5010-E11

ATAGO®

How to Get Extended warranty 1 year → 2 years

The warranty period will be extended from 1 year to 2 years
when you register your information.

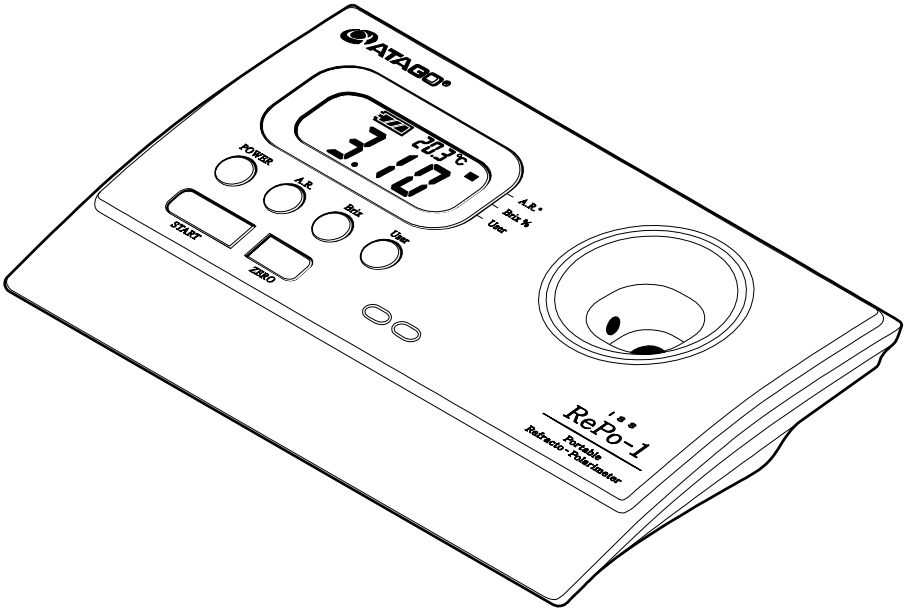
Trouble scanning the code? Access this link https://www.atago.net/ur/index.php?l=en

QR code

Portable Refracto-Polarimeter

RePo-1

Instruction Manual
Cat. No. 5010

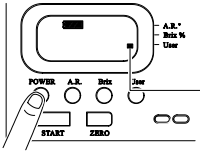


Quick Manual

1 **Powering on**

(☞ page 4)

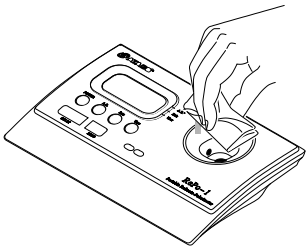
①Press (POWER).



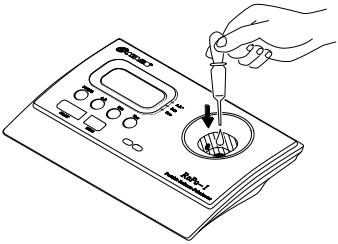
The cursor indicates the last used scale.

2 **Zero setting** (☞ page 5)

①Wipe the sample stage clean.

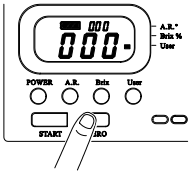


②Fill the sample stage with water up to the fill line.

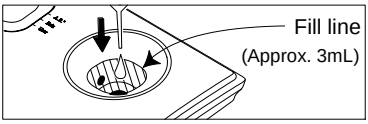


③Press [ZERO].

000 is displayed.



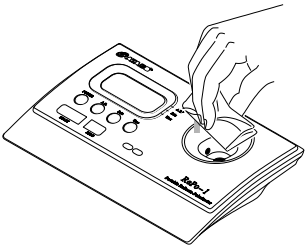
Sample volume



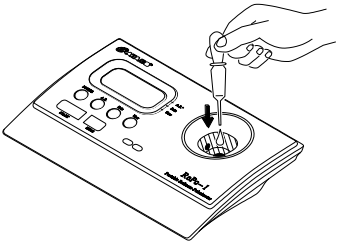
3 **Measurement and Evaluation**

(☞ page 6・page 7)

①Wipe the sample stage clean.

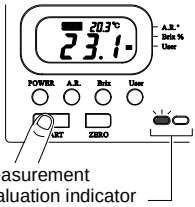


②Fill the sample stage with the sample solution up to the fill line.



③Press [START].

The measurement value is displayed. The green/red indicators notify whether the measurement falls within or outside the user-programmed tolerance setting. (☞ page 7)



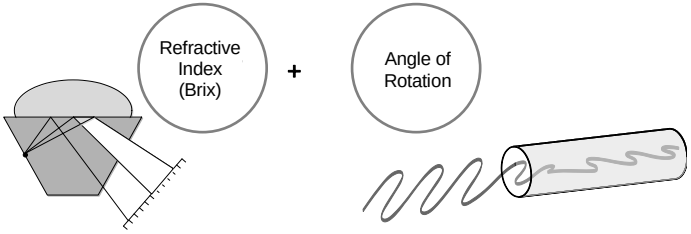
Measurement evaluation indicator

memo See page 8 for cleaning tips.

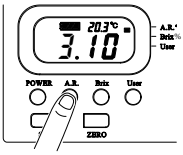
memo See page 9 for how to change the settings.

