

# Reasons to choose the MASTER

## Water Resistant



The concept of a washable hand-held analog unit is exceptional. After measuring, the instrument can be cleaned with running water under a faucet. The new structural-design of these units allows them to be washed whenever necessary. Rated IP65 (dust tight and water resistant).

## α·H



The world's first feature

## Durability



The MASTER series has passed all water resistance, dust resistance, and drop tests. Instruments were subjected to water jets from four directions, dropped from a height of one meter onto an oak platform, and withstood the pressure changes of air travel.

## Calibration



The α and H types can now be calibrated with the new waterproof calibration screw. All MASTER models can be calibrated by end-user.

## Hygienic Design



The MASTER series was also designed with a smooth and easy-to-clean grip, eliminating the possibility of food and samples being trapped which can result in contamination and bacterial growth.

## Visibility



Efficiently using an analog unit depends on how easily the measured value can be read. Extensive research and the use of quality optics result in a measurement scale that is very bright, creating a high contrast to see clearly where the boundary intersects the memory lines of the scale.

## Automatic Temperature Compensation (ATC)

## α·T·H



The newly designed ATC system allows the MASTER series to read more accurately than any comparable unit. ATAGO has applied for a patent on the design of the improved ATC system. The MASTER series reads more accurately than any comparable unit in the market.

## Reputation for Quality



ATAGO has built a firm reputation for reliability and quality during its over 70 years history. We are a strong company that exports to over 154 countries with continued growth expectations. ISO 9001 certified, along with our integrated system for producing and marketing our products, based on the "Plan-Do-Check-Act" cycle, is essential to the continued quality and to the promoting of the ATAGO name.

# Simple Operation



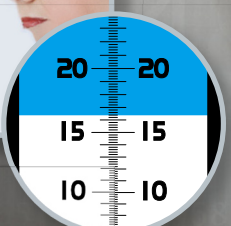
1 Apply 1-2 drops onto the prism.



2 Close the daylight plate. View the scale through the eyepiece.



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



## Applications

-Measuring sugar concentration, concentration, Brix and Refractive Index-

### Honey



Honey

### Jam, Syrup



Jam, syrup, confectioneries

### Soy milk



Soy milk

### Condiments



Condiment, seasonings, ketchup, various sauces, soy sauce

### Wine



Grapes, wine must

### Drink



Fruit juice, soft drink, carbonated beverage

### Cooking



Chinese noodle soup, various soup, various sauces

### Agriculture



Fruit and vegetable juice, leaf juice, stem juice, root juice

### Salinity



Sodium chloride solution, sea water, pickles

### Machine Tools



Firefighting foam, soluble cutting oil

### Chemicals and medicine



Brine, deicing solution, medicine, chemical, cosmetics, cleaning solution

### Clinical



Urine, serum

## Optional Accessories



**Small Volume Daylight Plate With Hinge Pin**  
For metal body model  
Parts.No. RE-2311-58M  
For plastic body model  
Parts.No. RE-2391-50M



**Super Extractor**  
Parts.No. RE-29401



**Sucrose solution (for Brix confirmation)**  
Parts.No. RE-110010 10% Sucrose  
Parts.No. RE-110020 20% Sucrose  
Parts.No. RE-110030 30% Sucrose  
Parts.No. RE-110040 40% Sucrose  
Parts.No. RE-110050 50% Sucrose  
Parts.No. RE-110060 60% Sucrose

All ATAGO refractometers are designed and manufactured in Japan.

**HACCP GMP GLP**

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

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**About the Trade Mark:**  
Year 2005 ATAGO was established 65 years ago and we have been developing, manufacturing, and marketing Refractometers based on our in-depth study of optics. This year we have released our NEW Hand-Held Refractometer series, the "MASTER" to support and meet our customer's needs. The NEW "MASTER" series is a fitting name to match its ultimate performance. The trade mark "At" is the Japanese Kanji which means "light". The decision to use this Kanji as a trade mark for the MASTER series is to emphasize that this product was designed and manufactured in Japan. With the multitude of imitation products out in the market today, ATAGO is maintaining our identity as the master of manufacturing quality instruments. We, ATAGO, would like to be your business partner and to be the "light" to continue towards a bright future together.



