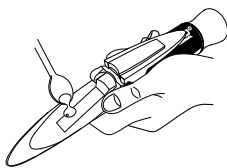


● Use water at ambient temperature (about 20°C) to clean the prism area after measuring a high-temperature solution. Do not use cold water (below 10°C).



3. Measurement

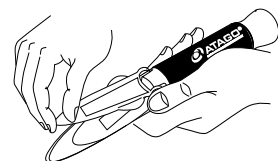
1



Put one or two drops of sample on the prism.

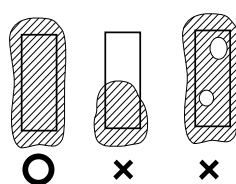
*Hold the refractometer between your fingers. Do not wrap your hand around the grip.

2



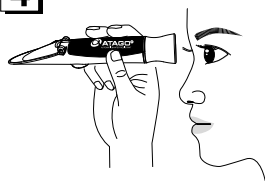
Close the daylight plate gently.

3



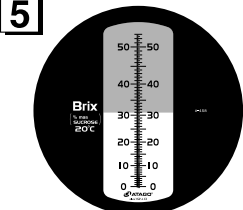
The sample must spread evenly over the prism surface. Air bubbles should be eliminated.

4



View the scale through the eyepiece. To focus, turn eyepiece in either direction until clear. Use the number printed on the side of the eyepiece as a reference for the position of the eyepiece when it is in focus.

5

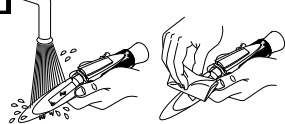


Read the measurement value where the boundary line intersects the scale.

*MASTER-53 α scale uses 0.2% increments on the left, and 0.5% increments on the right.

(MASTER-53 α pictured above.)

6



Wipe the sample off with a wet tissue or wash the prism with water.

After washing the prism, wipe off any remaining water with a dry soft tissue.

*Although the unit is rated IP65 dust-tight and resistant against water jets, it may be damaged from moisture penetration if left wet for extended periods of time.

The MASTER-H series is the heat-resistant model of the MASTER series. They are equipped with corrosion-resistant tempered glass prism and designed to withstand high-temperature samples. The conventional H-50, H-80, and H-93 refractometers are recommended for measuring jams during the cooking process.

4. Automatic Temperature Compensation (ATC)

With each sample, the refractive index varies depending on the temperature. The position of the boundary line, seen through the eyepiece, will deviate based on the temperature at the time of measurement. With a non-ATC Hand-held Refractometer, manual calculation for temperature correction is needed. For example, at 10°C intervals, a variation of 0.6 to 0.8% can be seen for a standard sugar solution at 10%.

The MASTER- α utilizes a built in Automatic Temperature Compensation feature so that the instrument's internal scale will shift automatically when the ambient temperature changes. This feature eliminates the need for temperature compensation charts. The refractometer and the sample should be at the same ambient temperature to ensure that the ATC feature is working correctly.

To measure a heated or refrigerated sample, allow the sample to conform to the ambient temperature before taking measurements. Waiting 1 to 2 minutes after putting the sample onto the prism will ensure more accurate readings.

5. Verifying Calibration and Calibration Certification

[1] Verifying Calibration

Periodic maintenance/service and calibration of your refractometer is recommended. The frequency at which calibration is performed will depend on each company's Standard Operating Procedures.

① Confirm that the prism is clean and free of scratches.

② Measure purified water or a sucrose solution. Check that the boundary line is parallel to the memory lines.

③ Verify that the measurement value is within $\pm 0.2\%$ of the expected value of the purified water (0.0%) or sucrose solution.

*Measure at an ambient temperature of 20°C.

Part No.	Part Name
RE-110010	Sucrose Solution 10.0%(g/100g)
RE-110020	Sucrose Solution 20.0%(g/100g)
RE-110030	Sucrose Solution 30.0%(g/100g)
RE-110040	Sucrose Solution 40.0%(g/100g)
RE-110050	Sucrose Solution 50.0%(g/100g)

When the measurement value falls outside of the expected range, verify calibration according to section 6. Calibration.

[2] Calibration Certification

Based on ISO quality management system, Calibration Certificates can be ordered for any ATAGO refractometer. HACCP or GMP certification can also be provided at additional cost. Please contact an ATAGO distributor for more information.

6. Calibration

If the measurement value is incorrect after verifying calibration (section 5.) adjust the scale at an ambient temperature of 20°C. Put purified water on the prism, then view the scale through the eye piece. To adjust the scale during calibration, turn the scale adjustment screw located on the underside as shown in the figure to the right.

