# Recognizing Corporate Social Responsibility

Established in 1940, ATAGO has continuously made strides in the research and development of a wide variety of optoelectronic products, specifically focusing on refractometers. ATAGO directly controls the entire production process - designing, developing, assembling, and shipping. Our products are used in a variety of industries; from food and beverage processing, to petrochemicals and metalworking. ATAGO has an established reputation as a trusted brand and enjoys the fullest confidence of end-users, not only in Japan but also in 154 countries worldwide. Our continuing global expansion includes the establishment of ATAGO U.S.A in August 2001 to oversee the operations in North and Latin America. ATAGO INDIA Instruments Pvt. Ltd. in Mumbai, India was established as a sales office in February 2005, followed by ATAGO (THAILAND) Co., LTD in December 2009. ATAGO BRASIL Ltda. made a start in February 2010 to better serve the growing sugar industry in Brazil. ATAGO ITALIA s.r.l. opened in October of 2010, followed by ATAGO CHINA Guangzhou Co., Ltd. in March of 2011. The two most recent developments are the openings of ATAGO RUSSIA Ltd. in January of 2014 and ATAGO NIGERIA Scientific Co., Ltd. in May of 2015. While we have long enjoyed market presence domestically in Japan, our service to the global market is becoming increasingly important.
ATAGO has attained 80% of the market share in Japan, as well as 30% of the global market share. As a result, ATAGO is fully aware of our corporate responsibility as a member of the global community, and we seek to make a positive impact both locally and internationally.
Below is the history of ATAGO's charitable assistance to those who have been victims of natural disasters.

| | | |
|---|---|---|
| November | 2004 | Earthquake in Chuetsu, Niigata |
| September | 2005 | Hurricane Katrina in New Orleans |
| October | 2005 | Earthquake in Pakistan |
| June | 2006 | Earthquake in Central Java |
| April | 2007 | Earthquake in Noto Peninsula |
| July | 2007 | Earthquake in the coast of Chuetsu, Niigata |
| December | 2007 | Earthquake in Peru |
| May | 2008 | Earthquake in Sichuan |
| May | 2008 | Cyclone Nargis in Myanmar |
| June | 2008 | Earthquake in Iwate/Miyagi Inland |
| April | 2009 | Earthquake in Abruzzo |
| January | 2010 | Earthquake in Haiti |
| February | 2010 | Earthquake in Chile |
| August | 2010 | Flood in Pakistan |
| March | 2011 | Earthquake in New Zealand |
| March | 2011 | Earthquake off the Pacific Coast of Tohoku Region in Japan |
| November | 2012 | Hurricane Sandy in Eastern United States |
| November | 2013 | Typhoon in the Philippines |
| March | 2014 | Syrian Refugee Crisis |
| August | 2014 | Ebola Outbreak |
| April | 2015 | Earthquake in Nepal |
| September | 2015 | Typhoon 18 (Etau) in Japan |
| February | 2016 | Earthquake in Taiwan |
| April | 2016 | Earthquake in Kumamoto |
| April | 2016 | Earthquake in South America Ecuador |

As new regulations and requirements are imposed in the marketplace, the competition is expected to become fiercer. Being true to our mission statement: "Let's synergize. Let's advance. Let's create." ATAGO is devoted to making strides in the research and development of scientific instruments to meet the ever-changing demands of our clientele.

### Standard & Poor's Rating

ATAGO has received the top grade "aaa" from Japan SME (Small & Medium Sized Enterprise) Rating 6 consecutive times; in 2007, 2008, 2014, 2015, 2016, 2017 and in 2018. This grade is presented by Standard & Poor's, a well-known provider of independent credit ratings.

### Excellence in Tax Declaration

In November 2007, ATAGO received recognition of excellence from the Itabasi revenue office for the tax honesty, stable profitability, and transparent business model in 2002 and 2007.

### Global Niche Top Companies Selection 100

In recognition of outstanding achievements in global expansion and development, a prominent presence in the digital refractometer industry, and for innovation and originality, ATAGO was selected for the "Global Niche Top Companies Selection 100" award by The Ministry of Economy, Trade and Industry (METI) in Japan.

All ATAGO products are designed and manufactured in Japan.


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| | | |
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| ATAGO INDIA Instruments Pvt. Ltd. | TEL : 91-22-28544915, 40713232 | customerservice@atago-india.com |
| ATAGO THAILAND Co.,Ltd. | TEL : 66-21948727-9 | customerservice@atago-thailand.com |
| ATAGO BRASIL Ltda. | TEL : 55 16 3913-8400 | customerservice@atago-brasil.com |
| ATAGO ITALIA s.r.l. | TEL : 39 02 36557267 | customerservice@atago-italia.com |
| ATAGO CHINA Guangzhou Co.,Ltd. | TEL : 86-20-38108256 | info@atago-china.com |
| ATAGO RUSSIA Ltd. | TEL : 7-812-777-96-96 | info@atago-russia.com |
| ATAGO NIGERIA Scientific Co.,Ltd. | TEL : 234-707-558-1552 | atagonigeria@atago.net |
| ATAGO KAZAKHSTAN Ltd. | TEL : 7-727-257-08-95 | info@atago-kazakhstan.com |

