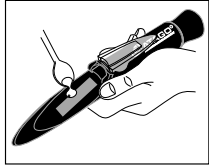


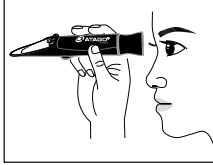
MASTER-5280

INSTRUCTION MANUAL

3 Easy Steps to Measure



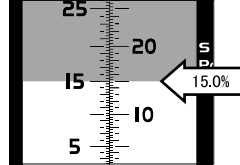
1. Apply the sample.



2. Close the daylight plate and view the scale through the eyepiece.

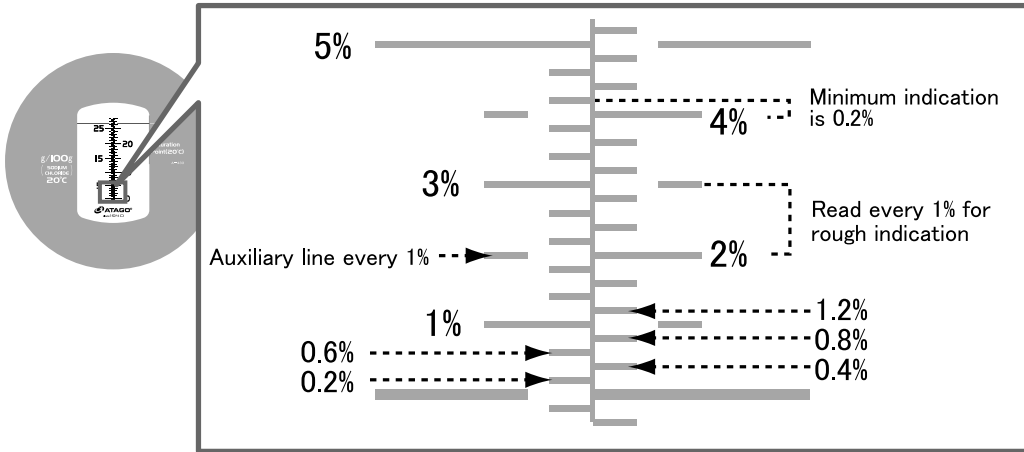
To focus, turn eyepiece in either direction until clear.

Use the number printed on the side of the eyepiece as a reference for the position of the eyepiece when it is in focus.



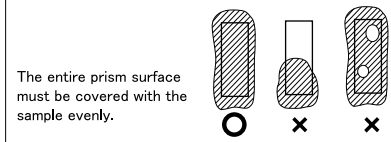
3. Read the value.

Scale Reading



Measurement Guideline

- Hold the refractometer between your fingers. Do not wrap your hand around the grip.
- The entire prism surface must be covered with the sample evenly. Air bubbles should be eliminated (right figure).



Cleaning

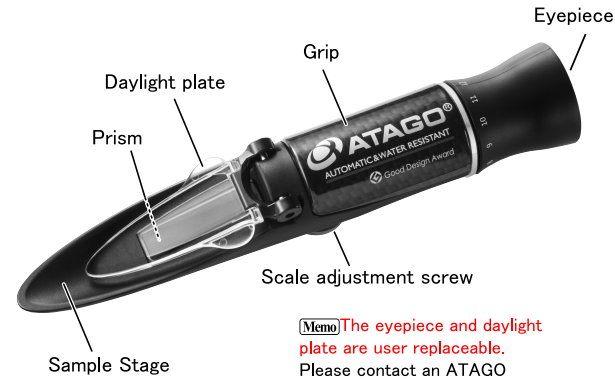
Wipe the sample off with a wet tissue or wash the prism with water. After washing the prism, wipe off any remaining water with a dry soft tissue. Oil-based solutions may leave a film-like residue. Clean the prism and daylight plate with alcohol or mild detergent diluted with water.

Note Wipe the prism gently so as not to scratch it.

Note 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.



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-2315-61M



Compact Redesign of the MASTER Series from October 2014.

