

Presence of Those Who Have Reached the Summit

Digital Refractometers

RX- α series



The World's Highest Standard of Technology
Stemming from Over Half a Century of Expertise

RX-5000X / RX-5000X-Plus / RX-5000X-Bev
RX-7000X / RX-9000X / RX-007X



A Wide Selection to Meet Every Measurement Need

Most Accurate and Full Range RX-5000X-Plus

The **world's highest level of accuracy**
Brix: $\pm 0.010\%$, Refractive Index: ± 0.00002
Brix value displayed to the 3rd decimal place



Hygienic Flat Sample Stage RX-5000X-Bev

Developed with the **beverage** industry in mind
Easy-to-clean **flat** sample stage
Quickly measure a sample after another



Wide Range and High Temperature RX-7000X

Ideal for high Refractive Index samples
- Fragrances, organic solvents, etc.
A **wide** Refractive Index range: 1.3250-1.7000 with
Automatic Temperature Compensation up to 70°C



Wide Range, High Temperature, and Accuracy RX-9000X

Equipped with the accuracy of the RX-5000 α combined with **the wide Refractive Index** range and **temperature control** of the RX-7000 α for a wide variety of applications



World's No.1 Accuracy RX-0070X

For low viscosity samples less than 5% Brix
World's highest accuracy $\pm 0.005\%$ Brix
Manage the concentrations of low-Brix industrial solutions - Surfactants, anti-rust coatings, heavy water, liquid glass, etc.



Beautiful, Functional Design. User - Tested Ease of Use.
True Quality Never Becomes Obsolete. It Only Gets Better with Time.

World's Highest Standard of Accuracy

The RX series are the most accurate of ATAGO refractometers programmed with a trusted and advanced algorithm. The epitome of which boasts the accuracy of ± 0.000010 nD and $\pm 0.005\%$ Brix.

Ergonomically Designed Layout

The RX- α series was designed with ease of use in mind. Extensive research was performed in the design phase to ensure an ergonomic interface that made operation easy while maximizing efficiency.

Cover Plate

Used to prevent interference from external light and ambient temperature during measurements. There is **no need to clean** the cover plate as it does not come in contact with the sample.

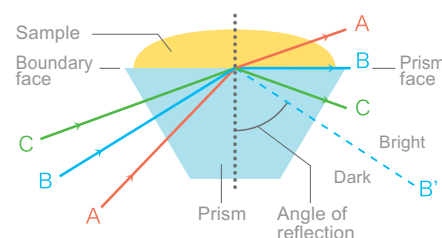
Easy-to-Clean Sample Stage

The **new no-ridge design** makes cleaning even easier.

Fast
and
Easy

Measurement Principles

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



RX-S0000X



Simple Operation

General operations can be performed with **only two buttons** - ultimate usability.

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.

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

Printer Connectivity

GLP/GMP compliant - sample numbers, dates, time, settings, 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 9).

Computer Connectivity

Transmit data to a PC via RS-232C or USB. (USB connection requires a USB to RS-232C adaptor.) Data transmission software is also available for **direct data output to Excel** (see Accessories on page 9).

Visual "Pass/Fail" Indication

Quickly identify if the measurement value is within the target range with the **graphic display**. Up to 30 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.

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.



ATAGO® RX-series														
Comd	Time	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp	Temp
1	16.02.22	70116	1558	nD	Over	Brix	Over	SALT	Over	Temp	20			
2	16.02.31	70116	1558	OUT	OF WATER									
3	16.02.48	70116	1558	nD	1.333	Brix	0	SALT	0	Temp	20			
4	16.03.07	70116	1558	ZERO	SET END									
5	16.03.14	70116	1558	ZERO	SET END									
6	16.03.20	70116	1559	nD	1.333	Brix	0	SALT	0.01	Temp	20			
7	16.05.01	70116	1559	nD	1.333	Brix	0	SALT	0.01	Temp	20			
8	16.05.09	70116	1600	ZERO	SET END									
9	16.05.15	70116	1601	nD	1.333	Brix	0.01	SALT	0.01	Temp	20			
10	16.05.30	70116	1601	nD	1.333	Brix	0	SALT	0.01	Temp	20			
11	16.06.05	70116	1601	nD	1.333	Brix	0	SALT	0.01	Temp	20			
12	16.06.12	70116	1602	ZERO	SET END									

Data transmission software



Graphic display



Measurement history

3 Measurement Modes

MODE-1 Accuracy-focused
The Internal Peltier Thermo-Module heats or cools the sample to the set target temperature before the measurement begins.