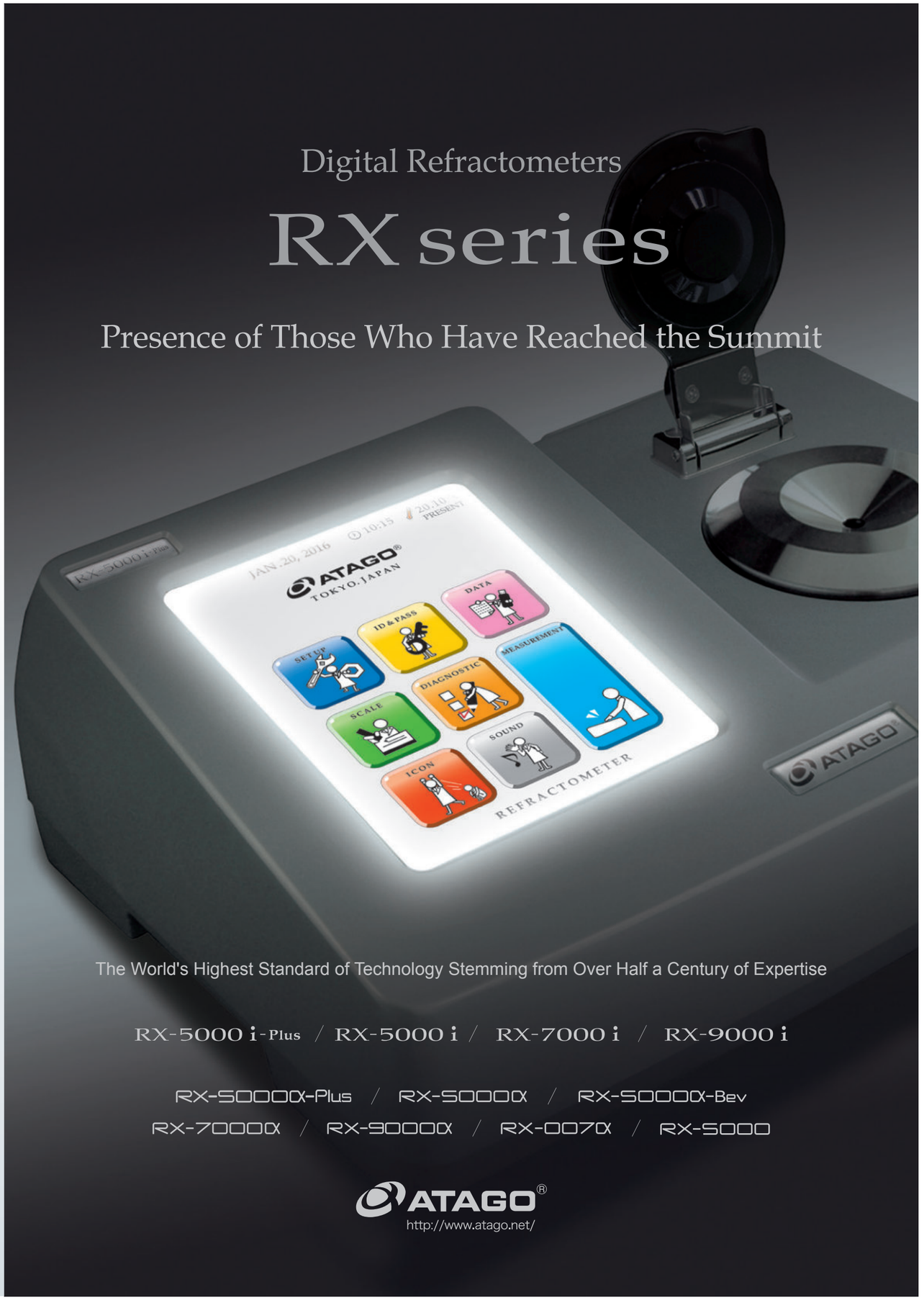

HACCP GMP GLP
ATAGO products comply with HACCP, GMP and GLP system standards.

Digitally signed by Şeremet Petru
Date: 2021.08.14 15:30.28 EEST
Reason: MoldSign Signature
Location: Moldova

* Specifications and appearance are subject to change without notice.



ENV.03 19041000OP Printed in Japan




# Why Choose ATAGO?

## Made with Japanese quality.

### 1 Proud Heritage and Experience

ATAGO has over 70 years of experience in optical instrument manufacturing. With our expertise cultivated over decades, as well as an extensive selection of instruments, we can meet a variety of measurement needs including highly specialized industries.

### 2 Industry-Leading Technology

Refraction of light has been our sole specialty throughout the existence of ATAGO, and we strive for perfection in optical systems. We listen to end-user feedback from 154 countries and continuously push the limit of refractometry.

### 3 Trusted Product Support

We dedicate ourselves on the high durability and low failure rate of ATAGO products. Our repair service is carried out in a timely manner. Calibration certificates are available.



# For the Utmost in Customer Satisfaction…

## Free Demo Units

For those considering to purchase an ATAGO product, we offer demo units, free of charge. Potential users are able to directly experience our products ease of use, precision, and accuracy. Our ultimate priority is ensuring customers are completely satisfied before making a purchase.

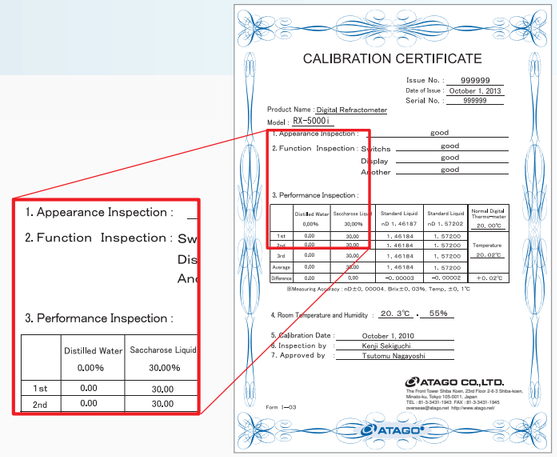
Free Demonstration Units Available.
Please contact ATAGO Customer Service.

**www.atago.net/**

## Calibration Service

ATAGO offers calibration service in conformance with ISO quality management systems as well as HACCP, GMP and other standards. The following three documents will be issued. (Calibration service is performed at an additional cost.)

- Calibration Certificate
- Traceability Certificate
- Traceability Diagram




## 2 Years Standard Warranty (3 years with product registration)

The RX series come standard with a two year limited warranty against manufacturer's defects from the date of the original purchase. The warranty period can be extended to three years if the product is registered with ATAGO.
Warranty service for eligible repairs is provided at no charge. There will be fees associated with any services provided after the warranty period expires.
Contact ATAGO, an authorized ATAGO distributor, or the original seller.

Below are exclusions to the warranty:

- Damage as a result of accident, misuse, abuse, or improper site preparation/maintenance
- Damage as a result of disassembly by anyone other than authorized service providers

**online at: www.atago.net/registration/**

# RX-i series

The world's highest standard of technology now available with touch screen.
ATAGO taking refractometers to the next level.

Highlighted sections denote the difference in specifications between the i series and the α series.

## World's Highest Standard of Accuracy

The RX series are the most accurate of ATAGO refractometers programmed with a trusted and advanced algorithm.

## Ergonomically Designed Layout

The RX series was designed with ease of use in mind. The sample stage is placed on the right-side, while the buttons for operation and the LCD are placed on the left-side. This results in a distance of only 17 cm. Extensive research was performed in the design phase to ensure an ergonomic interface that made operation easy while maximizing efficiency.

## Password Security

The password feature allows only authorized personnel to perform certain operations. Assign a system level and password to limit each operator's activities.

When using multiple units…

## Resolve Measurement Value Discrepancy

With the manual calibration feature, measurement values can be adjusted to be consistent with multiple units.

## Reliability

The new and advanced algorithm allows for more stable readings every time.

## Speedy Measurement Results

Once the sample temperature has stabilized, measurement takes only a few seconds. Results are displayed instantly with excellent repeatability.

## Visual "Pass / Fail" Indication

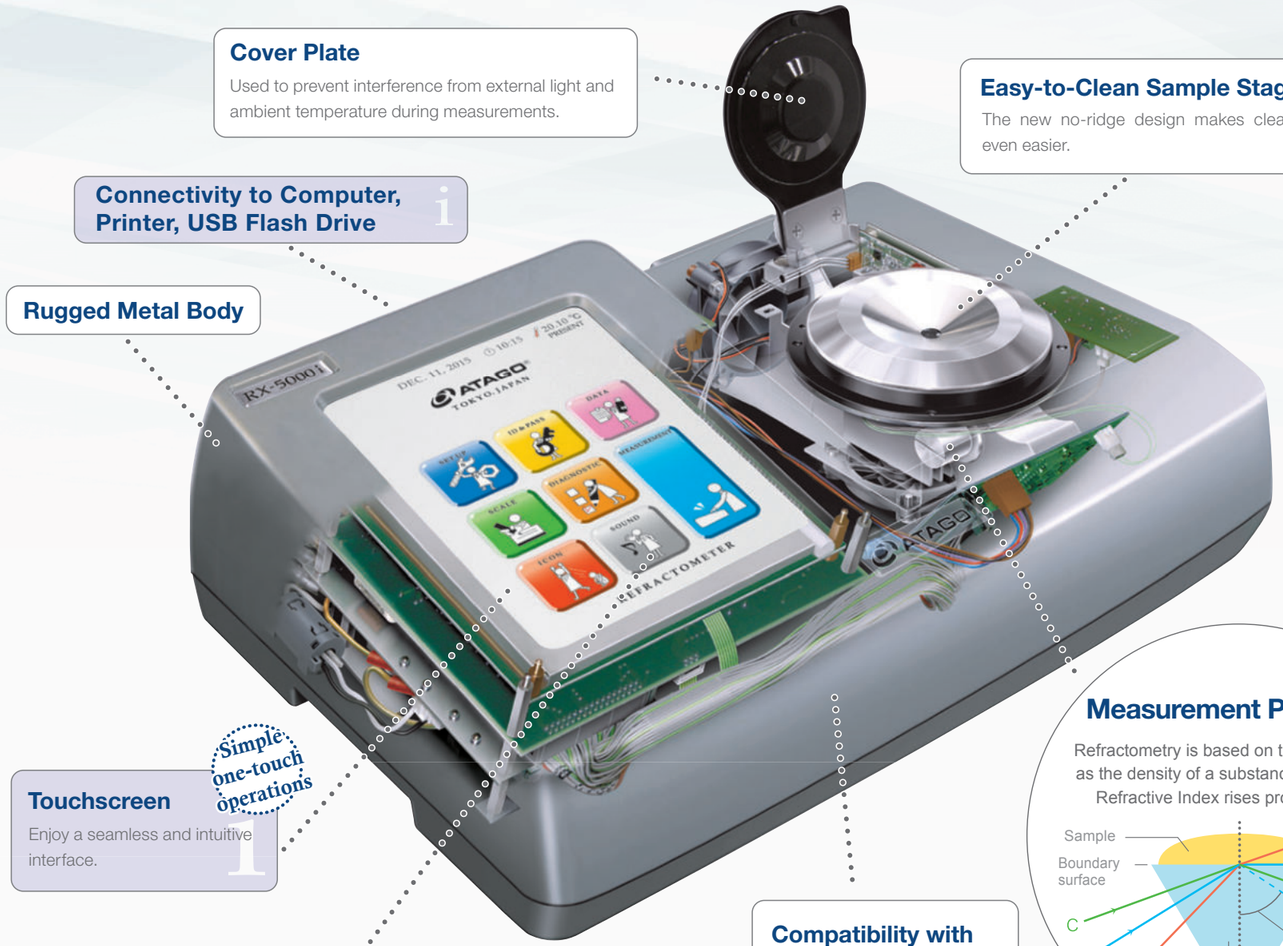
Quickly identify if the measurement value is within the target range with the graphic display. Up to 100 sample types can be programmed to improve inspection efficiency.

