Future planning

Optional Accessories

Part No.	Part Name
RE-39003	Spare cushion R (3 sets)
RE-39007	Spare cushion S (2 pieces)
RE-39415	PAL-HIKARi Silicone Cover

All ATAGO products are designed and manufactured in Japan.

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HACCP GMP GLP

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

* Specifications and appearance are subject to change without notice.

ENV.04 1901500PP Printed in Japan

HIKARI

Digital Hand-held “Pocket” IR Brix Meter

Technology Category Encouragement Award Winner
The 7th Shibusawa Eiichi Business Grand Prize

Award for Excellence Winner
The 30th Small and Medium Enterprise Excellent New Technology・New Product

Small and Medium Enterprise Agency's Director Award Winner
2018 Kanto Plain 'Hatsumei' (Invention) Commondation

The Tokyo Venture Technology Awards Honorable Mention

2 ways to measure

Just touch the fruit and press the side button

Place a fruit, then just press the START button

Touch the surface of fruit

The Brix (sugar level) can be measured by placing the fruit on the sample stage with no need of cutting or squeezing. It requires no more cumbersome wiping and cleansing after each measurement.

Total inspection is possible.

All it takes is to put it against a fruit so each individual fruits' Brix (sugar level) can be inspected. The measured fruits are intact and can then be shipped and sold after measurement.

Super lightweight that fits in your pocket

PAL-HIKARi is the world most compact nondestructive Brix meter. The button located on the lateral side of the unit makes it possible to take measurements with one hand while the fruits that are on the tree. The unit is battery powered which makes it possible to take measurements anywhere.

Fits well on the surface of a fruit

The cushion on PAL-HIKARi allows for a secure surface contact with fruits. Regardless of the fruit shape, PAL-HIKARi's fits snug which eliminates measurement discrepancies caused by external light interference or placement of the fruits.

Series total 360,000 unit

*PAL series

ATAGO is an established manufacture of Brix meters since 1940. For Brix (sugar level), with ATAGO's proven track of history in technology, PAL-HIKARi is developed on basis of this accomplished technology.
ATAGO products are used in 154 countries worldwide.

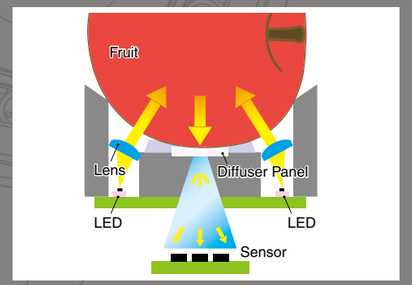
HIKARi

New

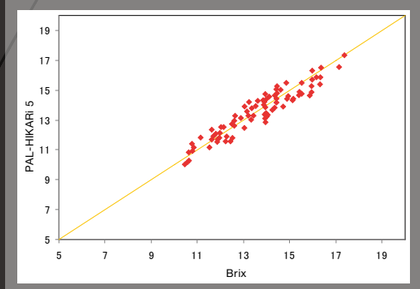
ELI (External Light Interference)Function

PAL-HIKARi is equipped with ELI (External Light Interference) function that will detect when external light enters the instrument making measurement taking possible outdoors, while the fruits are growing on the tree. When the light is detected, the instrument will display 'nnn'.

PAL-HIKARi's principal measurement method



Correlation between PAL-HIKARi and Brix (sugar level)



*The graph is based on the apple scale

Offset feature

This function allows to adjust fixed numeric value to the measurement value. Please use the offset feature to match the measurement value with already owned Brix meter.

PAL-HIKARi is patent pending.

User Testimonials

Even grapes still on the vine are easy to measure

An acquaintance told me about PAL-HIKARi. We are using it to check whether the grapes are ready to ship and the quality when we try growing new varieties. I like how small and lightweight the PAL-HIKARi is, which makes it easy to measure grapes that are still on the vine. I'm also pleased with how reasonably priced the PAL-HIKARi is compared to devices made by other manufacturers.

Mochizuki Fruits Farm

PAL-HIKARi 2 Cat.No.5452

Measurement fruit	Grapes (Recommended sample size is 15 mm or greater in diameter)	Automatic Temperature Control Range	15.0 to 30.0°C *acclimate grape to ambient temperature
Measurement Range	Brix 10.0 to 25.0%	Ambient Temperature	15 to 35°C
Resolution	Brix 0.1%	International Protection Class	IP64
Measurement Accuracy	Brix ±1.5% *Guaranteed accuracy range:15.0 to 30.0°C *Grape varieties and measurement environment may affect accuracy.	Battery Life	Approx. 4,000 measurements (when alkaline batteries are used)
		Power Supply	2 x AAA alkaline batteries
Repeatability	Brix ±1%	Dimensions and Weight	6.1(W) × 6.4(D) × 11.5(H)cm, 153g (main unit and small sample stage S only)

Cat.No.5552
IR Brix Meter × Brix Meter (Grapes)
·PAL-HIKARi 2
·PAL-0

Cat.No.5652
IR Brix Meter × Brix Acidity Meter (Grapes)
·PAL-HIKARi 2
·PAL-BX|ACID2

Leading Varieties in Japan

Black Beat
Aug.