MODE-2 Speed-focused
The Internal Peltier Thermo-Module heats or cools the sample and starts collecting data to estimate the measurement value at the target temperature.

MODE-3 No.Temp Compensation
Choose whether or not to activate the Internal Peltier Thermo-Module. The measurement value is displayed within 8 seconds, or after a specified wait time.

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.

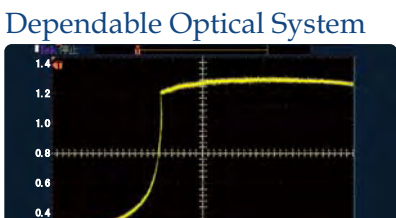
Acid and Alkaline Resistance
Specialized models for the measurement of **high alkaline** or **acidic samples** can be custom-made. Please contact ATAGO.

Large LCD
Large and easy to read 320×240 backlit LCD makes measurements easy to read.

Full Selection of Accessories
See Accessories on page 9.

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

Sturdy Sheet Switch
The durable Switch Sheet not only shields the LCD panel but also protects the operation buttons. Button operation helps **minimizes operator error** and replacement costs when needed.



Wide Ambient Temperature Range
wide range of temperature conditions.

1.888.610.7664

 www.calcert.com

sales@calcert.com

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-α series are also used at laboratories of the following food testing associations:

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

Why Choose ATAGO?

1 Proud Heritage and Experience

ATAGO has 70 years of experience in optical instrument manufacturing. With our expertise cultivated over decades, as well as an extensive

2 Industry-Leading Technology

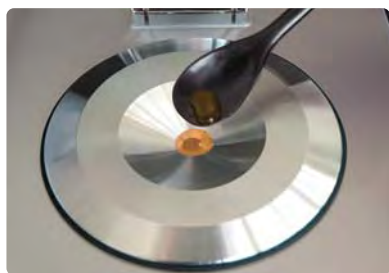
Refraction of light has been our sole specialty throughout the existence of ATAGO, and we strive for perfection in optical systems. We listen to end-

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

Measurement Method

The RX- α series is designed for extremely easy and simple uses. Instruments can be operated with only two buttons - the ZERO key for zero-setting, and the START key for measurements. Simple operation without compromising the accuracy level.



Place a sample on the prism.



Press the START key to start a measurement.



Wipe off the sample to clean.

The RX- α 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- α 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



Measurement value screen



Printed measurement example

Free Demonstration Units
Available. Please contact
ATAGO Customer Service.
www.atago.net

2. Brix

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



Beverages and Fruit Juice

The Brix of dairy, fruit and soft drinks, and natural fruit juice is tested throughout the production process for quality control. The RX-5000 α -Plus is ideal for measurements that require a high accuracy level are often required. The RX-007 α 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- α series are ideal for measuring viscous samples.



Condiments, Sauces, Soups

Refractometers are used to control the concentration of ketchup, sauces, and soups. The RX- α 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.



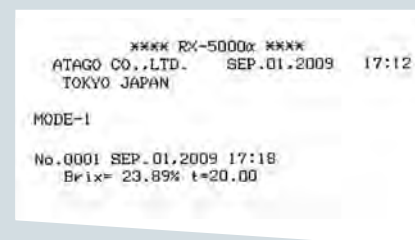
Antifreeze and Coolants

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.

User scales enable direct display of concentrations and specific gravity of various solutions. Simply program 3 data points of corresponding Refractive Index and concentration or specific gravity to automatically create a scale.



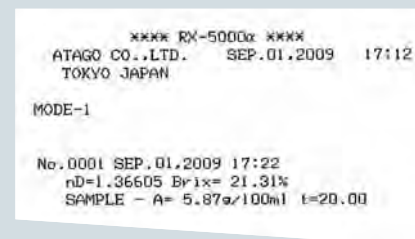
Measurement value screen



Printed measurement example



Measurement value screen



Printed measurement example

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



[Eye drop] Tocopherol: RI 1.503-1.507

One drop dispensed from a bottle is approximately 0.05ml, of which 0.02ml actually stays in the eye. The most effective way of administering 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." It originates from a rice bowl on which the broth from a beef stew was poured about 137 years ago.



[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.



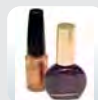
[Éclair] Chocolate: Brix 77.5%

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



[Anit-itch Medications] Diphenhydramine: RI approx. 1.55

Itching of skin is associated with insect 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, Cesar 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. 3-5 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.