Main Features

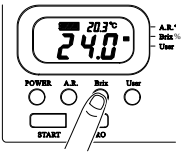
Dual-purpose: Refractive Index (Brix) and Angle of Rotation Measurements



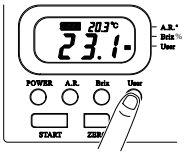
Multi-scale: Angle of Rotation; Brix; Purity; International Sugar Scale; Specific Rotation; Concentration



Angle of Rotation



Brix (%)

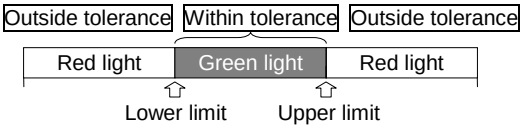


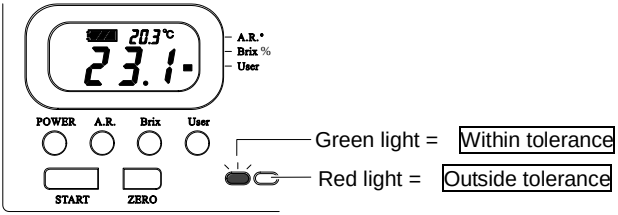
Press (User) to select the desired scale – International Sugar Scale; Purity (factory default); Specific Rotation; or Concentration

Measurement Evaluation Indicator

The measurement values are evaluated against the pre-set tolerance, and the green/red light will indicate the results.

See page 10 for how to configure upper and lower limits.





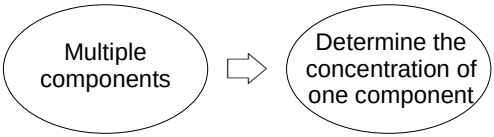
Main Features

The One and Only Polarimeter That Doesn't Use Observation Tubes

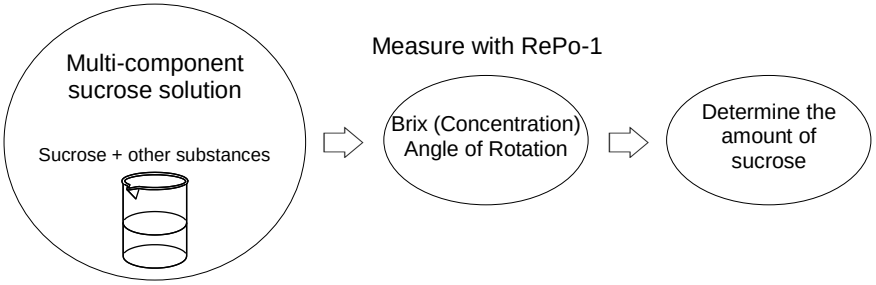
The instrument measures angle of rotation equivalent to a 20mm observation tube. Conversions to other observation tube lengths can be done by calculation.
Instrument's displayed angle of rotation × (Length of observation tube you wish to convert ÷20mm) ＝ Converted observation tube's angle of rotation

Example:
When the instrument's displayed angle of rotation is －2°:
Conversion to 100mm observation tube: －2°×(100÷20)＝－10°
Conversion to 200mm observation tube: －2°×(200÷20)＝－20°

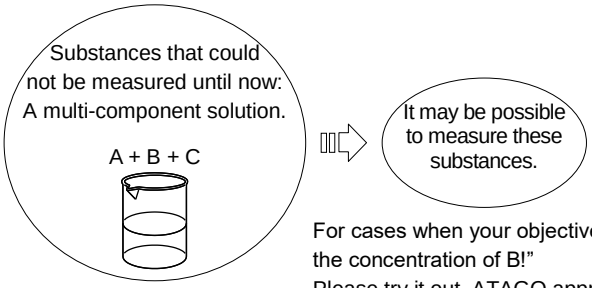
A fusion of index of refraction and angle of optical rotation -Making the invisible, visible-



Example: Concentration (Brix) and Angle of Rotation ⇒ Purity
Concentration and angle of rotation of sugar cane juice
⇒ sucrose content (purity)



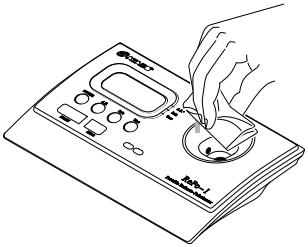
Can the purity scale be used to determine the concentration of one solute in a solution with multiple solutes? How about for my unique application?
⇒ For further information, please contact ATAGO!



For cases when your objective is, "I want to know the concentration of B!"
Please try it out. ATAGO appreciates your

Useful Features

Adjust Auto Shut-off Timer (☞ page 12)



Is the unit turning itself off too soon?

⇩

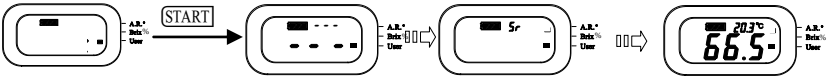
Choose from timer options of 4, 10, or 30 minutes.

Turn on Backlight

Backlight stays on for 1 minute after any button is pressed.

View Scale Information

During measurement: Press START to display the scale name abbreviation next to the battery indicator.



After measurement: The cursor indicates the last used scale.

Angle of Rotation — Brix (%) — User (Purity, International Sugar Scale, Specific Rotation, or Concentration)

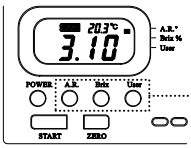
After measurement: Press one of the scale buttons to display the following scale name abbreviation next to the battery indicator.

