Nondestructive Brix Meter N－1

User manual・Warranty

Mechatronics Inc.

Ver. 1.5

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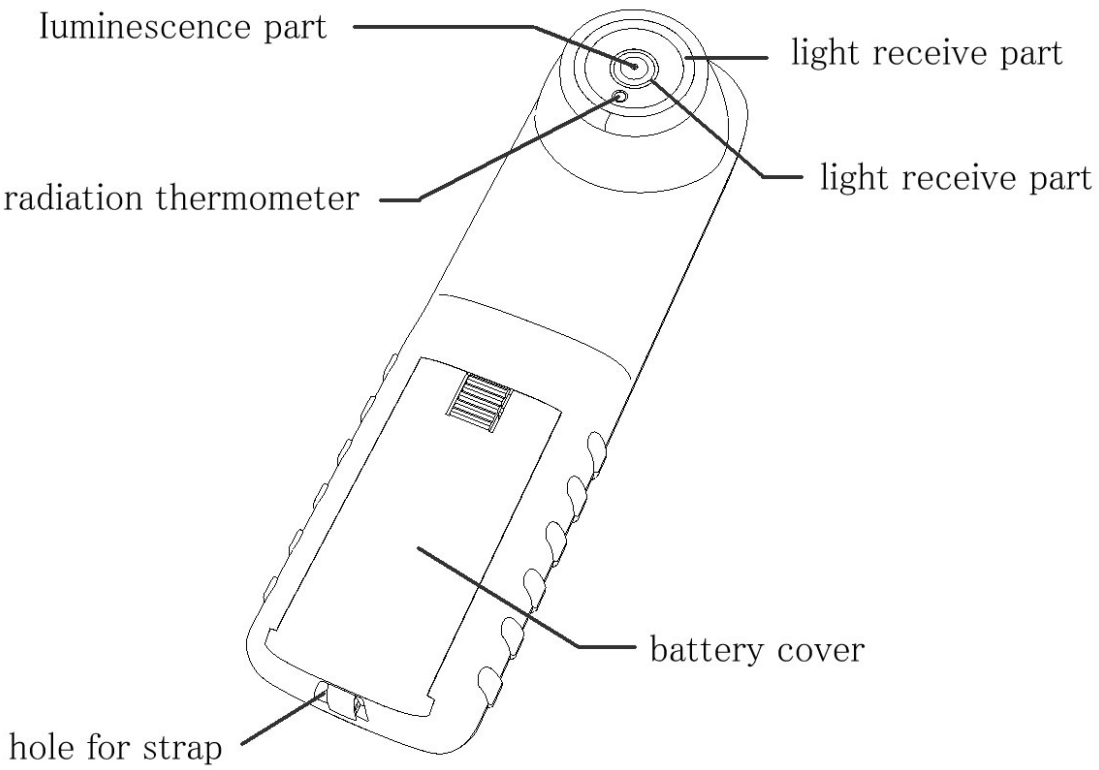
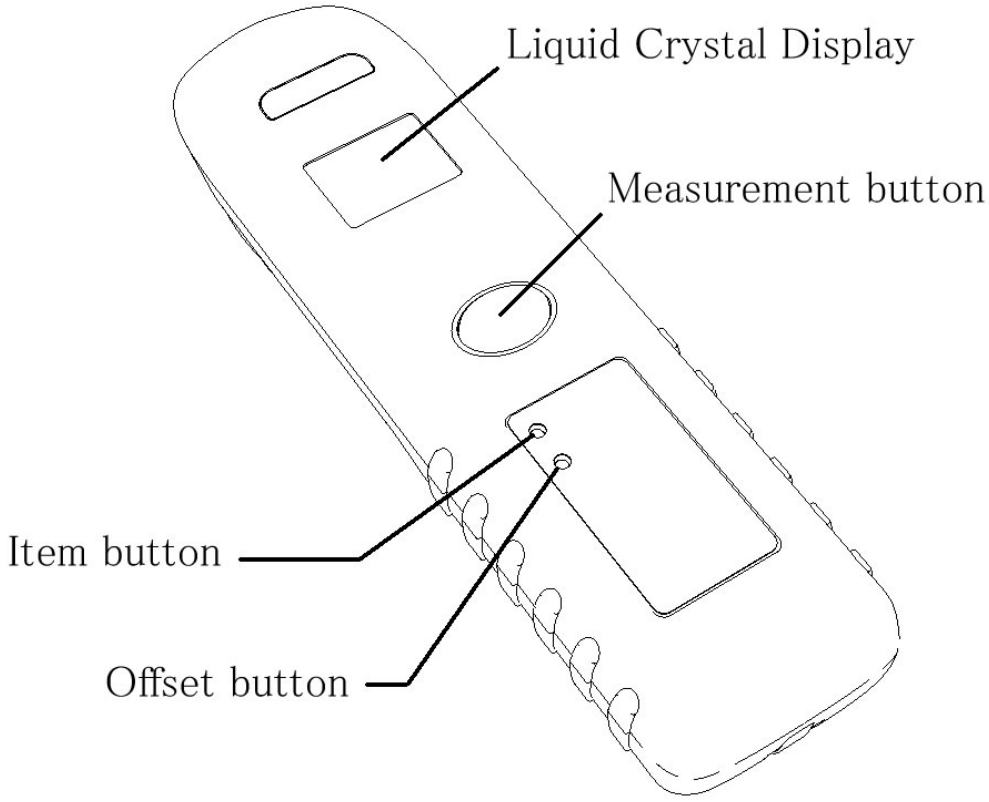


