

PAL Series

The **Original** Pocket Refractometer.

- NEW** Measurement temperature up to 100°C
- NEW** Temperature display

- Extremely water resistant (IP65)
- Revolutionary new ELI feature
- Calibration with water only
- Light & compact, 100g
- Automatic Temperature Compensation (ATC)
- Ergonomically designed for one-handed operation
- 2 carrying options: strap and case
- Hard plastic storage case
- Will float if accidentally dropped in water
- Can be washed under running water

ELI External Light interference (ELI) Patented

When intense light penetrates the prism of a digital refractometer, the light waves interfere with the sensor, which may lead to inaccurate measurements. To ensure accurate measurement results, the PAL is programmed with the ELI function which displays the [nnn] warning message when intense direct light is detected. Forming a habit of shading the sample stage with your hand and re-pressing the START key (when the warning message from the ELI function is displayed) will ensure accurate measurement results each time.

Measurement Method



Apply 2-3 drops on the Prism surface.



Press the START key.



Measurement value and prism temperature are displayed in 3 seconds!



Optional Accessories



● PAL-case
Part No.RE-39409



● Strap
Part No.RE-39410



Full Range & High Accuracy

PAL-3

Cat.No.3830



The PAL-3 has been modified to have a high measurement accuracy at $\pm 0.1\%$ Brix.

RNG : Brix 0.0 to 93.0%
ACC : Brix $\pm 0.1\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



0.0 to 53.0 Brix

PAL-1

Cat.No.3810



The PAL-1 works perfectly in measuring almost any fruit juice, food, or drink, such as soup, sauce, ketchup, tomato sauce, and low-sugar jam.

RNG : Brix 0.0 to 53.0%
ACC : Brix $\pm 0.2\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



Improved Repeatability

PAL-S

Cat.No.3860



The PAL-S improves repeatability of samples that cause inconsistent readings. Ideal for fatty, dark, and/or emulsion samples, such as dairy products.

RNG : Brix 0.0 to 93.0%
ACC : Brix $\pm 0.2\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



Standard accessory : MAGIC™

Reference

RNG	Measurement range
ACC	Measurement accuracy
TMP	Measurement temperature
RES	Resolution

※ 10 to 100°C (Automatic Temperature Compensation) (Hot samples over 100°C can be measured under specified conditions. Please contact ATAGO for further details.) ※ Temperature display range is 9.0 to 99.9°C.

Wide Brix Range

PAL-α

Cat.No.3840



The PAL-α is a special model with a wide Brix range (0-85%) offered at a very reasonable price.

RNG : Brix 0.0 to 85.0%
ACC : Brix $\pm 0.2\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



High Brix

PAL-2

Cat.No.3820



The PAL-2 can measure various high concentration samples, such as jam, marmalade, jelly, honey, and concentrated juice.

RNG : Brix 45.0 to 93.0%
ACC : Brix $\pm 0.2\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



Continuous Measurement

PAL-LOOP

Cat.No.3842



The PAL-LOOP is a special model with new Continuous Measurement feature, which expands on traditional measuring method.

RNG : Brix 0.0 to 85.0%
ACC : Brix $\pm 0.2\%$, $\pm 1^\circ\text{C}$
TMP : 10 to 100°C (ATC)
RES : Brix 0.1%, 0.1°C



Common Specifications

Ambient temperature	10 to 40°C
Power supply	2×AAA Batteries
International protection class	IP65 Water resistant
Dimensions and weight	5.5×3.1×10.9cm, 100g

ATAGO® POCKET REFRACTOMETER

Brix & Refractive Index

PAL-BX/RI

Cat.No.3852

Dual Scale

Dual scales of Brix (0.0-93.0% full range, $\pm 0.1\%$ accuracy) and Refractive Index (0.0001 nD resolution).

RNG: Brix (Bx) 0.0 to 93.0%

Refractive Index (RI) 1.3306 to 1.5284

ACC: Bx $\pm 0.1\%$, $\pm 1^\circ\text{C}$ RI ± 0.0003 , $\pm 1^\circ\text{C}$

TMP: Bx 10 to 100°C (ATC) RI 5 to 45°C

RES: Bx 0.1%, 0.1°C RI 0.0001, 0.1°C



Refractive Index

PAL-RI

Cat.No.3850

nD Scale

Suitable for Refractive Index (0.0001 nD resolution) measurement. The Refractive Index and temperature of the sample will continuously scroll across the display.

RNG: 1.3306 to 1.5284

ACC: ± 0.0003 , $\pm 1^\circ\text{C}$

TMP: 5 to 45°C

RES: 0.0001, 0.1°C



Honey Moisture

PAL-22S

Cat.No.4422

Honey

For measuring the % water content of honey easily and displays readings digitally. Comfortable, easy to use, light & compact.