⇩

Angle of Rotation	Brix (%)	Purity	International Sugar Scale	Specific Rotation	Concentration
rot	br ı	PUr	ıSS	Sr	con

Then, the measurement in the selected scale is displayed.

Change Scale



Press the desired scale button.

(A.R.): Angle of Rotation

(Brix): Brix (%)

(User): Every time (User) is pressed, the other scales cycle through in the following order:
Purity→International Sugar Scale→Specific Rotation→Concentration

Contents

Precautions for use

Introduction

Thank you for purchasing the instrument. Carefully read and follow all instructions. Keep this manual for future reference.

Safety Instructions

Read and follow all safety instructions before operating the instrument.
Failure to comply with the following instructions may result in personal injury or property damage.

⚠ WARNING

- Ensure safety when handling hazardous materials. Observe precautionary measures and use protective equipment, Be aware of the hazards of such chemicals and emergency response guidelines.
- ATAGO may not be held liable for any injury or damage arising in connection with handling of hazardous materials during the use of the instrument.
- Do not drop the instrument or subject it to strong physical shock.
- Do not attempt to repair, modify, or disassemble the instrument.

⚠ CAUTION

- Carefully read this manual to have basic knowledge of the function of each component.
- Some acids may corrode the glass prism, optical path window, and/or (metal) sample stage, which may cause erroneous measurements.
- Do not use metal tools, such as a spoon, as they may scratch the prism or the optical path window, resulting in erroneous measurements.
- Only use the specified battery type. Observe proper polarities, properly aligning the anodes and cathodes.
- Store the instrument away from direct sunlight/heat sources and excessive amounts of dust/debris.
- Store the instrument in a dry environment.
- Do not expose the instrument to a rapid change in ambient temperature.
- Do not subject the instrument to strong vibration.
- Do not subject the instrument to extreme cold temperature.
- Do not place the instrument under anything heavy.
- Have the batteries and battery compartment cover removed during air transport.

〈Chemical Resistance of Body Case〉

- The body case is made of ABS resin. Do not expose it to water vapor or solvents.

Aqua regia / chromic acid / chlorosulfuric acid / hydrobromic acid / nitric acid / hydrofluoric acid / sulfuric acid / phosphoric acid / ethyl acrylate / butyl acrylate / ethyl acetoacetate / acetophenone / benzyl benzoate / ethylbenzene / ethylene oxide / ethylenediamine / ethylene chlorohydrin / epichlorohydrin / ethyl chloride / benzyl chloride / methyl chloride / chlorinated solvents / xylene (xylol) / cresol / chloroacetone / chlorotoluene / chloroform / acetic acid / amyl acetate / isopropyl acetate / ethyl acetate / butyl acetate / propyl acetate / methyl acetate / diphenyl oxide / diisopropyl ketone / carbon tetrachloride / dioxane / cyclohexanone (anone) / dichlorobenzene / dibutyl phthalate (DBP) / dimethylformamide (DMF) / dimethylaniline / phenol / thioalcohol (mercaptan) / tetrahydrofuran (THF) / trichloroethylene / toluene (toluol) / ethylene dichloride / dichloromethane / nitroethane / nitropropane / nitrobenzene / nitromethane / perchlorethylene / fluorobenzene / methyl methacrylate / methyl isobutyl ketone / methyl ethyl ketone / monochloroacetic acid / monochlorobenzene / liquid chlorine / thionyl chloride / sodium peroxide / bromine / benzene / lacquer

Note Solvents that are harmful to the plastic body case include but are not limited to the above substances.

1. Overview

1. Contents

- Main unit····· 1
- Instruction Manual (this book) ····· 1
- AAA batteries ····· 4

2. Components and Functions

START button (START)
M Take a measurement.
S Select a setting item.

Measurement modes = M
Settings = S

POWER button (POWER)
Turn on in the measurement mode.

LCD
Displays the measurement values, temperature/scale, and battery indicator.

Sample stage
Apply the sample to be measured.

Prism
Measures the Brix (%).

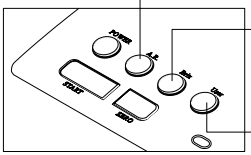
Fill line
Indicates a sufficient amount of liquid.

Optical path window
Polarized light is emitted and received.

ZERO button (ZERO)
M ZERO set.
S Confirm the selection.

Measurement Evaluation Indicator
Either the green or red light comes on when the measurement value is within or outside the tolerance range respectively.

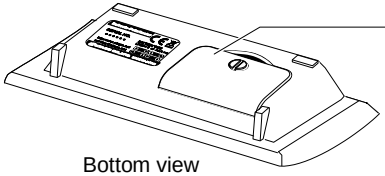
Scale button



A.R. button (A.R.)
M Select the angle of rotation scale.
S Move to the next place value.

Brix button (Brix)
M Select the Brix (%) scale.
S Increase the value.

User button (User)
M Select from : Purity; International Sugar Scale; Specific Rotation; or Concentration
S Decrease the value.