Hand-held Refractometer

Design Registration No. 000379326-0001, 000379326-0002 (EU)  
ZL 2005 3 0116403.4.S (China), D111526 (Taiwan), D555, 549 (U.S.A.),  
1255763, 1255764, 1255765, 1255766, 1255767 (Japan)  
Patent Granted in countries around the world.



# MASTER series

Choose the right model for your sample, based on the features and materials of the instrument.



## Material 2 types

Choose either metal or plastic.



### Metal

#### Die-cast aluminum

Ideal for the agriculture industry, metal working fluids, and various high-temperature samples. Resistant to organic solvents.



### Plastic

#### PBT (polybutylene terephthalate)

Resistant to salty and acidic samples.

## Features 4 types

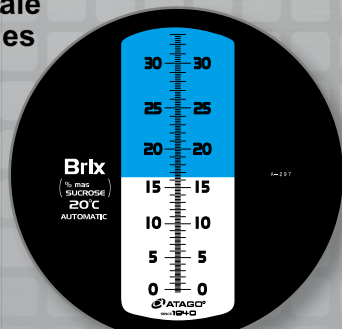
Both the α and T types are equipped with the Automatic Temperature Compensation feature. Choose the type H for the added feature of IP 65 water-resistance. The H type is the heat-resistant version of the type.

Series	α	T	M	H
Water resistant	●	—	—	●
Automatic temperature compensation	●	●	—	●
Heat resistant	—	—	—	●
Calibration	● <b>NEW</b>	●	●	● <b>NEW</b>

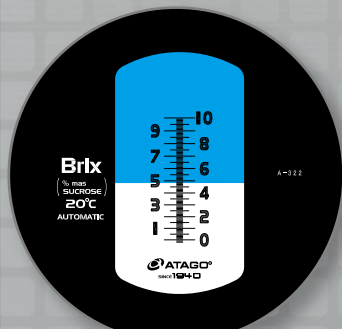
## Scale Brix or other special scales

Custom scales are available upon request.

### Brix scale examples

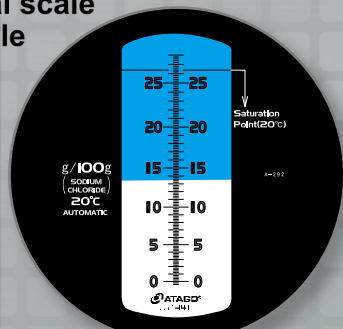


MASTER-α  
Brix 0 ~ 33%



MASTER-10α  
Brix 0 ~ 10%

### Special scale example



MASTER-S28α

## Understanding model names

A model name consists of the scale (sample name), material, and feature type.

### Brix Scale

## MASTER-

## 2

## P

## α

#### Example Measuring sauces

- Sample information
- About 40% Brix (see A in chart below)
  - Salty
  - Oily

Scale  
↑  
Choose **2** **28-62%** (see B in chart below).

Material  
↑  
Choose the salt-resistant **P** plastic body.

Metal ... Blank  
Plastic ...

Features  
↑  
Choose the washable type for easy cleaning.  
Choose **α**

### Special Scale

## MASTER-

## S28

## α

#### Example Measuring brine

- Sample information
- Salty
  - Running/standing water around
  - High in salt concentration

Scale  
↑  
Choose the corrosion-resistant **P** plastic body with a **wide-range salinity scale**.