RNG: 12.0 to 30.0%

ACC: $\pm 0.2\%$, $\pm 1^\circ\text{C}$

TMP: 10 to 40°C (ATC)

RES: 0.1%, 0.1°C



Sodium Chloride (w/w)

PAL-03S

Cat.No.4403

NaCl

For measuring the concentration of sodium chloride in water. Ideal for measuring de-icing fluids, brines, and other salt water.

RNG: 0.0 to 28.0%

ACC: $\pm 0.2\%$, $\pm 1^\circ\text{C}$

TMP: 10 to 40°C (ATC)

RES: 0.1%, 0.1°C



Propylene Glycol (v/v)

PAL-88S/89S

Cat.No.4488,4489

P.G.

For measuring the concentration of propylene glycol concentration and freezing point in °C (88S) or °F (89S).

PAL-88S

RNG: Co 0.0 to 90.0% Fr 0 to -50°C

ACC: Co $\pm 0.4\%$, $\pm 1^\circ\text{C}$ Fr $\pm 1^\circ\text{C}$

TMP: 10 to 40°C (ATC)

RES: Co 0.2%, 0.1°C Fr 1°C

PAL-89S

RNG: Co 0.0 to 90.0% Fr 32 to -60°F

ACC: Co $\pm 0.4\%$ Fr $\pm 1^\circ\text{F}$

TMP: 50 to 104°F (ATC)

RES: Co 0.2% Fr 1°F

Co = Concentration of Propylene glycol
Fr = Freezing point of Propylene glycol



PAL-88S

Ethylene Glycol (v/v)

PAL-91S/92S

Cat.No.4491,4492

E.G.

For measuring the concentration of ethylene glycol concentration and freezing point in °C (91S) or °F (92S).

PAL-91S

RNG: Co 0.0 to 90.0% Fr 0 to -50°C

ACC: Co $\pm 0.4\%$, $\pm 1^\circ\text{C}$ Fr $\pm 1^\circ\text{C}$

TMP: 10 to 40°C (ATC)

RES: Co 0.2%, 0.1°C Fr 1°C

PAL-92S

RNG: Co 0.0 to 90.0% Fr 32 to -60°F

ACC: Co $\pm 0.4\%$ Fr $\pm 1^\circ\text{F}$

TMP: 50 to 104°F (ATC)

RES: Co 0.2% Fr 1°F

Co = Concentration of Ethylene glycol
Fr = Freezing point of Ethylene glycol



PAL-91S

Hydrogen Peroxide (w/w)

PAL-39S

Cat.No.4439

H2O2

For measuring the concentration of hydrogen peroxide (H2O2) commonly used as a disinfectant.

RNG: 0.0 to 50.0%

ACC: $\pm 0.6\%$, $\pm 1^\circ\text{C}$

TMP: 10 to 35°C (ATC)

RES: 0.2%, 0.1°C



Cutting Oil

PAL-102S

Cat.No.4502

Cutting Oil

For measuring the concentration of cutting oils. Suitable for measuring the percent dilution of hydraulic oil and cleaning liquids.

RNG: 0.0 to 70.0

ACC: ± 0.2 , $\pm 1^\circ\text{C}$

TMP: 10 to 75°C (ATC)

RES: 0.1, 0.1°C



Seawater

PAL-06S

Cat.No.4406

Sea Water

For measuring the salinity of seawater. The salinity is displayed in parts per mille(‰). Essential for aquaculture.

RNG: 0 to 100‰

ACC: $\pm 2\%$, $\pm 1^\circ\text{C}$

TMP: 10 to 40°C (ATC)

RES: 1‰, 0.1°C



Brix & Baume

PAL-Pâtissier

Cat.No.4508

Baume

Dual scale of Brix and Baume. Ideal refractometer for pastry chefs. Wide range of 0.0-85.0% Brix.

RNG: Brix(Bx) 0.0 to 85.0%

ACC: Bx $\pm 0.2\%$, $\pm 1^\circ\text{C}$ Ba $\pm 1^\circ$, $\pm 1^\circ\text{C}$

TMP: Bx 10 to 100°C (ATC) Ba 10 to 100°C (ATC)

RES: Bx 0.1%, 0.1°C Ba 1°, 0.1°C



Plato

PAL-Plato

Cat.No.4590

Plato

Designed for breweries to measure the wort's percent extract by weight in degrees Plato. Only a small amount of sample required for temperature-compensated readings. Digital display - no more guessing where the line is.

RNG: 0.0 to 30.0°P

ACC: $\pm 0.2^\circ\text{P}$, $\pm 1^\circ\text{C}$

TMP: 10 to 75°C (ATC)

RES: 0.1°P, 0.1°C



Reference

RNG	Measurement range
ACC	Measurement accuracy
TMP	Measurement temperature
RES	Resolution

Common Specifications

Ambient temperature	10 to 40°C	(PAL-39S 10 to 35°C)
Power supply	2×AAA Batteries	
International protection class	IP65 Water resistant	
Dimensions and weight	5.5×3.1×10.9cm, 100g	