Common features	Measurement system : Optical-refraction critical-angle detection system	Power supply : AC100V to 240V
	Light source : LED	Power consumption : 50/60Hz, 65VA
	Materials : Sample stage - SUS 316 Prism - Artificial sapphire (RX-007 α utilizes high density optical glass)	Environmental operating conditions : Temperature 5 to 40°C; Altitude 2,000m above sea level

Model	Measurement items and ranges	Minimum indication	Measurement accuracy ^{*repeatability}	Temperature Compensation Range	Dimensions & weight
RX-5000X-Plus (Cat.No.3266)	Refractive Index (nD) : 1.32700 to 1.58000 Brix : 0.000 to 100.000% (Automatic Temperature Compensation) User scale : 60	nD : 0.00001 Brix : 0.005% (The third decimal place is 0 or 5.) Temp : 0.01°C	nD : ±0.00002 *±0.00001 Brix : ±0.010% ※ *±0.010% Temp : ±0.05°C	5.00 to 60.00°C (Lowest is ambient temp -10°C)	37×2614cm 6.4kg (Main unit only)
RX-5000X (Cat.No.3261)	Refractive Index (nD) : 1.32700 to 1.58000 Brix : 0.00 to 100.00% (Automatic Temperature Compensation) User scale : 60	nD : 0.00001 Brix : 0.01% Temp : 0.01°C	nD : ±0.00004 *±0.00002 Brix : ±0.03% ※ *±0.01% Temp : ±0.05°C		
RX-5000X-Bev (Cat.No.3271)					
RX-7000X (Cat.No.3262)	Refractive Index (nD) : 1.32500 to 1.7000 Brix : 0.0 to 100.0% (Automatic Temperature Compensation) User scale : 30	nD : 0.0001 or 0.00001 Brix : 0.1% or 0.01% Temp : 0.01°C	nD : ±0.0001 *±0.00005 Brix : ±0.1% ※ *±0.02% Temp : ±0.05°C	5.00 to 70.00°C (Lowest is ambient temp -10°C)	37×26×14cm 6.8kg (Main unit only)
RX-9000X (Cat.No.3263)	Refractive Index (nD) : 1.32500 to 1.70000 Brix : 0.00 to 100.00% (Automatic Temperature Compensation) User scale : 30	nD : 0.00001 or 0.0001 Brix : 0.01% Temp : 0.01°C	nD : ±0.00004 *±0.00002※※ Brix : ±0.03% *±0.01%※※※ Brix : ±0.05% *±0.01%※※※※ Temp : ±0.05°C		
RX-007X (Cat.No.3921)	Refractive Index (RI) : 1.330150 to 1.341500 Brix : 0.000 to 5.000% (Automatic Temperature Compensation) User scale : 30	RI : 0.000001 Brix : 0.001% Temp : 0.01°C	RI : 0.000010 (at 20°C) Brix : ±0.005% (Ambient temperature and temperature compensation conditions apply)	15.00 to 30.00°C	37×26×14cm 6.7kg (Main unit only)

※Measurement of sucrose solution by MODE-1. ※※When nD 1.33299 to 1.42009, 10 to 30°C. For other ranges, nD ± 0.00010 * ± 0.00005 .

※※※When Brix 0.00 to 50.00%, 10.00 to 30.00°C. ※※※※When Brix 50.01 to 95.00%, 10.00 to 30.00°C. For other ranges, Brix $\pm 0.10\%$ * $\pm 0.10\%$.

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 opening of ATAGO U.S.A. in Bellevue, WA in July 2002 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. The two most recent developments are the openings of ATAGO ITALIA s.r.l. in October of 2010 and ATAGO CHINA Guangzhou Co., Ltd. in March of 2011. While we have long enjoyed market presence domestically in Japan, our service to the global market is becoming increasingly important.

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

As new regulations and requirements are imposed in the marketplace, the competition is expected to become fiercer. Being true to our mission statement: "Create and Advance in Consonance," 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 in 2007 and 2008.

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 Itabashi revenue office for the tax honesty, stable profitability, and transparent business model in 2002 and 2007.



Tokyo Trial Purchase Program

The "MASTER" hand-held refractometer series was selected by the Tokyo Trial Purchase Program 2009. Through this program, Tokyo Metropolis experimentally purchases reputable and cutting-edge products and provides marketing support to the local small and mid-size manufacturers.



All ATAGO refractometers are designed and manufactured in Japan.

HACCP GMP GLP

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

ATAGO CO., LTD.



* Specifications and appearance are subject to change without notice.

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