【Product Features (Liquid Crystal Display Side)】



※The item button and the offset button
can be pressed with the tip of a pen.

【Measurement Procedure】

Hold the measuring head against the fruit and press the Measuring Button for 2 seconds.

The device will beep once when beginning measuring and twice when finishing measuring, then the results will show on the screen.

Hold the measuring head straight against the fruit as shown in fig. 1. There will be a larger error if the measuring head is tilted like fig. 2 or fig. 3.

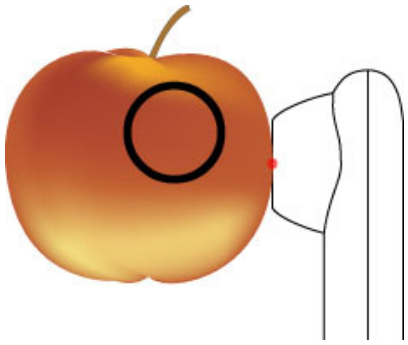


Fig. 1

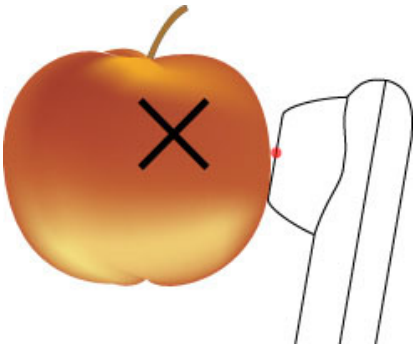


Fig. 2

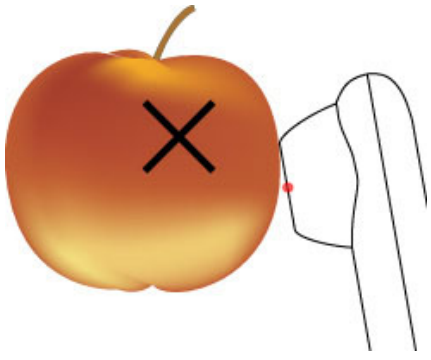


Fig.3

【Warning】

1. Depending on the method of cultivation and the breed, there may be variations in the readings. Always adjust the value in comparison with a refractometer.

2. The error is larger when the fruit has just been taken out of a refrigerator because of temperature differences with the skin and the inside. Please conduct measurements once the fruit has been to the surrounding temperature. 80mm - 90mm fruit should be ready for measurements after 5 - 6 hours.

3. Please conduct measurements 1 hour after moving the N-1 to a environment with a large temperature difference to avoid inaccurate measurements.

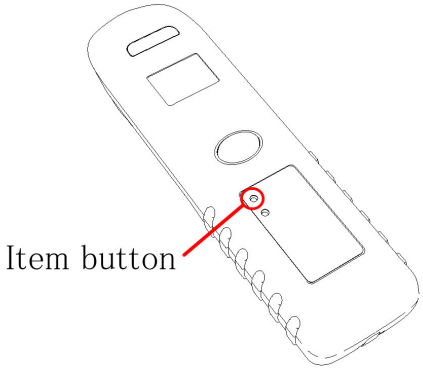
4. When there is not sufficient contact between the measuring head and the fruit, measurements will be inaccurate. Please practice until the data can be repeated consistently.

5. It is most accurate with ripe fruit. Unripe or overripe fruit will not produce accurate readings.

6. The measurement will be canceled if the button is not held until the device beeps twice.

7. Avoid touching the measuring area.

【Item Selection】



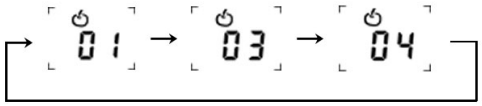
Press the item button to enter item selection mode. The item button can be pressed with the tip of a pen.