## Measurement History

The built-in memory will instantly recall the last 500 measurement values.

## Programmable User Scale

Enter 3 to 5 data points of a scale, other than Brix, to directly display the concentration of specific solutions, such as DMF, and more. Save time and increase efficiency by eliminating the need to refer to manual conversion tables.




### Cover Plate

Used to prevent interference from external light and ambient temperature during measurements.

### Connectivity to Computer, Printer, USB Flash Drive

### Rugged Metal Body

### Easy-to-Clean Sample Stage

The new no-ridge design makes cleaning even easier.

Fast and Easy

### Touchscreen

Enjoy a seamless and intuitive interface.

Simple one-touch operations

### Icons

Adorable icons will navigate you through the operations.

### Compatibility with Harsh Chemicals

The wetted parts can be customized with materials that are resistant to corrosive chemicals, such as acids, bases, and solvents.

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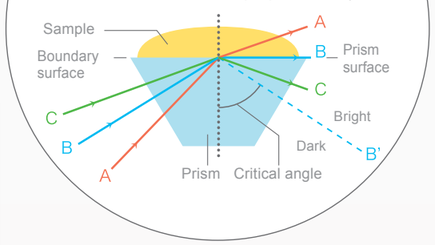
### Measurement Principles

Refractometry is based on the principle that as the density of a substance increases, its Refractive Index rises proportionately.




## 5 Measurement Mode Options

### MODE-S

**For emulsion samples**

Displays the measurement value once a certain level of sample stability is achieved.

### MODE-1

**For maximum accuracy**

Displays the measurement value once the sample reaches the target temperature.

### MODE-2

**For fast results**

Measures Refractive Index and temperature at fixed intervals and displays the estimated measurement value at the target temperature.

### MODE-3

**For no temperature control**

Provides an option to turn the thermo-module off. Without temperature control, the measurement value is displayed in 4 seconds after the START key is pressed.

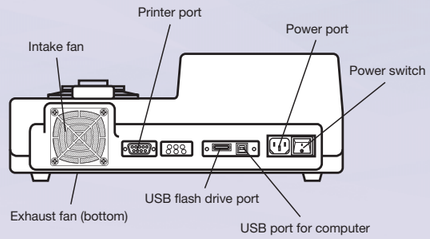
### MODE-T

**Recommended for measuring low Brix liquid samples (such as teas)**

Equipped only on the RX-5000i-Plus, MODE-T is recommended for users who place importance on obtaining highly repeatable results (Brix 0.001%).

## Printer Connectivity

GLP/GMP compliant - sample numbers, dates, time, measurement values, temperatures, and sample names - can be printed. Print items can be selected for customized reporting. Thermal dot or impact dot printer models available (see Accessories on page 17).




## Computer Connectivity

USB flash drive data storage capability. Data can be imported/exported on a computer through RS-232C (via USB virtual serial port) connectivity. Software is available to support your FDA 21 CFR Part 11 compliance.

FDA 21 CFR Part 11 software

## Rugged Metal Body

The sturdy, yet elegant die-cast metal body protects the optical system. A special coating on the surface adds extra durability against chemicals.

## Full Selection of Accessories

See Accessories on pages 16-17.

## Calibration Certificate

A calibration certificate can be ordered with each instrument for an additional charge. Please contact your ATAGO representative for further details.

## Wide Ambient Temperature Range

The ambient temperature range of 5 to 40°C allows measurements in a wide range of temperature conditions.

# RX-i series

Experience the ease of touch-screen technology.
Our world-class precision instrument continues to advance.

**ATAGO's Flagship, Most Accurate and Full Range**
RX-5000 i-Plus
The RX-5000i-Plus, one of the most accurate refractometers in the world is now even more stylish, smart, and functional.

**ATAGO's Basic Model**
RX-5000 i
The RX-5000i measures with the same accuracy level as the RX-5000α and provides reliable measurements with newly added functions and the touch screen operation. Its high measurement accuracy of ±0.00004 for refractive index (nD) and ±0.03% for Brix, makes it ideal for measurement of food, beverages, and sugar syrups.

**Wide Range and High Accuracy**
RX-9000 i
Features both the high accuracy of the RX-5000i and the wide refractive index range of the RX-7000i, making it capable of measuring substances with a high refractive index, such as fragrances, oils, and fats. It also comes with newly added functions, such as USB connectivity and self-diagnosis capability.

**Wide Range**
RX-7000 i
Features an extremely wide refratcive index range of 1.32422 to 1.70000, which makes it suitable for measuring substances with a high refractive index, such as fragrances, oils, and fats.

## Features

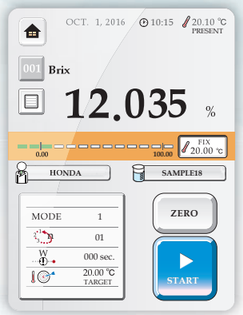
- FDA 21 CFR Part 11 Software Included in Standard Delivery.
- Measurement History
- Programmable User Scale
- Resolve Measurement Value Discrepancy
- Password Security
- Built-in Peltier Thermo-module

Additional upgrades from the RX-α series
- Icons
- Touchscreen
- USB Flash Drive
- Self-diagnosis
- Sound
- User Scale

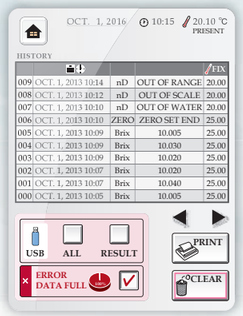
Improved touchscreen operability with intuitive, user-friendly icons. Equipped with a multitude of versatile functions, such as color-coded items and clear, easy-to-read text and characters.



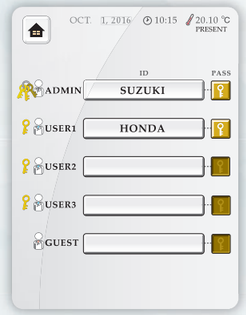
### Home Screen
The illustrated home screen makes it easy to identify the operation of your choice.