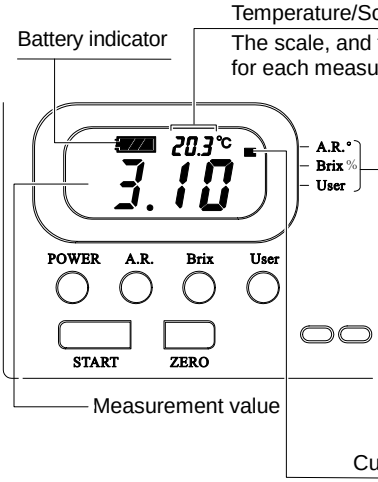


Bottom view

Battery compartment

Place and remove batteries from here.(☞ page 4)

LCD

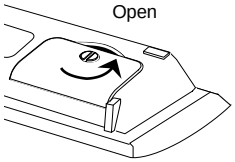


3. Battery Replacement

⚠CAUTION
- When the battery icon indicates the low power level (▭), replace all four batteries with a brand new set of AAA alkaline batteries (1.5V).
- Check the expiration dates on batteries before purchase.
- Remove the battery from the unit when the unit is not to be used for a month or so.

①Turn the screw counterclockwise with a flat-head screwdriver or a coin to open the battery compartment.

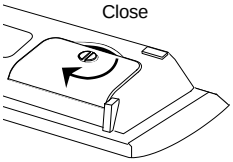
Open



②Insert the batteries, observing the correct polarity.

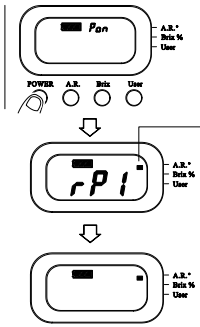
③Close the battery compartment and turn the screw clockwise.

Close



4. Power ON/OFF

Powering on

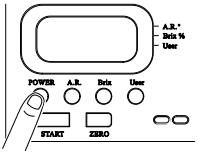


①Press (POWER).
Turn the instrument on in the measurement mode.
The backlight stays lit for 1 minute.
The cursor indicates the last used scale.

memo The backlight stays on for 1 minute after any button is pressed.

memo To access the settings, while the power is turned on, press and hold “user”, then 1 second later, press “Power” (☞ page 9).

Powering off



①Hold down (POWER).
The screen will turn off.

memo The instrument will turn itself off after 4 minutes of inactivity by default.
The auto shutdown timer can be extended to 10 minutes or 30 minutes (☞ page 12).

2. Basic Operations

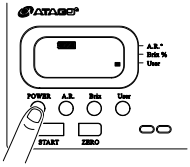
⚠CAUTION
- Operate away from direct sunlight at a stable temperature with as little fluctuation as possible.
- Acclimate both the instrument and sample solution to room temperature to ensure accurate results. Measurements may fluctuate with hot or cold samples. Wait to press START after placing the sample on the prism. Alternatively, press START multiple times.
- Operate on a flat work surface.
- The displayed temperature is that of the prism and may not necessarily match the temperature of the sample.

1. Zero-setting

This is the operation to set the calibration point (zero) for optical rotation and Brix.

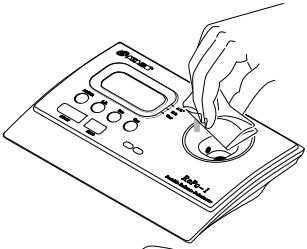
Note Zero-set the instrument at the beginning of each day before use.

Note Regular zero-setting throughout the day is recommended to ensure accurate results.

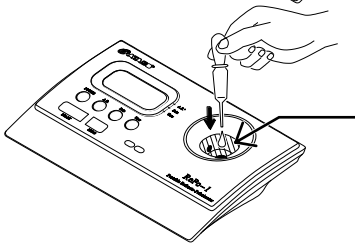


① Press POWER to turn it on.

Note Optical rotations and Brix can be zero-set in any scale, however, when the optical rotation scale is selected, even when Brix zero-set is an error, no error message will display.

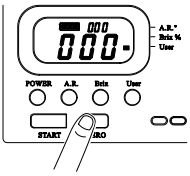


② Wipe the sample stage clean.



③ Fill the sample stage with tap water up to the fill line.

memo Use room temperature tap water. The instrument should also be acclimated to room temperature prior to operations.

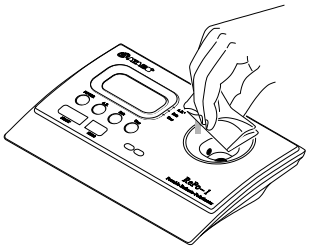


④ Press ZERO.

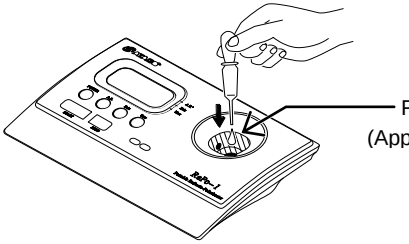
000 flashes and stops.

memo To perform zero-setting on the optical rotation scale and check whether Brix zero-setting was done correctly, press Brix and check that 000 is displayed.

2. Measurements



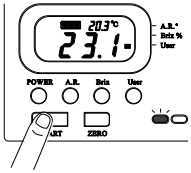
①Wipe the sample stage clean.



②Fill the sample stage with the sample solution to the fill line.

memo Measure room temperature (distilled) samples. The instrument should also be acclimated to room temperature prior to operations.

memo Try stirring the sample on the sensor during measurement to improve the repeatability of oily/fatty samples.



③Press START.
---flashes, and then the scale name is displayed next to the battery indicator. Then, the measurement value and temperature will be displayed.