Gigantic Peak (Kyoho)
Aug.– Sept.

Pione
Aug.– Sept.

Fujiminori
Aug.– Sept.

Queen Nina
Aug.– Sept.

Shine Muscat
Aug.– Sept.

Gorby
Aug.– Sept.

Nagano Purple
Sept.– Oct.

Suiho
Sept.– Oct.

PAL-HIKARi 5 Cat.No.5455

Measurement fruit	Apple	Ambient Temperature	5 to 35°C
Measurement Range	Brix 10.0 to 18.0%	International Protection Class	IP64
Resolution	Brix 0.1%	Battery Life	Approx. 4,000 measurements (when alkaline batteries are used)
Measurement Accuracy	Brix ±1% *Apple varieties and measurement environment may affect accuracy.	Power Supply	2 x AAA alkaline batteries
Repeatability	Brix ±1%	Dimensions and Weight	6.1(W) × 4.4(D) × 11.5(H)cm, 120g (Main Unit only)
Automatic Temperature Control Range	5.0 to 35.0°C *Acclimate apple to ambient temperature		

Cat.No.5555
IR Brix Meter × Brix Meter (Apple)
·PAL-HIKARi 5
·PAL-0

Cat.No.5655
IR Brix Meter × Brix Acidity Meter (Apple)
·PAL-HIKARi 5
·PAL-BX|ACID5

Story

1,200,000 yen apple ?!

The focus of attention, “Esashi Apple” is the top brand selected by JA (Japan Agricultural Co-operatives) Esashi from among apples grown in unique environment of Esashi region of Okushu city in Iwate prefecture in characteristic regional soil, climate, dwarfing technique, and keeping them unbagged.

After selective selection process, only those with the right color, size, shape and sugar level are allowed to be called “Esashi Apple”. From the entire harvest, only 1% is selected as the special of the top grade.

In recent years, the auctioned price of the special selection grade is the fall’s biggest news. A box of 10kg special selection grade was sold during auctioned for 1,200,000 yen. The cost of an apple was 43,000 yen.

Esashi apple is proudly locally made over 40 years. Following the example of Esashi apple, many unique savory brands are beginning to appear Japan.

The most expensive variety apple brand was “Sun Fuji.”

Story

“Fuji” and “Sun Fuji” ?

Originating in Fujisaki machi, a town located in Aomori prefecture, “Fuji apple” is grown worldwide with highest global production in the world. “Sun Fuji” and “Fuji” are thought as a different variety from each other but is both “Fuji apple.”

Matured “Fuji” is enclosed in brown paper bags to keep insect pests from getting to them before harvesting. Its distinctive characteristics are thin skin and vibrant color.

On the other hand, “Sun Fuji” is not bagged and is exposed to sunlight for a long duration of time. The color may not be quite as good but its sugar level is very high.

“Sun Fuji” branching from “Fuji” was branded to have sweet flavor while “Fuji” was branded for its pretty reddish color. From this branding, one variety of apple made it possible to satisfy different market needs such as “good color and storability” and “naturally distinct sweetness.”

Leading Varieties in Japan

Natsu Midori
Jul.– Aug.

Sansa
Aug.– Sept.

Tsugaru
Aug.– Sept.

Akibae
Sept.– Oct.

Jonathan
Oct.

Shinano Gold
Oct.– Nov.

Sun Mutsu
Oct.– Jan.

Sun Fuji and Fuji
Oct.– Jan.

Mutsu
Nov.– Jan.