Features  
↑  
Choose the water-resistant type for safe handling in an environment where running/standing water is readily available.  
Choose **α**

## Brix of Various Samples Refractive index and Brix of various types of samples

Brix (%)	Food industry	Chemical industry	Medical Science industry	Memory (Brix) □ = Memory No.
(Ri)				
1.333	<b>0</b> <b>Drinks</b>	<b>Water</b>	Methanol Saline Aloe extract Sea water	(1) 10 20 53 0 0 0 0 33 10 20 53 % % % %
1.34	<b>5</b> Beer <b>Fruits / Vegetables</b> Miso soup <b>Seasonings</b>	Nickel plate liquid	Chlorella extract	
	Coffee Soy milk Cola Milk	Gelatin liquid	Serum	
1.35	<b>10</b> Orange Apple Prince melon	Freon113		
	Beef curry Demiglace (sauce) Orange jelly			
1.36	<b>15</b> Lactic acid-bacteria beverage	Silicone solution (emulsion)	Acetone Ethanol	
1.37	<b>20</b> Canned syrup	Electrolyte Freon 11	Acetic acid	
1.38	<b>30</b> Ketchup	Acrylonitrile	Saturated saline	2 28 62 %
1.39	<b>40</b> Soy sauce Sauce			
1.40	<b>40</b> Low-sugar jam	Silicone oil	Octane	4 45 82 %
	<b>50</b> Egg yolk	Ethylene glycol Propylene glycol		
	<b>60</b> Butter			
	<b>70</b> Olive oil			
	<b>80</b> Honey Jam	Diesel oil Ricinus	Glycerin	3 58 90 %
	<b>80</b> Honey Starch Syrup	Polyvinyl chloride (PCV) Styrene Asphalt		
1.50	<b>90</b>			

## Specifications

### Brix Scale

Range (Minimum)	Series	α		T		M	
	Material	Metal	Plastic	Metal	Plastic	Metal	Plastic
	Model	MASTER-α	MASTER-Pα	MASTER-T	MASTER-PT	MASTER-M	MASTER-PM
(1) 0 ~ 33% (0.2%)	Cat.No.	2311	2391	2312	2392	2313	2393
	Accuracy	±0.2%    *±0.1% ( 10 ~ 30℃ )		±0.2%    *±0.1% ( 10 ~ 30℃ )		—	
	Size & Weight	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g

2	Model	MASTER-2α	MASTER-2Pα	MASTER-2T	MASTER-2PT	MASTER-2M	MASTER-2PM
28 ~ 62% (0.2%)	Cat.No.	2321	2941	2322	2942	2323	2943
Accuracy	±0.2%	*±0.1% ( 10 ~ 40℃ )	±0.2%	*±0.1% ( 10 ~ 40℃ )	—	—	—
Size & Weight	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/105g

3	Model	MASTER-3α	MASTER-3Pα	MASTER-3T	MASTER-3PT	MASTER-3M	MASTER-3PM
58 ~ 90% (0.2%)	Cat.No.	2331	2951	2332	2952	2333	2953
Accuracy	±0.2%	*±0.1% ( 10 ~ 40℃ )	±0.2%	*±0.1% ( 10 ~ 40℃ )	—	—	—
Size & Weight	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/90g

4	Model	MASTER-4α	MASTER-4Pα	MASTER-4T	MASTER-4PT	MASTER-4M	MASTER-4PM
45 ~ 82% (0.2%)	Cat.No.	2341	2961	2342	2962	2343	2963
Accuracy	±0.2%	*±0.1% ( 10 ~ 40℃ )	±0.2%	*±0.1% ( 10 ~ 40℃ )	—	—	—
Size & Weight	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/90g

10	Model	MASTER-10α	MASTER-10Pα	MASTER-10T	MASTER-10PT	MASTER-10M	MASTER-10PM
0 ~ 10% (0.1%)	Cat.No.	2371	2981	2372	2982	2373	2983
Accuracy	±0.2%	*±0.1% ( 10 ~ 30℃ )	±0.2%	*±0.1% ( 10 ~ 30℃ )	—	—	—
Size & Weight	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/155g	3.2×3.4×20.3cm/105g	3.2×3.4×20.3cm/105g