Note The measurement evaluation indicator will light up if a tolerance is set for the scale used (☞ page 10).

Note The indicator will not activate for erroneous results (including temperature errors).

Note Set the upper and lower limits to 00.0 to turn off the measurement evaluation indicator.

〈Measurement Evaluation Indicator〉

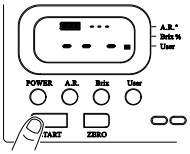
Example: When the Purity scale is configured with a lower limit of 95.0% and an upper limit of 105%.

Sample A Sample B Sample C Sample: Sucrose solution (26.0g/100mL)

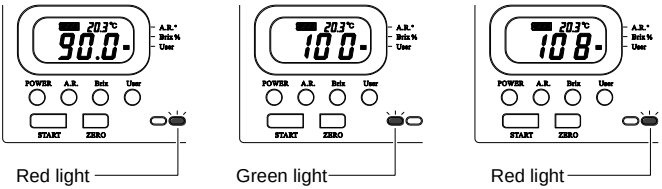
90.0% 100% 108%

①Select the Purity scale.

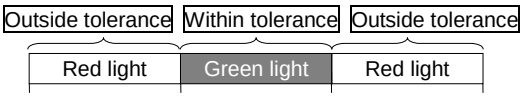
②Press START to take a measurement.
--- will appear.



Red/Green Light Indication



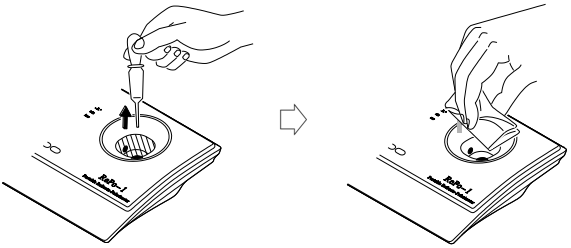
Outside tolerance	Within tolerance	Outside the tolerance
Sample A	Sample B	Sample C
90.0%	100%	108%



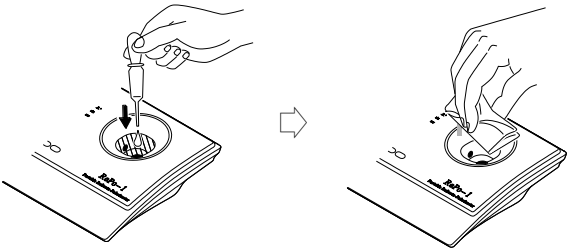
+95.0% to +105%

3. Cleaning

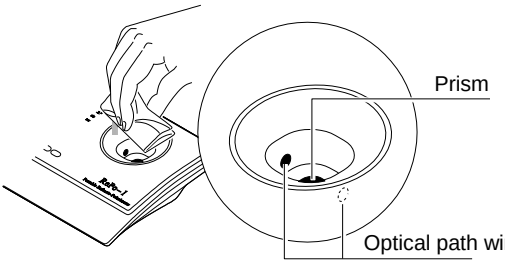
⚠CAUTION
- Ensure that the sample stage is clean before measurement.
- Clean the sample stage immediately after each measurement.
- Thoroughly dry the instrument before storing.
- Do not use benzene (paint thinner) on the instrument.
- Store away from direct sunlight at a stable temperature with as little fluctuation as possible.



①Collect the sample solution with a pipette and wipe it off.



②Apply some water and wipe it off.



③Dry the sample stage completely with dry tissues.

memo Clean the prism and the optical path window particularly well.

For oily samples

Clean oily residues with ethyl alcohol or mild soap, and then, rinse with water.

Mild soap　Ethyl alcohol

Can be washed under running water.
Thoroughly dry the instrument before storing.

memo Moisture may accumulate in the grooves of the buttons, but this will not affect the instrument.

4. Settings

How to Access Settings

This section will explain how to change settings after accessing the menu.

①While the power is turned on, press and hold “user”, then 1 second later, press “Power”.

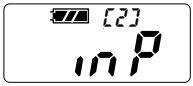
②Press START to move to the next setting item.

③Press ZERO to select the setting.

User
↓ after 1 second
User + POWER

ZERO ⇨ 1. Tolerance Setting (☞ page 10)

START

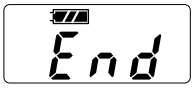


ZERO ⇨ 2. Concentration/Specific Rotation Setting (☞ page 11)

START

ZERO ⇨ 3. Auto Shutdown Timer Setting (☞ page 12)

START



ZERO

START

Return to [1] JU.

Exit the settings. Return to the measurement mode.

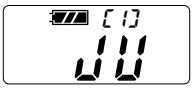
1. Tolerance Setting [Factory default: lower limit = -5.00, upper limit = +5.00 in Angle of Rotation]

Set upper and lower limits for a scale, and the indicator will light up to notify if a measurement falls within or outside the tolerance.