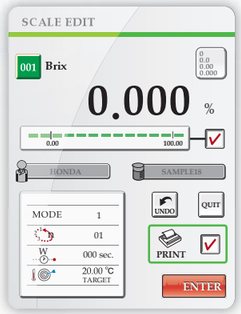

### Measurements
All basic operations - selecting scales and modes, taking and recalling measurements, and zero-setting - are at the tip of your finger.



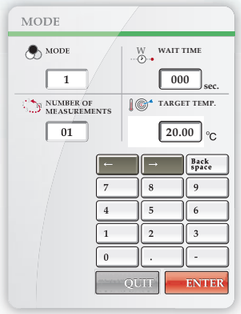

### Measurement History
Recall the last 500 measurements. Exporting data to a USB drive or a printer is only one touch away. The RX-i series is also equipped with a RS-232C port for direct computer connection.



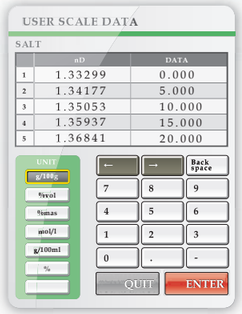

### High Security
4 levels of access control and 5 unique user passwords provide data security. The settings are user-configurable.



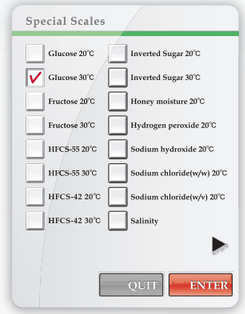

### Editing User Scales
There is no need to re-set the scale, mode, and temperature of programmed user scales each time. With the RX-i series, entering, editing, and copying user scales is a breeze. Up to 100 scales can be programmed.



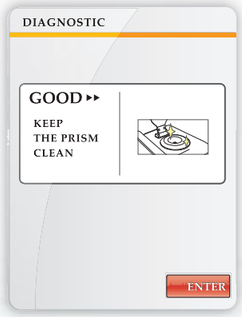

### 5 Measurement Modes
Select the measurement style that is most suited for the sample. Using the ten key pad, choose the measurement mode, enter the wait time, number of continuous measurements, and target temperature.



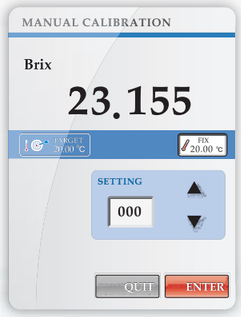

### User Scales
In addition to the refractive index (nD) and Brix scales, concentration scales for specific samples can be configured easily. Simply program corresponding refractive index values and concentration data points.




### Special Scales
The RX-i series comes pre-programmed with 23 of the most commonly used concentration scales.




### Self Assessment
The instrument can detect irregularities with the intensity of light or waveforms. Perform this assessment regularly to ensure accurate measurements.




### Manual Calibration
When measurement values differ among multiple units, manual calibration can be performed within the accuracy range to provide consistent readings across all units.


### Settings Menu
Navigation through the settings menu requires no effort. The icons provide quick and easy visual identification of operation.


### Theme Options
Choose from 6 different theme options for the home screen. Customize it to your taste or change it daily to fit your mood.

# RX-α series

Beautiful, functional design. User-tested ease of use.
True quality never becomes obsolete.
It only gets better with time.

Highlighted sections denote the difference in specifications between the i series and the α series.

## World's Highest Standard of Accuracy

The RX series are the most accurate of ATAGO refractometers programmed with a trusted and advanced algorithm.

## Ergonomically Designed Layout

The RX series was designed with ease of use in mind. The sample stage is placed on the right-side, while the buttons for operation and the LCD are placed on the left-side. This results in a distance of only 17 cm. Extensive research was performed in the design phase to ensure an ergonomic interface that made operation easy while maximizing efficiency.

## Password Security

The password feature allows only authorized personnel to perform certain operations. Assign a system level and password to limit each operator's activities.

When using multiple units…

## Resolve Measurement Value Discrepancy

With the manual calibration feature, measurement values can be adjusted to be consistent with multiple units.

## Reliability

The new and advanced algorithm allows for more stable readings every time.

## Speedy Measurement Results

Once the sample temperature has stabilized, measurement takes only a few seconds. Results are displayed instantly with excellent repeatability.

## Visual "Pass / Fail" Indication

Quickly identify if the measurement value is within the target range with the graphic display. Up to 60 sample types can be programmed to improve inspection efficiency.

## Measurement History

The built-in memory will instantly recall the last 30 measurement values.

## Programmable User Scale

Enter 3 data points of a scale, other than Brix, to directly display the concentration of specific solutions, such as alcohol, salinity, DMF, and more. Save time and increase efficiency by eliminating the need to refer to manual conversion tables.

### Cover Plate

Used to prevent interference from external light and ambient temperature during measurements.

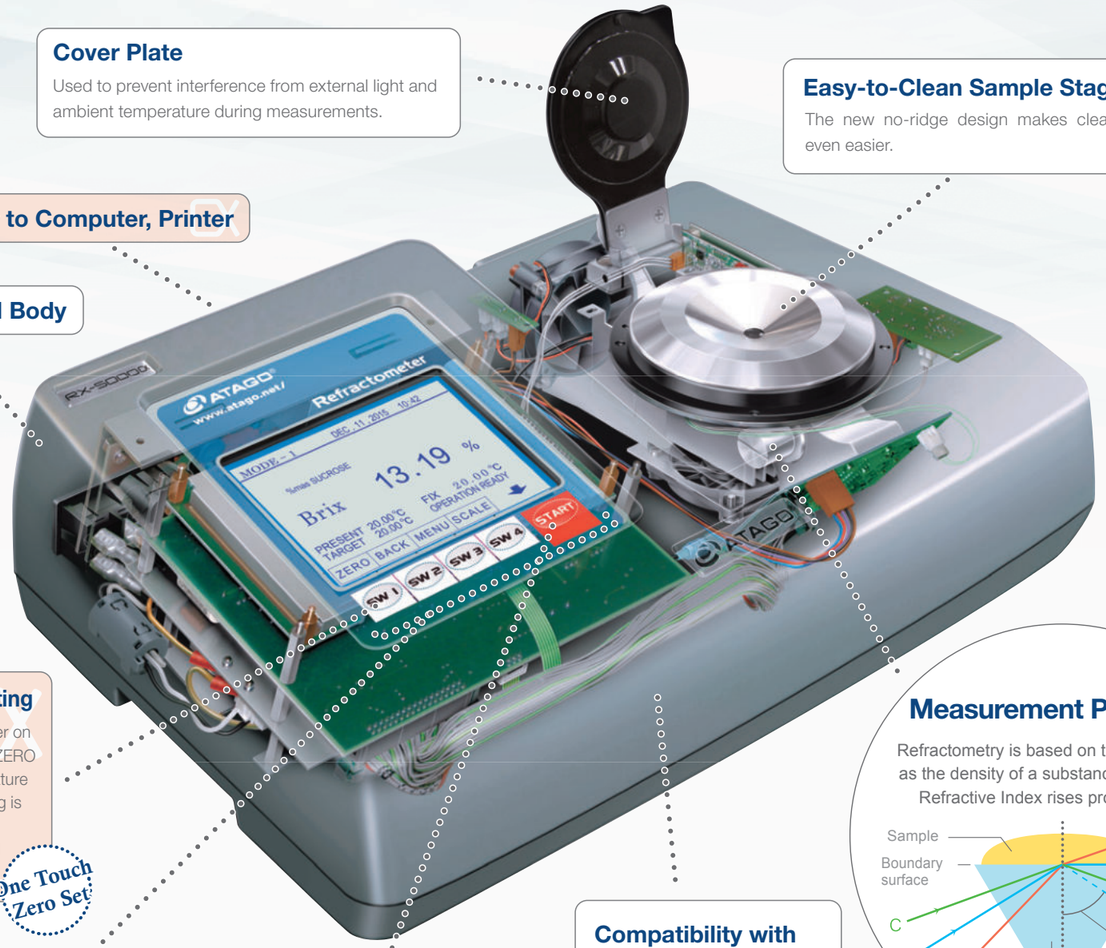
### Connectivity to Computer, Printer

### Rugged Metal Body

### Easy-to-Clean Sample Stage

The new no-ridge design makes cleaning even easier.