PAL-HIKARi 10 Cat.No.5460

Measurement fruit	Peach	Ambient Temperature	5 to 35°C
Measurement Range	Brix 8.0 to 20.0%	International Protection Class	IP64
Resolution	Brix 0.1%	Battery Life	Approx. 4,000 measurements (when alkaline batteries are used)
Measurement Accuracy	Brix ±1.5% *Peach varieties and measurement environment may affect accuracy.	Power Supply	2 x AAA alkaline batteries
Repeatability	Brix ±1%	Dimensions and Weight	6.1(W) × 4.4(D) × 11.5(H)cm, 120g (Main Unit only)
Automatic Temperature Control Range	5.0 to 35.0°C *Acclimate peach to ambient temperature		

Cat.No.5560

IR Brix Meter × Brix Meter (Peach)

·PAL-HIKARi 10
·PAL-0

Story

Guinness World Records World's Sweetest Peach

Well known producers of the peaches are located in Yamanashi, Fukushima, Nagano prefectures in Japan. "World's highest Brix peach" recorded in Guinness World Records can be found in Kishiwada city, Osaka prefecture. During the Guinness World Records challenge, the average peaches measured 22.2 Brix for "Masahime" produced by Maruya Farm in Kishiwadashi Kanechikachou.

General Brix level of peaches are about 10 to 12, so its surprising sweetness is nearly double the regular peaches. Kanechikachou has always been a famous place of peaches since ancient times but its nationwide awareness is low. It gained media publicity as a result of this Guinness World Records registration.
The challenge to Guinness World Records was a long hard work that lasted three years, but by the effort of President Takahiro Matsumoto of "Maruya Farm", "Kanechika's peach" was able to push its brand power.

Peach of "Maruya Farm" is also selling on the internet, but is a very popular item that "sold out" in 15 minutes from the start of reservation.

Leading Varieties in Japan

Ryumonwase
Jun.

Hikawahakuhou
Jun.– Jul.

Hakuhou
Jun.– Aug.

Shimozuhakutou
Jul.– Aug.

Natsukko
Aug.

Akatsuki
Aug.

Kawanakajimahakutou
Aug.– Sept.

Sachiakane
Aug.– Sept.

Yuzora
Sept.

PAL-HIKARi 12 Cat.No.5462

Measurement fruit	Asian Pear	Ambient Temperature	5 to 35°C
Measurement Range	Brix 10.0 to 16.0%	International Protection Class	IP64
Resolution	Brix 0.1%	Battery Life	Approx. 4,000 measurements (when alkaline batteries are used)
Measurement Accuracy	Brix ±1% *Asian Pear varieties and measurement environment may affect accuracy.	Power Supply	2 x AAA alkaline batteries
Repeatability	Brix ±1%	Dimensions and Weight	6.1(W) × 4.4(D) × 11.5(H)cm, 120g (Main Unit only)
Automatic Temperature Control Range	5.0 to 35.0°C *Acclimate asian pear to ambient temperature		

Cat.No.5562
IR Brix Meter × Brix Meter (Asian Pear)
·PAL-HIKARi 12
·PAL-0

Cat.No.5662
IR Brix Meter × Brix Acidity Meter (Asian Pear)
·PAL-HIKARi 12
·PAL-BX|ACID12

Story

Already available during Yayoi period

Amongst all the fruits grown in Japan, Asian pears have a long history with a recorded history of its consumption during the Yayoi period (300BC-300AD). Asian pears are one of the fruits popular in Japan since long ago, such poem in which "pears" have been included among the oldest existing collection of Japanese poetry,“Manyoushu." It features a distinctive texture, with sweetness and juiciness. There are many varieties and with more than 150 kinds of varieties the sweet variety are known as Shintakanashi. Its Brix measures about 12 but because it is not very tart, the sweetness tastes even stronger.

Shintakanashi is also called “Jumbo Nashi” (jumbo pear) each weighing 600g to 1kg. Larger ones can even weigh about 1.5kg. Compared to the other Asian pears, this is almost 2 to 3 times larger than the regular Asian pears. Its large size and appearance, it is a popular variety fro gifts. Popularity as a gift is not limited to Japan alone, there is a demand for gifts in Mid-Autumn Festival in Taiwan, and it is one of the brand pears exported overseas. The fact it is not as tart as other pears, and its good appearance wins popularity among other domestic pears.

Leading Varieties in Japan

Kousui
Jul.– Sept.

Nijusseiki
Aug.– Oct.

Housui
Sept.

Niitaka
Sept.

Nansui
Sept.– Nov.

Akizuki
Oct.– Nov.

Nikkori
Oct.– Nov.

Okusankichinashi
Oct.– Nov.

Shinkou
Oct.– Nov.

IR Brix Meter × Brix Meter

Light x Refraction
from outside, from inside, good flavor

A combo set that includes PAL-HIKARi, a non-destructive IR Brix Meter that can measure the sugar content just by being pressed against the fruit, and a Brix meter that can measure the sugar content of squeezed fruit juice is now available.
Special scales are available for each fruit. Choose the appropriate combo set.