Instructions for item selection are listed below.

1. When the item button is pressed once there will be 3 beeps and the device will enter item selection mode. the items that have been set will be displayed. *● will be flashing on the display when in item selection mode.

2. The display will change as follows every time the button is pressed. *Only the item numbers that are supported by the device will be displayed.

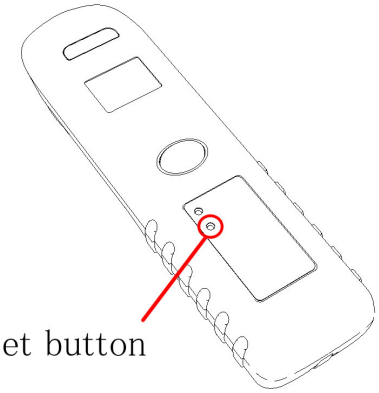
(Example)



3. To select an item, display the wanted item and wait for 10 seconds. There will be a long beep to notify the change in setting. The device will turn off automatically and enter measuring mode.

*Press the offset button while in item selection mode to enter offset setting mode for the selected item.

【Offset Setting】



If the offset button is pressed, it will enter offset setting mode where sugar content measurement deviations can be corrected.

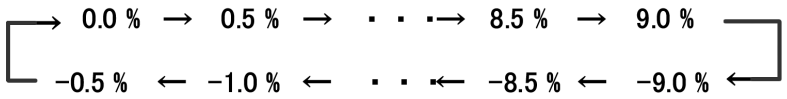
The offset button can be pressed with the tip of a pen.

In the offset setting mode, the offset value can be set up to ±9%, with 0.5% increments. The procedure is as follows.

1. When the offset button is pressed there will be 3 short beeps, and it will enter off set mode for the selected item. The offset values will be displayed.

*● will flash on the screen while in offset setting mode,

2. The screen will change as follows every time the offset button is pressed.



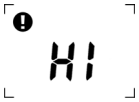
3. To set an offset value, display the wanted value for 10 seconds. There will be a long beep when it finishes. The device will automatically turn off and return to measuring mode.

*If the item button is pressed while in offset mode, the offset value will be updated and it will enter item selection mode.

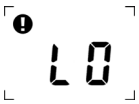
【Error Types】

Low Battery. Flashes when low, lights up when dead. Please replace battery.

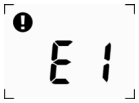
Sensor Saturation. Occurs in bright light environments. Please avoid direct sun light.



AGC saturation error. It is too bright because the measuring head does not have sufficient contact with the fruit, etc.

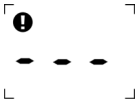


LED breaking error. Can occur when there is not a subject to be measured.



Synchronous noise error. Can occur when there is a interfering light source (fluorescent light) emitting the same frequency light.

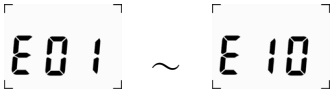
*This error can occur when the battery life is low. If it occurs frequently, please change the batteries.



Invalid measurement error. Caused by insufficient contact, movement during the measurement, etc.

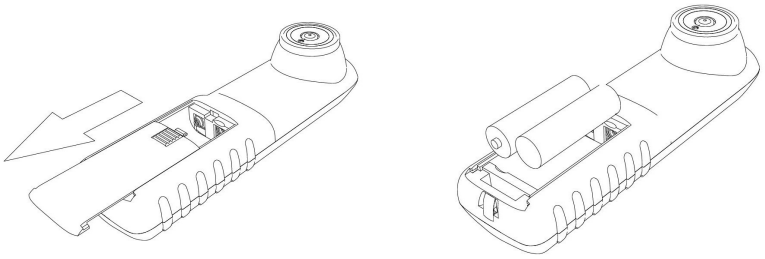
*If the device beeps repetitively during a measurement, it is detecting movement or shaky hands. Once it stabilizes a proper measurement can be taken.

*Other Errors



These errors will generally not occur, however, if they do, please contact the Sales agent.

【Battery Replacement】



Remove the battery lid shown in the instructions above and insert AA batteries in the proper direction.

* If it is not in use for long periods of time, remove the batteries.

【Checking Supported Items】

When the measuring button is pressed during measuring mode, an icon,  , will appear on the screen. This icon shows the item supported by your device. The numbering of the fruit is shown below.