Range: -999 to +999

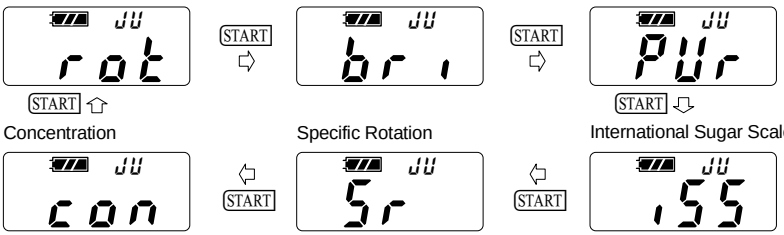
Resolution
(regardless of positive or negative value):
> 100 : 1
10.0 to 99.9 : 0.1
< 9.99 : 0.01

How to access the setting (☞ page 9)



ZERO ⇩

Note A tolerance can be set for no more than 1 scale at a time.



ZERO ⇩ Confirm the scale.

Enter the upper limit.

(6) Value
(5) Decimal point
(4) Value
(3) Decimal point
(1) Sign
(2) Value

①A.R.→While (1) is flashing ⇨ Select the sign by Brix or User.
②A.R.→While (2) is flashing ⇨ Increase the value by Brix.
⇨ Decrease the value by User.
③A.R.→While (3) is flashing ⇨ Choose to insert a decimal point by Brix or User.
④A.R.→While (4) is flashing ⇨ Same as ② above.
⑤A.R.→While (5) is flashing ⇨ Same as ③ above.
⑥A.R.→While (6) is flashing ⇨ Same as ② above.

memo When cancelling settings, press START. Proceed to lower limit value input.

ZERO ⇩Confirm the upper limit.

Enter the lower limit.

memo When cancelling settings, press START.

ZERO ⇩Confirm the lower limit. "SEt" will flash on the display.

Note Set the upper and lower limits to 0.00 to turn off the measurement evaluation indicator.

memo The tolerance range is different from the display range.

memo The last used scale will be selected upon returning to the measurement mode.

START ⇩ Exit the setting.

memo Press ZERO to continue to edlit the setting.

ZERO ⇩

Return to the measurement mode.

2. Concentration/Specific Rotation Setting

Range: Concentration 0.00 to 999
Specific Rotation -999 to +999

[Factory default: Concentration of 26.0g/100mL, Specific Rotation of 66.6°]

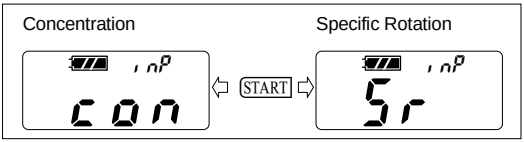
Resolution
(regardless of positive or negative value):
> 100 : 1
10.0 to 99.9 : 0.1
< 9.99 : 0.01

How to access the setting (☞ page 9)

To measure Concentration ⇨ enter Specific Rotation
To measure Specific Rotation ⇨ enter Concentration

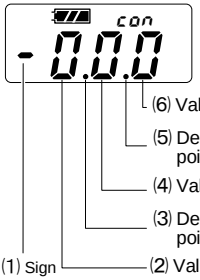
ZERO ⇩

memo Both variables can be configured.



ZERO ⇩ Confirm the scale.

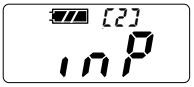
Enter the value.



①(A.R.)→While (1) is flashing ⇨ Select the sign by (Brix) or (User).
②(A.R.)→While (2) is flashing ⇨ Increase the value by (Brix).
⇨ Decrease the value by (User).
③(A.R.)→While (3) is flashing ⇨ Choose to insert a decimal point by (Brix) or (User).
④(A.R.)→While (4) is flashing ⇨ Same as ② above.
⑤(A.R.)→While (5) is flashing ⇨ Same as ③ above.
⑥(A.R.)→While (6) is flashing ⇨ Same as ② above.

memo When cancelling settings, press START.

ZERO ⇩Confirm the value. "SEt" will flash on the display.



START ⇩ Exit the setting.

ZERO ⇩

Return to the measurement mode.

memo The last used scale will be selected upon returning to the measurement mode.

memo Press ZERO to continue to edit the setting.

3. Auto Shutdown Timer Setting [Factory default: 4 minutes]

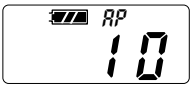
Choose from the following 3 timer options.

How to access the setting (☞ page 9)

ZERO ⇩

Turn off after 4 minutes of inactivity

START ⇦ Turn off after 10 minutes of inactivity



⇨ START

⇦ START Turn off after 30 minutes of inactivity

ZERO ⇩ Confirm the selection. "SEt" will flash on the display.

START ⇩ Exit the setting.

memo The last used scale will be selected upon returning to the measurement mode.

memo Press ZERO to continue to edit the setting.

ZERO ⇩

Return to the measurement mode.

5. Scales

ANGLE OF ROTATION - Denoted by "α" and expressed in degrees ("°")

The rotation of polarized light is observed when polarized light that is oscillating unidirectionally rotates as it passes through a liquid. The measurement of the angle of such rotation is called the "Angle of Rotation."
The angle of rotation is the basic numeric value measured by polarimeters and are dependent on the concentration of the liquid, the length of the observation tube, temperature, and the measurement wavelength.
The instrument measures angle of rotation equivalent to a 20mm observation tube.

Brix (%)

Brix (%) represents the weight of sucrose in 100 grams of sucrose solution as percentage by weight. When other dissolved solids are present in the solution, Brix (%) conversion may be applied.
Brix (%) is a measure of the total dissolved solids in a solution and indicates the combined concentration of all soluble substances, such as sugar, salt, protein, and acids.
The readings are corrected, based on the temperature of the prism, within the automatic temperature compensation range.