Fast and Easy




### No-Fuss Zero-Setting

Simply place distilled water on the prism, and press the ZERO button. Once the temperature has stabilized, zero-setting is completed within a few seconds. No complicated operations are involved.

One Touch Zero Set

### Simple Operation

General operations can be performed with just 2 buttons: START and ZERO (SW1). This allows for ultimate usability.

### Responsive, Error-Proof Design

A highly responsive design ensures every push of a button is registered, safeguarding against erroneous operations.

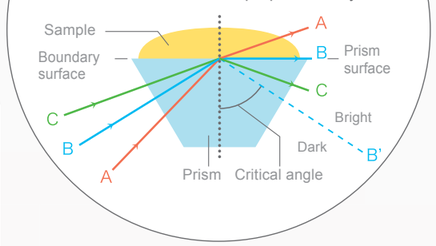
### Compatibility with Harsh Chemicals

The wetted parts can be customized with materials that are resistant to corrosive chemicals, such as acids, bases, and solvents.

P.16

### Measurement Principles

Refractometry is based on the principle that as the density of a substance increases, its Refractive Index rises proportionately.



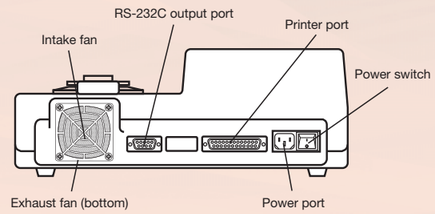

## 4 Measurement Mode Options

* excluding some products

| MODE-S * | MODE-1 | MODE-2 | MODE-3 * |
|---|---|---|---|
| For emulsion samples | For maximum accuracy | For fast results | For no temperature control |
| Displays the measurement value once a certain level of sample stability is achieved. | Displays the measurement value once the sample reaches the target temperature. | Measures Refractive Index and temperature at fixed intervals and displays the estimated measurement value at the target temperature. | Provides an option to turn the thermo-module off. Without temperature control, the measurement value is displayed in 4 seconds after the START key is pressed. |

## Printer Connectivity

GLP/GMP compliant - sample numbers, dates, time, measurement values, temperatures, and sample names (when user scales are enabled) - can be printed. Print items can be selected for customized reporting. Thermal dot or impact dot printer models available (see Accessories on page 17).




## Computer Connectivity

Transmit data to a PC via RS-232C or USB. (USB connection requires a USB to RS-232C adaptor.)
Software is available to support your FDA 21 CFR Part 11 compliance.

FDA 21 CFR Part 11 software

## Rugged Metal Body

The sturdy, yet elegant die-cast metal body protects the optical system. A special coating on the surface adds extra durability against chemicals.

## Full Selection of Accessories

See Accessories on pages 16-17.

## Calibration Certificate

A calibration certificate can be ordered with each instrument for an additional charge. Please contact your ATAGO representative for further details.

## Wide Ambient Temperature Range

The ambient temperature range of 5 to 40°C allows measurements in a wide range of temperature conditions.

# RX-α series

The world's highest standard of technology stemming from over half a century of expertise

**ATAGO's Flagship, Most Accurate and Full Range**
RX-5000α-Plus

**ATAGO's Basic Model**
RX-5000α

**Flat Sample Stage**
RX-5000α-Bev

**Wide Range, High Temperature and Accuracy**
RX-9000α

**Wide Range and High Temperature**
RX-7000α

**High Accuracy Digital Refractometer**
RX-007α

## Features

- FDA 21 CFR Part 11 Software Included in Standard Delivery.
- Measurement History
- Programmable User Scale
- Resolve Measurement Value Discrepancy
- Password Security (RX-5000α-Plus, RX-5000α, RX-5000α-Bev)
- Built-in Peltier Thermo-module

Buttons allow for operations to be performed even while wearing protective lab equipment such as gloves. General operations can be performed with just 2 buttons: START and ZERO (SW1). This simplistic, responsive design prevents erroneous operations.


**ATAGO's Flagship, Most Accurate and Full Range**
RX-5000α-Plus

Features the world's highest level of accuracy with ±0.010% for Brix and ±0.00002 for refractive index. Brix scale displays up to 3 decimal places. It's equipped with all the superb functions of the 5000α.

**ATAGO's Basic Model**
RX-5000α

Its high measurement accuracy of ±0.00004 for refractive index (nD) and ±0.03% for Brix makes it ideal for measurement of food, beverages, and sugar syrups. Capable of programming 60 kinds of user scales. Equipped with password security feature.

**Flat Sample Stage**
RX-5000α-Bev

The is ideal for measuring beverages. A flat sample stage makes it easier to wipe off the sample and allows for faster and easier clean up.

**Wide Range, High Temperature and Accuracy**
RX-9000α

The RX-9000α is a fully automatic digital refractometer with high accuracy and wide measurement range. This instrument is suitable for multiple sample types.

**Wide Range and High Temperature**
RX-7000α

Features an extremely wide refractive index range of 1.29980 to 1.71500 and capable of temperature control up to 70°C. Best suited for oils and fats with high melting points, and fragrances with high refractive index.

**High Accuracy Digital Refractometer**
RX-007α

The RX-007α is suitable for measuring water soluble samples with very low concentration (5.000% or less) at a very high accuracy of ±0.005%.

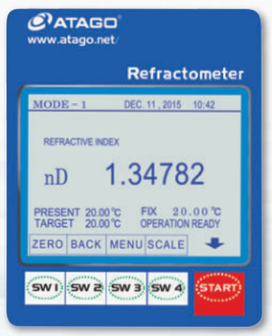
**Water Bath Connectivity**
RX-5000

The RX-5000 is not equipped with Peltier thermo-module. A water bath can be connected for temperature control.

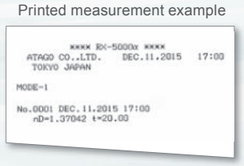
* RX-5000 specifications differ from the α series.

## Measurement value screen example (RX-5000α)

### Refractive Index

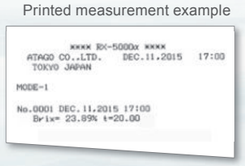



Printed measurement example

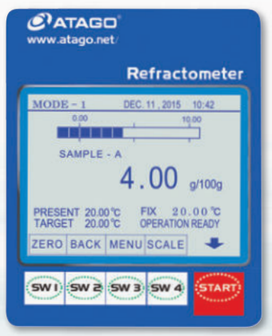



### Brix

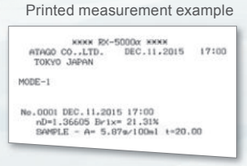

Printed measurement example




### Concentration




Printed measurement example



# Application Examples

The RX series are high quality and highly accurate automatic digital refractometers with an Internal Peltier Thermo-Module to control the sample temperature. Applications can be classified into the following three categories.

## 1. Refractive Index

Refractive Index is a common quality standard measure for pharmaceutical or chemical products. Measurements need to be taken at a constant temperature, commonly 20°C, 25°C, and 40°C. The RX series units are equipped with the internal Peltier Thermo-Module, and measurement starts once the target temperature is reached.

