# Want Bluetooth<sup>®</sup> on the PAL that you buy?

Che

## Digital Hand-Held "Pocket" Refractometer PAL Special Scales

	Cat.No.	Model	Scale
	Food, Co	onfectionery, l	Food Ingredients
	4422	PAL-22S	Honey moisture
	4508	PAL-Pâtissier	Brix / Baume (Dual scale)
	3807	PAL-MILK	NEW Non-Fat Milk Solids
	4427	PAL-27S	Soymilk
	4443	PAL-43S	Bittern (Magnesium chloride)
	4496	PAL-96S	Chinese noodle soup / Baume of
			Kansui (Dual scale)
	4498	PAL-98S	Condiment
	4439	PAL-39S	Hydrogen peroxide
	4429	PAL-29S	Citric acid
	4430	PAL-30S	Acetic acid
	4432	PAL-32S	Phosphoric acid
	4440	PAL-40S	Sodium hydroxide
	4464	PAL-64S	Sodium bicarbonate
	4465	PAL-65S	Sodium tartrate
	4470	PAL-70S	Potassium phosphate
	4523	PAL-COFFEE	
	4532	PAL-COFFEE	TDS
		(TDS)	
	4533		Brix / TDS (Dual scale)
		(BX/TDS)	
	4535	PAL-Tea	Теа
	Fruit and	d Vegetable G	rowers
	3847	PAL-ORANGE	Brix
	3848	PAL-TOMATO	Brix
	3849	PAL-MAPLE	Brix
	Sugar		
	4412	PAL-12S	Dextran
	4414	PAL-14S	Fructose
	4415	PAL-15S	Glucose
	4416	PAL-16S	High Fructose Corn syrup (HFCS-42)
	4417	PAL-17S	High Fructose Corn syrup (HFCS-55)
	4418	PAL-185	Inverted suger
	4419	PAL-19S	Lactose
	4420	PAL-20S	Maltose
	Wine, Br		
	4479	PAL-79S	T.A. 1990
	4480	PAL-80S	T.A. 1971
	4483	PAL-83S	KMW (or Babo)
	4484	PAL-84S	Baume
	4486	PAL-86S	Oe (Ger) / Brix (Dual scale)
	4487	PAL-803	Oe (Oechsle) / Brix (Dual scale)
	4407	PAL-075 PAL-Whiskey	Ethyl alcohol
	4540	PAL-Whiskey PAL-Vodka	Ethyl alcohol
	4542	PAL-Tequila	Ethyl alcohol
	4543	PAL-Shochu	Ethyl alcohol
	4544	PAL-Gin	Ethyl alcohol
	4545	PAL-Rum	Ethyl alcohol
	4546	PAL-Brandy	Ethyl alcohol
	4590	PAL-Plato	Plato (Sweet wort)
	Salinity,	Seawater	
	4403	PAL-03S	Sodium chloride (g/100g)
	4393	PAL-03CS	Sodium chloride (g/100g) / Freezing
			point of Sodium chloride (°C) (Dual scale)

Cat.No.	Model	Scale				
4506	PAL-106S	Sodium chloride (g/100mL)				
4404	PAL-04S	Sodium chloride (S.G.)				
4405	PAL-05S	Sodium chloride (Baume)				
4406	PAL-06S	Seawater (Concentration)				
4407	PAL-07S	Seawater (S.G.)				
4408	PAL-08S	Seawater (Baume)				
Moisture		Scawater (Baame)				
4573	PAL-Moisture	Moisture				
4574	PAL-MOISture PAL-Dried	Moisture				
4374	Fruit Moisture	Moisture				
4575	PAL-Dates	Moisture				
-	Moisture					
Clinical,						
4442	PAL-42S	Cesium chloride				
4453	PAL-53S	Copper sulfate (Concentration)				
4454	PAL-54S	Copper sulfate (S.G.)				
4410	PAL-10S	Urine (S.G.)				
4585	PAL-mOsm.	Urine Osmolality				
4401	PAL-11S	Serum protein				
4510	PAL-USG (DOG)	Dog Urine (S.G.)				
4511	PAL-USG (CAT)	Cat Urine (S.G.)				
4512	PAL-RABBIT	Rabbit Urine (S.G.)				
Colostru	Im					
3805	PAL-Colostrum	Colostrum				
Alcohol		colosidam				
4433	PAL-33S	Ethyl alcohol (mL/100mL)				
4434	PAL-34S	Ethyl alcohol (g/100g)				
4436	PAL-36S	Methyl alcohol				
4437	PAL-37S	Isopropyl alcohol (g/100g)				
4530	PAL-131S	Isopropyl alcohol (mL/100mL)				
4485	PAL-85S	Polyvinyl alcohol				
	ceutical reage					
4412	PAL-12S	Dextran				
4413	PAL-13S	Creatine				
4423	PAL-23S	Glycerin (Low concentration)				
4424	PAL-24S	Glycerin (High concentration)				
4425	PAL-25S	Inulin				
4426	PAL-26S	Mannitol				
4431	PAL-31S	Formic acid				
4432	PAL-32S	Phosphoric acid				
4451	PAL-51S	Sodium bromide				
4455	PAL-55S	Magnesium sulfate				
4464	PAL-64S	Sodium bicarbonate				
4465	PAL-65S	Sodium tartrate				
4466	PAL-66S	Potassium oxalate				
4468		Potassium dichromate				
	PAL-68S					
4470	PAL-70S	Potassium phosphate				
4472	PAL-72S	Sodium tungstate				
		Heat Transfer, Industrial				
4518	PAL-Urea	Urea				
4403	PAL-03S	Snow-melting agent (Sodium chloride)				
4441	PAL-41S	Snow-melting agent (Calcium chloride)				
4443	PAL-43S	Snow-melting agent (Magnesium chloride)				
4488	PAL-88S	Propylene glycol Freezing point of				
		Propylene glycol (°C)				