PURITY - Expressed in %

The Purity is the proportion of sucrose comprised in a soluble solid content (a sample).
Sucrose content is symbolized by "POL," and is determined by the following formula:

POL = (26.016/Mass (density) of 100mL) × International Sugar Scale

The mass (density) of 100mL is determined by the Brix (%) value that has been input into the instrument beforehand.
The purity is determined by the sucrose content and the Brix (%) value, using the following formula:

Purity = (POL/Brix) × 100

The instrument displays temperature-compensated purity, based on the angle of rotation and Brix measurements.
Purity readings are always positive, but negative values are also displayed when the angle of rotation is negative.

INTERNATIONAL SUGAR SCALE (ISS) - Expressed in °Z

The International Sugar Scale is determined by the following formula:

International Sugar Scale = Angle of Rotation × 2.888

The measurement value of 26.000g/100cm^3 of sucrose solution in a 200mm observation tube is 100°Z.
This measurement value is commonly used in the sugar manufacturing industry and is usually temperature-compensated to the reference temperature of 20˚C or 68˚F.
The instrument multiplies the angle of rotation readings with the 20mm observation tube by 10 (to calculate the equivalent readings with a 200mm observation tube) to compute the °Z values.

SPECIFIC ROTATION - Denoted by "[α]" and expressed in degrees ("°")

The Specific Rotation is a numeric value unique to each substance. By definition, the specific rotation value is equivalent to the angle of rotation obtained by a measurement using a solution of 100% concentration in a 100mm observation tube (although such a measurement is actually not practicable). The specific rotation is determined by the following formula:

Specific Rotation = (10,000 × Angle of Rotation)/(length of observation tube [mm] × Concentration [g/100mL] *1)

*1 **Note** To measure the specific rotation, input the concentration value of the sample to be measured into the instrument before taking a measurement. (☞ page 11)

CONCENTRATION - Expressed in g/100mL

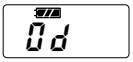
The Concentration is the density of an optically active substance dissolved in water or alcohol. The concentration is determined by the following formula:

Concentration = (10,000 × Angle of Rotation)/(length of observation tube [mm] × Specific Rotation *2)

*2 **Note** To measure the concentration, input the specific rotation value of the sample to be measured into the instrument before taking a measurement. (☞ page 11)

6. Error Messages

The battery power is low.

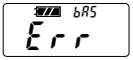


Not enough light could pass through the sample solution to take the angle of rotation measurement.
⇨ Dilute or filter the sample before measuring.

An error has occurred while adjusting the setting.

Too much external light is interfering with the measurement.
⇨ Shade the sample stage with your hand and measure again.
∗ This error message may also appear if the sample temperature is too low.

The sample measured above the measurement range.



Measurement error.
(When User scale is selected)
⇨ Press (A.R.) and (Brix) to view the detail of the error.

The sample measured below the measurement range.

(Example)

The sample measured below 3.9˚C (16.9˚C in the Purity or ISS scale).

ZERO was pressed with nothing or something other than water on the sample stage. (When Brix or User scale is selected)

(Example)

The sample measured above 41.1˚C.

7. Inspection

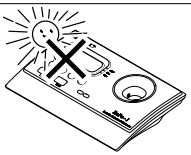
Regular inspection is recommended to ensure accurate results. Keep a regular schedule, such as the beginning of each month. Inspect the instrument as needed - when the instrument has been dropped, or the measurements seem to be abnormal.
The standard liquid is available from ATAGO.

- RE-99110　RePo Standard liquid

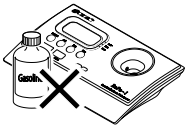
〈Inspection of the instrument with standard liquid〉

①Prepare the instrument for basic operations according to the instruction manual.
②Zero set the instrument with room temperature distilled water.
③Measure the Brix and Angle of Rotation of the standard liquid (2 or 3 times repeatedly).
④If the measurements are within accuracy, the instrument is calibrated correctly.
If the measurements are not within accuracy, review the procedures to measured correctly.

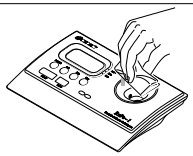
8. Storage and Maintenance



Store the instrument in a dry place away from direct sunlight. Exposure to humidity and heat may damage the instrument.



Do not use organic solvents (paint thinner, benzene, gasoline, etc.) on the plastic body case.
(☞ page 1)



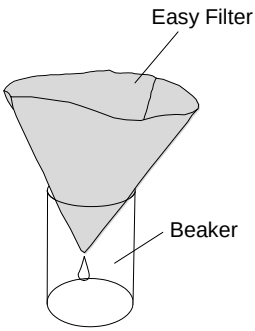
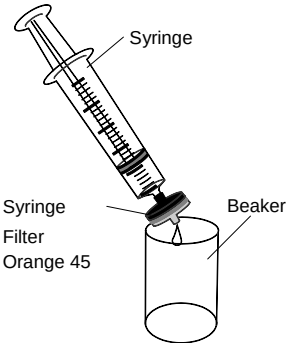
Clean and dry the sample stage thoroughly, following the “Cleaning” instructions. (☞ page 8)
Store the unit away from direct sunlight at a stable temperature with as little fluctuation as possible.

9. Optional Accessories and Consumable Items

Contact ATAGO or your ATAGO distributor to place an order or for any inquiries.