To all customers using our previous model of the MASTER Series:

The MASTER series has been improved with a clearer, brighter field of view and made even easier to carry. These improvements in our newly compact redesigned models are especially clear when taking measurements in dim lighting, or measuring darkly-colored samples. Even when measuring milky-colored, opaque, or oily samples, the boundary line remains crisp and clear.

Note: The size of the scale has changed. It may take some time to re-adjust to the new field of view when reading measurements.

Try out our new MASTER units and see for yourself!

About the measuring

The instrument is refractometer which is designed to measure Salt Concentration (g/100g), so you get exact Salt Concentration % only the sample contains mostly salt. However, the refractometer reads total dissolved solids in the sample, so when sample contains some other substances such as sugar, protein, acid, and alcohol, also affected to the readings. Please ensure that the measuring sample contains mostly salt with no other substances to get exact Salt Concentration (g/100g).

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. The instrument 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 20 seconds after putting the sample onto the prism will ensure more accurate readings.

Before using the instrument, read "PRECAUTIONS" on the reverse side.

PRECAUTIONS (Be sure to read the following before use.)

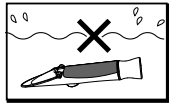
⚠ WARNING!

- 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.

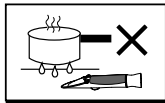
⚠ CAUTION

- 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 it 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 error even though the instrument is under warranty.

Precautions



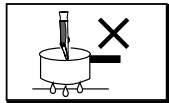
Do not submerge the unit underwater for a prolonged period of time.



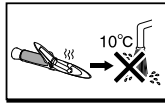
Keep the instrument away from any heat source, such as a cook stove.



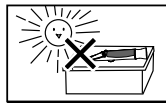
The refractometer is a precise and sensitive optical instrument. Do not drop or subject it to strong shock or excessive force.



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



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).



Store the instrument in its original storage case in a dry, room temperature (0 to 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.

Measurement Tips

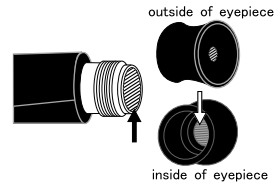
<When measuring a murky or dark solution>

The boundary line may be difficult to make out or completely invisible. Hold the instrument up to stronger light, such as direct sunlight or a light source for microscopes.

<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:

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

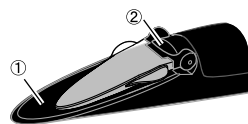


Note The instrument is water-resistant rated (JIS-C0920 5th grade jet proof type, IEC specification 529, IP65), however the eyepiece section is not water-resistant.

Quick and Easy Sampling

Automatic Sample Distribution (ASD) : 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.)



Calibration Verification and Certificate

<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.

- Confirm that the prism is clean and free of scratches.
- Use distilled water or a NaCl solution. Check that the boundary line is parallel to the memory lines.
- Verify that the measurement value matches the concentration of the NaCl solution used.

*Please contact an ATAGO distributor to order NaCl solutions.

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

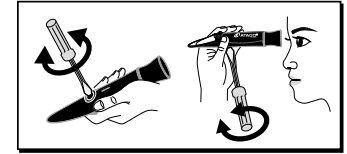
<Calibration Certificate>

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.

Calibration

If the measurement value is incorrect after "Verifying Calibration" (Calibration Verification and Certificate) adjust the scale at an ambient temperature of 20°C. To adjust the scale during calibration, turn the scale adjustment screw located on the underside as shown in the figure to the right.

Note Don't turn the scale adjustment screw excessively, otherwise, it may cause the refractometer to malfunction. All ATAGO Hand-held Refractometers are delivered after being adjusted in ATAGO factory.



Repair and Warranty

The instrument is 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.

Specifications

	MASTER-S28α (Cat.No.2481)
Measurement range	Sodium chloride 0.0 to 28.0g/100g (Automatic Temperature Compensation)
Minimum scale	Sodium chloride 0.2g/100g
Accuracy	Sodium chloride ±0.2g/100g (10 to 30°C)
International Protection class	IP65 Water Resistant (except eyepiece)
Size and weight	3.2 × 3.4 × 16.8cm, 90g

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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