•	lai JC	ales
	C	
	Model	Scale
•	PAL-89S	Propylene glycol Freezing point of
	FAL-095	Propylene glycol (°F)
	PAL-91S	Ethylene glycol Freezing point of
		Ethylene glycol (°C)
	PAL-92S	Ethylene glycol Freezing point of
		Ethylene glycol (°F)
ti	ve Index • Brix	
	PAL-BX/RI	Brix / Refractive Index
	PAL-RI	Refractive Index
	PAL-a	Brix
	PAL-LOOP	Brix
C	al products	
	PAL-21S	Dextrin
	PAL-38S	Dimethylformamide
	PAL-40S	Sodium hydroxide
	PAL-23S	Glycerin (Low concentration)
	PAL-24S	Glycerin (High concentration)
	PAL-30S	Acetic acid
	PAL-31S	Formic acid
	PAL-32S	Phosphoric acid
	PAL-44S	Lithium chloride
	PAL-45S	Barium chloride
	PAL-46S	Cobalt chloride
	PAL-47S	Ferric chloride
	PAL-48S	Strontium chloride
	PAL-49S	Potassium chloride
	PAL-50S	Potassium bromide
	PAL-51S	Sodium bromide
	PAL-52S	Potassium iodide
	PAL-53S	Copper sulfate (Concentration)
	PAL-54S	Copper sulfate (S.G.)
	PAL-55S	Magnesium sulfate
	PAL-56S	Potassium sulfate
	PAL-57S	Nickel sulfate
	PAL-58S	Sodium sulfate
	PAL-59S	Zinc sulfate
	PAL-60S	Silver nitrate
	PAL-61S	Sodium nitrate
	PAL-62S	Potassium carbonate
	PAL-63S	Sodium carbonate
	PAL-64S	Sodium bicarbonate
	PAL-67S	Potassium chromate
	PAL-68S	Potassium dichromate
	PAL-69S	Sodium thiosulfate
	PAL-70S	Potassium phosphate
	PAL-71S	Sodium molybdate
	PAL-72S	Sodium tungstate
W	orking	
	PAL-102S	Cutting oil
	PAL-AntiRust	
	PAL-Cleaner	
v	il engineering	

act Atago for more information

4571 PAL-Soil Gravimetric / Volumetric Soil moisture (Dual scale)

All ATAGO products are designed and manufactured in Japan.





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"Pocket"	Digital Hand-Held Refractometers
Pocket PA	
PAL-1 Cat.No.3810 Brix 0.0 to 53.0%	PAL-S Cat.No.3860 Mode S <sup>TM</sup> Brix 0.0 to 93.0% Technology Mode
PAL-2 Cat.No.3820 Brix 45.0 to 93.0%	PAL-22S Cat.No.4422 Honey moisture 12.0 to 30.0%
PAL-3 Cat.No.3830 Brix 0.0 to 93.0%	PAL-39S Cat. No.4439 Hydrogen peroxide 0.0 to 50.0%
	Pocket-Pa
	r ochet-ra

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\* Specifications and appearance are subject to change without notice

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**O**ATAGO<sup>®</sup>

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available



## **The Next Generation of Digital Refractometers**



## PAL commitment

#### A new ergonomic design for comfort and ease of use!

In pursuit of an "easy to use", "easy to operate" and ergonomic architecture of new instruments, ATAGO has achieved a "palmfitting" masterpiece as well as unit that is high in hygienic properties. By reducing the number of unnecessary assembly parts, we have reduced the risks of a germ reproductive environment. Through our efforts to produce a hygienic instrument to be used in any industry, these units are designed to be completely washable. The new PAL series has been approved by the HACCP, and are equipped with the new ELI feature, which ensures accurate measurements - even outdoors Requests from our customers worldwide are reflected in the development of the new PAL units.

## Sample Stage

The SUS sample stage allows for the sample temperature to conform quickly and evenly to the prism temperature for accurate

measurements

## START Key

Conveniently located for single hand operation.



#### **Measurement Method**

surface.