### Fragrance and Food Additives

Fragrance and food additives are required to have certain Refractive Index. It is also used to identify unknown fragrances.

### Pharmaceutical Products

Some pharmacies utilize Refractive Index standards. The Refractive Index of pharmaceutical products is measured for quality assurance purposes. Refractive Index of intravenous medications is also measured to control the concentration.

### Cosmetics

The Refractive Index of petroleum and other base ingredients for cosmetics are measured for quality control. The Refractive Index of some components affects the cosmetics' ability to make the skin shine, so refractive Index measurements are commonly performed.

### Petroleum and Organic Solutions

Standards are set for the Refractive Index of some refined petroleum products and organic chemicals.

### Oils and Fats

The Refractive Index of unprocessed plant oil is regulated by many governmental standards. Refractive Index measurements are crucial for quality assurance of animal-based oils as well.

### Detergents

The amount of impurities contained in hydrocarbon-based detergents can be calculated by the Refractive Index. The Refractive Index of glycol ether-based and water-based detergents is also measured.



## 2. Brix

Brix is measured for quality control purposes in the food and beverage industries. The RX series units are widely used for fruit juice, condiments, jams, and honey. The RX-007α (Resolution 0.001% Brix) is used for tea and unsweetened drinks.

### Beverages and Fruit Juice

The Brix of dairy based beverages, soft drinks, and natural fruit juice is tested throughout the production process for quality control. The RX-5000i-Plus and the RX-5000α-Plus are ideal for measurements that require a high accuracy level. The RX-007α is a specialized model for tea and unsweetened drinks.

### Jams, Honey, Liquid Sugar, Syrups

The measurements to determine the sugar content are absolutely essential, and refractometers are commonly used. The RX series are ideal for measuring viscous samples.

### Condiments, Sauces, Soups

Refractometers are used to control the concentration of ketchup, sauces, and soups. The RX series provide precise measurements for these types of samples.

## 3. Concentration

The concentrations of industrial solutions are often monitored. Examples include water-based cutting oils and cleaning solutions, hydrogen peroxide, coolants, and alcohol solutions. Although the Brix scale is commonly used, user scales can also be programmed to display converted sample values.

### Chemical Solutions

Refractometers can quickly measure the concentrations of hydrogen peroxide, caustic soda solutions, ethyl alcohol, and dimethylformamide solutions.

### Cutting Oil and Quenching Oil

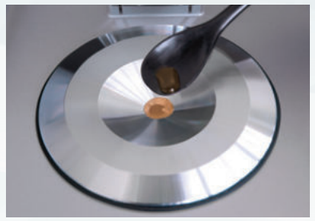
The concentrations of water-based cutting oils and quenching oils are regulated according to the purpose. Oils that are not at the correct concentrations negatively affect the quality of the finished products and the lifetime of the machining tools.

### Antifreeze and Coolants

The concentration of automotive coolants and coolants used in freezers and pipes of central air conditioning systems need to be checked for the concentration to determine the freezing point.

# Measurement Method

The RX series is designed for extremely easy and simple uses.
Simple operation without compromising the accuracy level.



Place a sample on the prism.

**RX-i series:** Touch START to start a measurement.

**RX-α series:** Press the START key to start a measurement.

Wipe off the sample to clean.

# Sample Measurement Example

* Refractive index and Brix are reference values subject to change depending on the process, such as manufacturing or cooking.

### [Eye drop] Tocopherol: RI 1.503 to 1.507

One drop dispensed from a bottle is approximately 0.05ml, of which 0.02ml actually stays in the eye. The most effective way of administrating is to keep the eye closed for about two minutes after eye drop is applied.

### [Facial masks] Glycerin: RI 1.4740

Cream forms a moisturizing membrane for the skin. Ingredients vary from mud, seaweed, oils, cucumber, bran, aloe, lemon, sake lees, honey, molasses, flour, and even bush warblers' droppings.

### [Soap] Soap: Brix 24.12%

Soap may have been first discovered when ancient people noticed that their hands were cleaner when washed with a mixture of wood ashes and fats of animals.

### [Japanese beef bowl] Sauce: Brix 13.7%

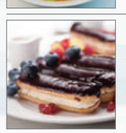
The custom of eating beef was introduced to Japanese by the influx of Western culture after the war. The dish used to be called "kamechabu," stemming from a combination of rice topped with beef broth. "Gyudon" (beef rice bowl) is said to have originated in 1862 from the establishment of a "gyunabeya" (a beef hotpot restaurant).

### [Japanese tempura bowl] Sauce: Brix 23.4%

After World War II, then Supreme Allied Commander was served tempura. Since then, tempura is a well-known and popular Japanese dish worldwide. The cooking technique may have been introduced by Chinese in the Tang Dynasty era in about 8th century.

### [Ramen] Soup: Brix 4.6%

Noodles of Chinese origin, ramen have become a Japanese cultural icon. It is characterized by the wavy noodles and soy sauce-based soup.

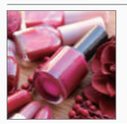


### [Éclair] Chocolate: Brix 77.5%

The name means "lightning" in French because either the cracks on the pastry surface resemble lightning, or it is consumed at lightning speed.

### [Anti-itch Medications] Diphenhydramine: RI approx. 1.55

Itching of skin is associated with inspect bites and stings, hives, allergic reactions, eczema, contact dermatitis, fungal, etc.



### [Nail polish] Acetone: RI 1.3590

In Japan, safflower and rose balsam were commonly used to paint nails in old times. Colored nail enamels were introduced around 1930, inspired by fast-drying automobile paints.

### [Dishwashing detergent] Detergent: Brix 33.26%

Recently, detergents are developed to be not only tough on grease but also gentle and moisturizing for the skin. Most dishwashing detergents are neutral and contain plant-based ingredients, such as corn oil, coconut oil, palm oil, sunflower oil, etc.

### [Seafood salad] Asian salad dressing: Brix 12.0%

This healthy salad is a mixture of seafood, such as octopus, shrimp, clams, and vegetables. A great source of vitamins.

### [Caesar salad] Caesar vinaigrette: Brix 21.2%

An Italian-born Mexican chef, Caesar Cardini created this classic salad at his hotel restaurant in Tijuana.

### [Shark fin soup] Soup: Brix 5.1%

Japan is a supplier of shark fin. Shark fin, along with sea cucumbers and abalones, were exported to China in 1600's.

### [Mitarashi dango] Sauce: Brix 48.7%

Mitarashi dango is a Japanese dumpling made from rice flour. 3 to 5 pieces are skewered, charcoal-grilled, and covered with syrup made from soy sauce, sugar, and starch. It was originally served as an offering to gods at shrine festivals in the city of Kyoto.



# End User Feedback

## Inspection : Vegetable oil manufacturer

The Refractive Index of vegetable oil is listed in JAS (Japan Agricultural Standard) and therefore is an important value to check within quality control. We switched from an Abbe refractometer to the RX-7000α after we evaluated a demo unit to check the consistency of the readings. We were very satisfied with the speed and performance of the instrument, and the quality of the customer service. **We are also happy to know that loaner units are available free of charge when our instrument is out for regular maintenance.**

## QC : Pharmaceutical manufacturer

We are using the RX-5000α to check the concentration of solutions. Compared to other analytical machines, the features that appeal to us are: only a small amount of sample is required, a measurement value is displayed quickly, and no sample preparation prior to measurement is required. **We appreciate ATAGO's customer support when we have samples that are difficult to measure or receive unexpected measurement results.**

## R&D : Beverage manufacturer

**We have been using ATAGO products for over a decade.** We currently use a RX-007α for unsweetened drinks, such as green and red teas, and three RX-5000α for regular drinks. It gives us peace of mind knowing that all ATAGO instruments are manufactured by the same company. More and more customers choose beverages based on the calories and ingredients. Brix measurements play an essential role in our product development.