20	Model	MASTER-20α	MASTER-20Pα	MASTER-20T	MASTER-20PT	MASTER-20M	MASTER-20PM
0 ~ 20% (0.1%)	Cat.No.	2381	2991	2382	2992	2383	2993
Accuracy	±0.2%	*±0.1% ( 10 ~ 30℃ )	±0.2%	*±0.1% ( 10 ~ 30℃ )	—	—	—
Size & Weight	3.2×3.4×20.7cm/165g	3.2×3.4×20.7cm/110g	3.2×3.4×20.7cm/165g	3.2×3.4×20.7cm/110g	3.2×3.4×20.7cm/165g	3.2×3.4×20.7cm/110g	3.2×3.4×20.7cm/110g

53	Model	MASTER-53α	MASTER-53Pα	MASTER-53T	MASTER-53PT	MASTER-53M	MASTER-53PM
0 ~ 53% (0.5%)	Cat.No.	2351	2971	2352	2972	2353	2973
Accuracy	±0.5%	*±0.25% ( 10 ~ 30℃ )	±0.5%	*±0.25% ( 10 ~ 30℃ )	—	—	—
Size & Weight	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/130g	3.2×3.4×16.8cm/90g	3.2×3.4×16.8cm/90g

### Heat resistant

Series	H			
Material	Metal			
Model	MASTER-50H	MASTER-80H	MASTER-93H	MASTER-100H
Cat.No.	2354	2364	2374	2384
Range	Brix 0.0 ~ 50.0%	Brix 30.0 ~ 80.0%	Brix 45.0 ~ 93.0%	Brix 60.0 ~ 100.0%
Minimum	0.5%			
Accuracy	±0.5% *±0.25%			
Size & Weight	3.2×3.4× 16.8cm/130g			

### Special Scale

Sample	Coolant	Battery Coolant	Battery Coolant	Refractive index
Series	M	M	M	M
Material	Plastic	Plastic	Plastic	Metal
Model	MASTER-BR	MASTER-BC	MASTER-BCF	MASTER-RI
Cat.No.	2930	2931	2932	2612
Scale	① propylene glycol ② ethylene glycol	① ethylene glycol/freezing temp ② propylene glycol/freezing temp ③ battery fluid d20/20	① ethylene glycol/freezing temp ② propylene glycol/freezing temp ③ battery fluid d20/20	Refractive index
Range	① 0 to - 50℃ ② 0 to 70% 0 to - 50℃	① 0 to - 50℃ ② 0 to 70% 0 to - 50℃ ③ 1.150 to 1.300	① 32 to - 60°F ② 32 to - 50°F ③ 1.150 to 1.300	1.435 to 1.520
Minimum Scale	5% 5℃	① 5℃ ② 5℃ ③ 0.01	① 10°F ② 10°F ③ 0.01	0.001
Size & Weight		3.3×3.3×16.8cm, 90g		3.3×3.3×16.8cm, 120g

Sample	Seawater	Seawater	Salinity	Salinity	Salinity (Wide range)	Salinity (Wide range)
Series	α	M	α	M	α	M
Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Model	MASTER-S/MIIα	MASTER-S/MII M	MASTER-S10α	MASTER-S10 M	MASTER-S28α	MASTER-S28 M
Cat.No.	2491	2493	2471	2473	2481	2483
Scale	① Salinity ② Specificgravity		Sodium chloride		Sodium chloride	
Range	① 1‰ ② 0.001		0.0 to 10.0g/100g		0.0 to 28.0g/100g	
Minimum Scale	① 0 to 100‰ ② 1.000 to 1.070		0.1 g/100g		0.2 g/100g	
Measurement Accuracy	① ±2% *±1% ② ±0.001 *±0.0005 ( 10 to 30℃ )	—	±0.2g/100g *±0.1g/100g ( 10 to 30℃ )		±0.2g/100g *±0.1g/100g ( 10 to 30℃ )	
International Protection Class	IP65	—	IP65		IP65	
Size & Weight	3.3×3.3×20.4cm, 100g		3.3×3.3×20.4cm, 100g		3.3×3.3×20.4cm, 100g	

IP65 = dust-tight and protected against water jets (except eye piece)  
\*Repeatability