Cat.No.	Part Name
5552	IR Brix Meter × Brix Meter (Grapes) PAL-HIKARi 2 + PAL-0
5555	IR Brix Meter × Brix Meter (Apple) PAL-HIKARi 5 + PAL-0
5560	IR Brix Meter × Brix Meter (Peach) PAL-HIKARi 10 + PAL-0
5562	IR Brix Meter × Brix Meter (Asian Pear) PAL-HIKARi 12 + PAL-0

PAL-0 Specifications

PAL-0 is not sold separately. PAL-0 is only available for IR Brix Meter x Brix Meter combo set.

Measurement Range	Brix Temperature	0.0 to 33.0% 10 to 100°C
Resolution	Brix Temperature	0.1% 0.1°C
Measurement Accuracy	Brix Temperature	±0.2% ±1°C
Automatic Temperature Control Range	10 to 100°C	

Ambient Temperature	10 to 40°C
International Protection Class	IP65
Power Supply	2 x AAA alkaline batteries
Dimensions and Weight	5.5(W) ×3.1(D) ×10.9(H)cm, 100g (Main Unit only)

IR Brix Meter × Brix-Acidity Meter

Acidity x Brix
good sourness, good sweetness, perfect flavor

A combo set that includes PAL-HIKARi, a non-destructive IR Brix Meter that can measure the sugar content just by being pressed against the fruit, and PAL-BX|ACID, a Brix-acidity meter that can measure the sugar content of squeezed fruit juice is now available.
Special scales are available for each fruit. Choose the appropriate combo set.

Cat.No.	Part Name
5652	IR Brix Meter × Brix Acidity Meter (Grapes) PAL-HIKARi 2 + PAL-BX|ACID2
5655	IR Brix Meter × Brix Acidity Meter (Apple) PAL-HIKARi 5 + PAL-BX|ACID5
5662	IR Brix Meter × Brix Acidity Meter (Asian Pear) PAL-HIKARi 12 + PAL-BX|ACID12

Contents

Part Name	Quantity
Digital scale	1
100 mL Beaker (PMP)	1
1 mL Measuring spoon	1

Pocket Brix-Acidity Meter Specifications

Measurement Range	PAL-BX|ACID2	Brix: 0.0 to 60.0%, Acid: 0.10 to 4.00%
	PAL-BX|ACID5	Brix: 0.0 to 60.0%, Acid: 0.10 to 4.00%
	PAL-BX|ACID12	Brix: 0.0 to 60.0%, Acid: 0.05 to 2.00%

For more specification information, contact ATAGO.

Uses


Orchard


Customs inspection/import


Market

Grocery store

Besides aforementioned, pâtissier chefs who uses fruits as an ingredient,
gardening hobbyist that enjoys home gardening and may more can be use it.

Q Does fruit need to be prepared?

A No need to cut, strain, or squeeze fruit.

Q Does skin color affect measurement? (Red and green apple)

A Color does not affect.

Q What to look out for when storing.

A Make sure to dry the cushion well. Take out batteries when planning to not to use for a long duration of time.

Q Battery life?

A About 4,000 times (AAA alkaline batteries x 2).

Q Can measurement be taken for fruits during its growth?

A Measurement can be taken while the fruit is on the tree. Carefully place the cushion on the fruit not to let it fall off the branch.

Q Measuring the same fruit, the value is different.

A Brix level of fruit differs depending on such factor as exposure to sunlight and area of the fruit. This unit measures the area where the sample stage is placed against. *Please reference “ When measurement value does not seem to be correct…”

Q What fruit can be measured?

A PAL-HIKARi is a fruit specific instrument with model for each fruit.
*Please reference pg.16 “Future Planning.”

Q How do you calibrate?

A PAL-HIKARi is designed to require no calibration. (Equipped with offset feature. Please reference pg.3.)

Q I would like to measure the sugar content of processed products such as jams.

A Packaged sets products are available that comes with pocket Brix meter (PAL-0) and pocket Brix-acidity meter.

When measurement value does not seem to be correct…

POINT External light interference

Avoid light from entering the sample stage. Light entering the sample stage will cause measurement error and cause greater margin of error.

POINT Effect of fruit temperature

Be sure to take measurement after allowing the sample fruit to acclimate to PAL-HIKARi.
*Place them under same condition for a period of time.

POINT Effect of contact between the sample stage and fruit

Properly place the sample stage of PAL-HIKARi against a fruit. Improper contact will allow external light to enter.

POINT Effect of water droplet, soiled area,and condition of the fruit

Avoid fruit’s surface with water droplets or soiled area. Correct measurements cannot be achieved for soft and spotty fruits caused by elapsed time since harvesting.