## Testing : Food manufacturer

Recently, with food safety issues becoming a focus of attention, we as manufacturers are required to adhere to stricter quality control standards by implementing such standards as HACCP and ISO22000. **We are using the RX-5000α as the high accuracy master unit for inspections of our final products.** We always appreciate the quick and courteous customer service when we need to request a loaner unit during maintenance or when purchasing a new replacement unit.

## Condiments and Vegetable Juice Inspection Association

We perform JAS (Japan Agricultural Standard) authorized inspections of tomato products, sauces, vinegars, carrot juice, and other juices that contain carrot juice. Food manufacturers from all over the country send us samples of their products for testing. In these times, where food safety is critical, the RX-5000α acts as a **trustworthy intermediary between food manufacturers and customers.** We are very satisfied with the unit's simple operation without having to compromise on accuracy.

ATAGO RX series are also used at laboratories of the following food testing associations:

- **Food Environment Inspection Association**
- **Japan Oil and Fat Inspection Association**
- **Japan Juice Association Corporation**

# Accessories

## ☐ Sucrose Solution (calibration certificate optional)

Regular inspection of the RX series unit is highly recommended. Use one of the following solutions to confirm the calibration.

<High Accuracy - RX series - (excluding RX-007α)>

[RE-111001] 10% sucrose solution (±0.01%)
[RE-112001] 20% sucrose solution (±0.01%)
[RE-113001] 30% sucrose solution (±0.01%)
[RE-114002] 40% sucrose solution (±0.02%)
[RE-115002] 50% sucrose solution (±0.02%)

* Shelf life for these solutions is 10 days.


<Low concentration - RX series ->

[RE-110250] 0.25% sucrose solution (±0.005%)
[RE-110500] 0.50% sucrose solution (±0.005%)
[RE-111000] 1.00% sucrose solution (±0.005%)

* Shelf life for these solutions is 6 weeks.

<Custom Concentrations>

Custom concentrations are available upon request.
Accuracy and prices will vary by concentration.
Contact ATAGO for more details.

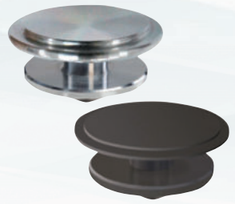
## ☐ Fan Filter Replacement

Regular cleaning of the fan filter is highly recommended to maintain the optimum performance level of the RX series.

[RE-58001] Fan filter replacement (a set of 12)

## ☐ MAGIC™

Used for measuring volatile substances.
Choose either metal or resin.



[RE-56180] MAGIC™ (Metal)
[RE-56185] MAGIC™ (Resin)

## ☐ Funnel-type Flow Cell

Save time with the flow cell! No need to clean the prism between measurements.

[RE-56172]
RX-5000i, -5000i-Plus, -5000α, -5000α-Plus

[RE-56173]
RX-7000i, -9000i, -7000α, -9000α

* Custom nozzle diameters are available upon request. Contact ATAGO for more details.

## ☐ Key Cover

Prevent accidental system changes by covering all but the START and ZERO keys.

[RE-58120] Key Cover

# Digital Printers

Automatically prints out sample number, refractive index (nD), Brix (%), user scales, and measurement temperature (℃) after each measurement.

## ☐ Digital Printer DP-63

For printing on thermal paper.

### DP-63 Cat.No.3118

Printing method : Thermal dot
Power supply : AC adaptor (AC100V)
Power consumption : 13VA
Dimensions & weight : 17×16×7cm, 580g (main unit only)

## ☐ Digital Printer DP-AD

For printing on regular paper.

### DP-AD Cat.No.3123

Printing method : Dot impact
Power supply : AC adaptor (AC100V)
Power consumption : 7VA
Dimensions & weight : 11×18×9cm, 470g (main unit only)

## ☐ Digital Printer DP-RX

For printing on thermal paper.

### DP-RX Cat.No.3121

Printing method : Thermal dot
Power supply : AC adaptor (AC100V)
Power consumption : 13VA
Dimensions & weight : 17×16×7cm, 580g (main unit only)

## ☐ Digital Printer DP-RD

For printing on regular paper.

### DP-RD Cat.No.3122

Printing method : Dot impact
Power supply : AC adaptor (AC100V)
Power consumption : 7VA
Dimensions & weight : 11×18×9cm, 470g (main unit only)

### Sample print

*Paper size & dimensions may differ, but the printed content is the same.

- DP-63
- DP-RX

```
**** RX-7000α ****
ATAGO CO.,LTD.    DEC.11,2016   12:00
TOKYO JAPAN

MODE-1

No.0001 DEC.11,2016 12:00
   nD=1.34838 Brix=  10.36% t=20.00
```

- DP-AD
- DP-RD

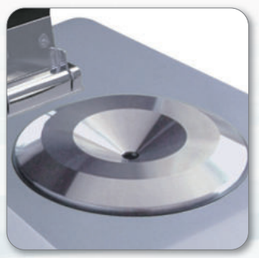
```
**** RX-7000α ****
ATAGO CO.,LTD.    DEC.11,2016   12:00
TOKYO JAPAN

MODE-1

No.0001 DEC.11,2016 12:00
   nD=1.34838 Brix=  10.36% t=20.00
```

# Customizable Compatibility with harsh chemicals

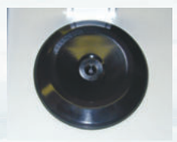
The wetted parts can be customized with materials that are resistant to corrosive chemicals, such as acids, bases, and solvents.



## Sample stage

- Special coatings (PEEK, PTFE, etc.)
- Custom materials (Corrosion-resistant metal alloys)

<Example>



PTFE

PEEK

## Body case

- Special coatings (PEEK, PTFE, etc.)

<Example>

PEEK

## Cover plate

- Custom materials (PVC resin, fluorine resin, etc.)

# RX Series Specifications List



| | | ATAGO's Flagship, Most Accurate and Full Range | ATAGO's Flagship, Most Accurate and Full Range | ATAGO's Basic Model |
|---|---|---|---|---|
| Model | | RX-5000i-Plus | RX-5000α-Plus | RX-5000i |
| Cat.No. | | 3275 | 3266 | 3276 |
| Measurement system | | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system |
| Measurement Range | Refractive index | (nD) 1.32420 to 1.58000 | (nD) 1.32700 to 1.58000 | (nD) 1.32420 to 1.58000 |
| | Brix | 0.000 to 100.000% (Automatic Temperature Compensation) | 0.000 to 100.000% (Automatic Temperature Compensation) | 0.00 to 100.00% (Automatic Temperature Compensation) |
| | User scale | 100 | 60 | 100 |
| Resolution | Refractive index | (nD) 0.00001 | (nD) 0.00001 | (nD) 0.00001 |
| | Brix | 0.001% | 0.005% | 0.01% |
| | Temperature | 0.01°C | 0.01°C | 0.01°C |
| Measurement Accuracy | Refractive index | (nD) ±0.00002 | (nD) ±0.00002 | (nD) ±0.00004 |
| | Brix | ±0.010% | ±0.010% | ±0.03% |
| | Temperature | ±0.05°C | ±0.05°C | ±0.05°C |
| Mode | | MODE-S, 1, 2, 3, T | MODE-S, 1, 2, 3 | MODE-S, 1, 2, 3 |
| Temperature control range | | 5.00 to 75.00°C (No lower than 10°C below or higher than 55°C above the ambient temperature) | 5.00 to 60.00°C (Lowest is ambient temp -10°C) | 5.00 to 75.00°C (No lower than 10°C below or higher than 55°C above the ambient temperature) |
| Environmental operating conditions | | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level |
| Display method | | 7.5-inch color LCD + touch screen | LCD with illuminating backlight | 7.5-inch color LCD + touch screen |
| Output | | Computer - USB, Printer and PC (via RS-232C) | Printer and PC (via RS-232C) | Computer - USB, Printer and PC (via RS-232C) |
| Light source | | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) |
| Materials | Prism | Synthetic sapphire | Synthetic sapphire | Synthetic sapphire |
| | Sample stage | SUS316 | SUS316 | SUS316 |
| Power supply | | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz |
| Power Consumption | | 90VA | 65VA | 90VA |
| Dimensions and weight | | 37×26×14cm, 6.6kg (main unit only) | 37×26×14cm, 6.4kg (main unit only) | 37×26×14cm, 6.6kg (main unit only) |