Name	Part No.	Notes	
MAGIC™ for RePo	RE-79000		
Beaker 100mL	RE-79423	For sample filtration	
Easy Filter (100pcs)	RE-79422	For sample filtration	
Syringe Filter Orange 45 (100pcs)	RE-79420	For sample filtration (use with Syringe)	
Syringe 20mL (3pcs)	RE-79421	For sample filtration (use with Syringe Filter Orange 45)	
RePo Small Volume Adapter	RE-72093	For measuring small volume (0.6mL or more) sample	
RePo Reduced Optional Path Adapter 5mm	RE-72094	For measuring at 5mm optical path	Set of RE-72095 and RE-72096
RePo Reduced Optional Path Adapter 5mm (Adapter only)	RE-72095		
RePo Reduced Optional Path Adapter 5mm (Glass Cell only)	RE-72096		
RePo Reduced Optional Path Adapter 10mm	RE-72097	For measuring at 10mm optical path	Set of RE-72098 and RE-72099
RePo Reduced Optional Path Adapter 10mm (Adapter only)	RE-72098		
RePo Reduced Optional Path Adapter 10mm (Glass Cell only)	RE-72099		
RePo Standard Liquid	RE-99110		

How to Use the Sample Filters

Easy Filter	Syringe Filter
	 **Note** Please be sure to tightly attach the syringe filter to the syringe. **Note** When pushing sample through the filter, please hold the filter to avoid from separating from the syringe.

memo For samples that take time to filter or require force when using the syringe filters, please filter them with the easy filters first.

10. Warranty and Repair

The instrument is a precision electronic instrument that consists of optical and electronic parts.
When the interaction between light and electricity causes malfunction of the instrument, the source of the problem may be difficult to identify.
Repair and adjustment of the instrument require expertise in electronics and optics.
Only authorized service providers who have completed the maintenance training can disassemble and repair the instrument beyond the simple inspection and replacement of parts which are outlined in this manual.

1. Warranty

The instrument is warranted for one year from the date of purchase. This warranty is void if the instrument shows evidence of the following. Send the original batteries with the instrument if they are still in use.

- Having been disassembled by unauthorized personnel
- Having been misused and/or operated outside the environmental specifications
- Damages to prism, optical path windows, and/or sample stage
- Leakage from batteries other than those included with the unit
- Water damage or having been dropped

Repair services are available for a fee after the warranty expires.
Contact an ATAGO authorized service center for service and support.

2. Replacement Parts

Use only authentic parts to ensure the optimum performance of the instrument.
Replacement parts are generally available for 7 years after a model is discontinued.
Contact ATAGO, an authorized ATAGO distributor, or the original seller.

* Replacement parts may become unavailable from the suppliers within the 7-year period. Any repair services that require disassembly must be performed at an authorized ATAGO service center.

Please have the serial number information ready when contacting a service center.

11. Specifications

Product name	RePo-1
Measurement scales	Angle of Rotation, Brix (%), International Sugar Scale, Temperature (˚C, °F)
Measurement readings	Angle of Rotation, Brix (%),Temperature (˚C, °F) User (International Sugar Scale/Purity/Specific Rotation/Concentration) Brix (%), Purity, International Sugar Scale with Automatic Temperature Compensation
Measurement range	Angle of Rotation: -5.00 to +5.00° (These ranges are measured by the device's 20mm light path. These are convertible to below ranges: -25.00 to +25.00 with a 100mm observation tube -50.00 to +50.00 with a 200mm observation tube) Brix (%): 0.0 to 85.0% International Sugar Scale: -130 to +130°Z Temperature: 10.0 to 40.0 ˚C
Display range	Angle of Rotation: -5.99 to +5.99° Brix (%): -2.0 to 86.6% International Sugar Scale: -130 to +130°Z Measurements are round to 1 decimal place up to 99.9 and to a whole number above 100. Purity: -120 to 120% Measurements are round to 1 decimal place up to 99.9 and to a whole number above 100. Specific Rotation: -999 to +999° Measurements are round to 1 decimal place up to 99.9 and to a whole number above 100. Concentration: -2.0 to 999% Measurements are round to 1 decimal place up to 99.9 and to a whole number above 100. Temperature: 4.0 to 41.0 ˚C
Resolution	Angle of Rotation: 0.01° Brix (%): 0.1% International Sugar Scale: 0.1°Z Temperature: 0.1 ˚C
Measurement accuracy	Angle of Rotation: ±0.1° (at 20 ˚C) Brix (%): ±0.2% International Sugar Scale: ±3°Z (at 20℃) Temperature: ±1.0 ˚C
Repeatability	Angle of Rotation: ±0.05°(at 20 ˚C) Brix (%): ±0.1% International Sugar Scale: ±1.5°Z (at 20 ˚C)
Measurement time	12 seconds
Ambient temperature	15 to 40 ˚C
Storage temperature	0 to 65 ˚C
Temperature compensation range	Brix (%): 10 to 40 ˚C Purity: 18 to 40 ˚C International Sugar Scale: 18 to 40 ˚C
Sample volume	3mL
Measurement wavelength	589nm (equivalent to the sodium-D line spectrum)
Light source	LED
Power supply	Size AAA alkaline battery × 4
International protection class	IP67
Dimensions and weight	160×101×38mm, 325g (main unit only)

MEMO

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