**Application examples** 





## Press the START key.

## **Specifications**

Measureme range Measuremer Accuracy Resolution

Measureme temperatu Ambient temperatu Power suppl

Internationa protection class Dimensior

APAL-CASE

APAL Silicone Cover

"Pocket" Refractometers PA Series



#### Prism

Made of highly durable optical glass to prevent scratching.

#### **Liquid Crystal Display** (LCD)

Digital measurement values are large and easy to read. Displays battery indicator and temperature.

#### **ZERO Key**

For Zero Setting, place water on the prism and press.

#### **Strap Holder**

Suitable for wrist straps or lanyards.



ATAGO

START

ckos

EFRACTOMETER PAL-

20.3

(ZERO)



Measurement value and prism 3 Measurement value and prism temperature are displayed in 3 seconds!

PAL-1	PAL-2	PAL-3	PAL-S	PAL-22S	PAL-39S		
Cat.No.3810	Cat.No.3820	Cat.No.3830	Cat.No.3860	Cat.No.4422	Cat.No.4439		
Brix	Brix	Brix	Brix	Honey moisture	Hydrogen peroxide		
0.0 to 53.0%	45.0 to 93.0%	0.0 to 93.0%	0.0 to 93.0%	12.0 to 30.0 %	0.0 to 50.0%		
	rix	Brix	Brix	Honey moisture	Hydrogen peroxide		
	1.2%	±0.1%	±0.2%	±0.2 %	±0.6%		
	Bi	Honey moisture	Hydrogen peroxide				
	0.1	0.1 %	0.2%				
10 to 100°C (ATC) (Hot samples over 100°C can be measured under specified conditions. Please contact ATAGO for further details.)							

10 to 40°C

2×AAA Batteries

IP65 Water resistant

5.5×3.1×10.9cm, 100a





The Digital Hand-Held "Pocket" Refractometer PAL-RI, can easily measure samples and display readings digitally. And temperature of the measurement will be displayed continuously.

Digital Hand-held "Pocket" Refractometer Cat.No.3850

## Example of display

i.e.) display of the measurement values "1.3425" and "20.0°C".



The numeric characters will stream from right to left on the display in intervals of 0.8 seconds.

Quick & East clean



## Features

- Requires only a few drops of sample
- Measurement in 3 seconds
- Ergonomically designed for easy. one-handed operation
- Light & Compact, 100g
- Designed with a strap holder option
- Highly water resistant (IP65)
- Convenient storage case
- Battery power indicator

: Refractive index 1.3306 to 1.5284 Measurement range Temperature Resolution

**Specifications** 

Refractive index 0.0001, Temperature 0.1°C Refractive index ±0.0003 (water at 20°C) Measurement accuracy Temperature ±1°C Measurement temperature: 5 to 45°C : 10 to 40°C Ambient temperature : AAA alkaline battery × 2 Power supply : Approx. 11,000 measurements Battery life International Protection Class: IP65 Water resistant : 55(W) × 31(D) × 109(H)mm, 100g (Main Unit only) Dimensions and weight

HACCPIGMPIGLP

REFRACTIVE INDEX

START

REFRACTOMETER

ZERO

PAL-RI

5.0 to 45.0°C

Actual

size

\*The displayed refractive index is not the temperature compensated value. It is the refractive index for the displayed measurement temperature.

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

# DIGITAL HAND-HELD "POCKET" REFRACTOMETER



## Measurement Method



Apply 2-3 drops onto the prism surface.



Press the START key.

The measurement value will be displayed in 3 seconds.



## Special Anniversary model with a wide Brix range 0 to 85%!!

## Application

- \* Outdoors in the vegetable fields and fruit orchards
- \* Indoors for beverages (fruits juice, coffee, soft drink, etc) and foods (soy sauce,
- sauce, seasoning, soup, jam, marmalade, maple syrup, etc.) \* At fruit and vegitable packing facilities and in the supermarket
- \* At restaurants or shops
- \* At junior high schools, high schools, or universities as course material

## Features

Actual

Size

- \* Calibration with water only
- \* Measurement in 3 seconds
- \* Extremely water resistant (IP65)
- \* Light & Compact, 100g
- Ergonomically designed for easy, one-handed operation
- \* Convenient storage case
- \* Automatic Temperature Compensation (ATC)
- \* Designed with a strap holder option

## **Specifications**

Measurement range Resolution Measurement accuracy Repeatability Ambient Temperature Measurement Temperature Sample volume Measurement time Power supply Battery life

International Protection Class Dimensions and weight Brix 0.0 to 85.0%
Brix 0.1%
Brix ±0.2%
Brix ±0.1%
10 to 40°C
10 to 75°C (Automatic Temperature Compensation)
0.3ml or more
3 seconds
AAA alkaline battery × 2
Approx. 11,000 measurements (Using new alkaline batteries)

vashed under runt

IP65 Water resistant
 55(W)×31(D)×109(H)mm, 100g

HACCPIGMPIGLP

All ATAGO refractometers are designed and manufactured in Japan.

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