| | | Wide Range and High Accuracy | Wide Range, High Temperature and Accuracy | Wide Range |
|---|---|---|---|---|
| Model | | RX-9000i | RX-9000α | RX-7000i |
| Cat.No. | | 3278 | 3263 | 3279 |
| Measurement system | | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system |
| Measurement Range | Refractive index | (nD) 1.29980 to 1.71500 | (nD) 1.29980 to 1.71500 | (nD) 1.29980 to 1.71500 |
| | Brix | 0.00 to 100.00% (Automatic Temperature Compensation) | 0.00 to 100.00% (Automatic Temperature Compensation) | 0.00 to 100.00% (Automatic Temperature Compensation) |
| | User scale | 100 | 30 | 100 |
| Resolution | Refractive index | (nD) 0.00001 | (nD) 0.00001 | (nD) 0.00001 (Factory default setting 0.0001) |
| | Brix | 0.01% | 0.01% | 0.01% (Factory default setting 0.1%) |
| | Temperature | 0.01°C | 0.01°C | 0.01°C |
| Measurement Accuracy | Refractive index | (nD) ±0.00004 | (nD) ±0.00004 | (nD) ±0.0001 |
| | Brix | ±0.03% | ±0.03% | ±0.1% |
| | Brix | ±0.05% | ±0.05% | —— |
| | Temperature | ±0.05°C | ±0.05°C | ±0.05°C |
| Mode | | MODE-S, 1, 2, 3 | MODE-S, 1, 2, 3 | MODE-S, 1, 2, 3 |
| Temperature control range | | 5.00 to 75.00°C (No lower than 10°C below or higher than 55°C above the ambient temperature) | 5.00 to 70.00°C (Lowest is ambient temp -10°C) | 5.00 to 75.00°C (No lower than 10°C below or higher than 55°C above the ambient temperature) |
| Environmental operating conditions | | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level |
| Display method | | 7.5-inch color LCD + touch screen | LCD with illuminating backlight | 7.5-inch color LCD + touch screen |
| Output | | Computer - USB, Printer and PC (via RS-232C) | Printer and PC (via RS-232C) | Computer - USB, Printer and PC (via RS-232C) |
| Light source | | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) |
| Materials | Prism | Synthetic sapphire | Synthetic sapphire | Synthetic sapphire |
| | Sample stage | SUS316 | SUS316 | SUS316 |
| Power supply | | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz |
| Power Consumption | | 90VA | 65VA | 90VA |
| Dimensions and weight | | 37×26×14cm, 7.0kg (main unit only) | 37×26×14cm, 6.8kg (main unit only) | 37×26×14cm, 7.0kg (main unit only) |





| | | ATAGO's Basic Model | Flat Sample Stage | High Accuracy Digital Refractometer |
|---|---|---|---|---|
| Model | | RX-5000α | RX-5000α-Bev | RX-007α |
| Cat.No. | | 3261 | 3271 | 3921 |
| Measurement system | | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system |
| Measurement Range | Refractive index | (nD) 1.32700 to 1.58000 | (nD) 1.32700 to 1.58000 | (RI) 1.330150 to 1.341500 |
| | Brix | 0.00 to 100.00% (Automatic Temperature Compensation) | 0.00 to 100.00% (Automatic Temperature Compensation) | 0.000 to 5.000% (Automatic Temperature Compensation) |
| | User scale | 60 | 60 | 30 |
| Resolution | Refractive index | (nD) 0.00001 | (nD) 0.00001 | (RI) 0.000001 |
| | Brix | 0.01% | 0.01% | 0.001% |
| | Temperature | 0.01°C | 0.01°C | 0.01°C |
| Measurement Accuracy | Refractive index | (nD) ±0.00004 | (nD) ±0.00004 | (RI) ±0.000010 (to 20°C) |
| | Brix | ±0.03% | ±0.03% | ±0.005% (Ambient temperature and temperature compensation conditions apply) |
| | Temperature | ±0.05°C | ±0.05°C | ±0.05°C |
| Mode | | MODE-S, 1, 2, 3 | MODE-S, 1, 2, 3 | MODE-1, 2 |
| Temperature control range | | 5.00 to 60.00°C (Lowest is ambient temp -10°C) | 5.00 to 60.00°C (Lowest is ambient temp -10°C) | 10.00 to 40.00°C (Lowest is ambient temp -5°C) |
| Environmental operating conditions | | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level |
| Display method | | LCD with illuminating backlight | LCD with illuminating backlight | LCD with illuminating backlight |
| Output | | Printer and PC (via RS-232C) | Printer and PC (via RS-232C) | Printer and PC (via RS-232C) |
| Light source | | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) |
| Materials | Prism | Synthetic sapphire | Synthetic sapphire | Optical glass |
| | Sample stage | SUS316 | SUS316 | SUS316 |
| Power supply | | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz |
| Power Consumption | | 65VA | 65VA | 65VA |
| Dimensions and weight | | 37×26×14cm, 6.4kg (main unit only) | 37×26×14cm, 6.1kg (main unit only) | 37×26×14cm, 6.7kg (main unit only) |


| | | Wide Range and High Temperature | Water Bath Connectivity |
|---|---|---|---|
| Model | | RX-7000α | RX-5000 |
| Cat.No. | | 3262 | 3281 |
| Measurement system | | Optical-refraction critical-angle detection system | Optical-refraction critical-angle detection system |
| Measurement Range | Refractive index | (nD) 1.29980 to 1.71500 | (nD) 1.32700 to 1.58000 |
| | Brix | 0.00 to 100.00% (Automatic Temperature Compensation) | 0.00 to 100.00% (Automatic Temperature Compensation) |
| | User scale | 30 | 5 |
| Resolution | Refractive index | (nD) 0.00001 (Factory default setting 0.0001) | (nD) 0.00001 |
| | Brix | 0.01% (Factory default setting 0.1%) | 0.01% |
| | Temperature | 0.01°C | —— |
| Measurement Accuracy | Refractive index | (nD) ±0.0001 | (nD) ±0.00004 |
| | Brix | ±0.1% | ±0.03% |
| | Temperature | ±0.05°C | —— |
| Mode | | MODE-S, 1, 2, 3 | —— |
| Temperature control range | | 5.00 to 70.00°C (Lowest is ambient temp -10°C) | 5.00 to 60.00°C |
| Environmental operating conditions | | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level |
| Display method | | LCD with illuminating backlight | LCD with illuminating backlight |
| Output | | Printer and PC (via RS-232C) | Printer and PC (via RS-232C) |
| Light source | | LED (Approximating to D-Line wavelength) | LED (Approximating to D-Line wavelength) |
| Materials | Prism | Synthetic sapphire | Synthetic sapphire |
| | Sample stage | SUS316 | SUS316 |
| Power supply | | AC100 to 240V 50/60Hz | AC100 to 240V 50/60Hz |
| Power Consumption | | 65VA | 30VA |
| Dimensions and weight | | 37×26×14cm, 6.8kg (main unit only) | 37×26×14cm, 6.4kg (main unit only) |