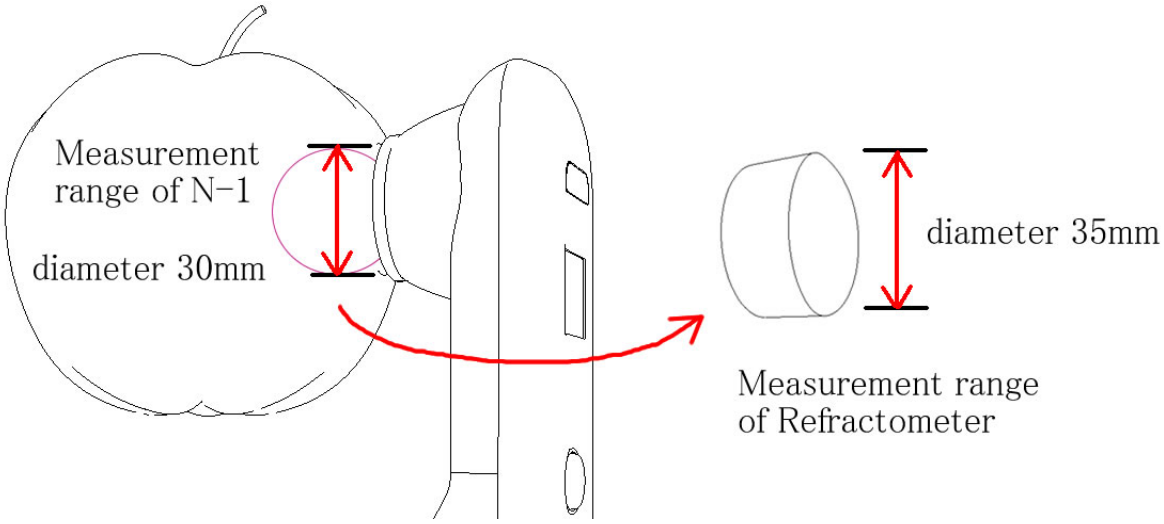
01	102	202	03	04	05
Apple	Green Mango	Ripe Mango	Peach	Pear	Persimmon

*Items can be added. To check the newest items please visit our homepage. (http://mechatronics.co.jp)

The item supported on your N-1 is

【Range of Measurement】

The N-1 is measuring a circular area with a diameter of approx. 30mm starting at the center of the measuring head. It is determining the average sugar content within the area, not the whole fruit. For example, for an apple, there should be about 0.5 to 1 percent variation throughout.
The sugar content formula by extracting a cylindrical shaped sample with diameter 35mm and height 15mm and crushing it. The brix sugar content is determined from this test. The N-1 is calibrated from these measurements.



【Honey Dew Measurement for apples】

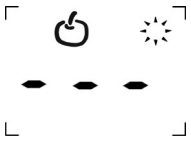
Honey Dew Measurement is only available for N-1 devices that have the honeydew measuring function.

This option can be added after purchase.

When the sugar content is measured, it will display the sugar content first, then the honeydew condition in 3 stages.

High chance that it contains honeydew

Possibility of containing honeydew



No honeydew

※ honeydew measuring is for Fuji and Sanfuji Apples. Additionally, the honeydew measuring tends to be less reliable than the sugar content measurement. Please make a few measurements across the circumference of the apple and take an average to get an idea of the honeydew condition.

Offset Setting Principles

What is an offset?

It is the addition or subtraction of a particular value from a normal measurement result.

Why is it necessary?

To remove a definite difference between the result of measurement using N-1 saccharimeter against that using a refractometer-type saccharimeter (destructive saccharimeter).

The deviation of N-1 saccharimeter is adjusted using actual fruits before shipment.

However, there may be certain levels of deviation due to the differences in harvest timing and cultivation method used by different farmers.

Setting Examples

Fruit	N1 measurement result (%)	Measurement result of a refractometer-type saccharimeter (%)	Value deviation (%)
	11.6	12.8	−1.2
	9.7	10.6	−0.9
	10.6	11.2	−0.6
	11.7	12.5	−0.8
	9.5	10.7	−1.2

The average deviation of the values measured by N1 to those measured by a refractometer-type saccharimeter can be obtained by adding all the “value deviations” in the table and divide it by the number of fruits.

Average value deviation	−1.2 + −0.9 + −0.6 + −0.8 + −1.2 = −4.7 −4.7 ÷ 5 = −0.94

The values measured using N-1 in the above example was found to deviate by -0.94% on average from that measures using a refractometer-type saccharimeter (actual sugar content).

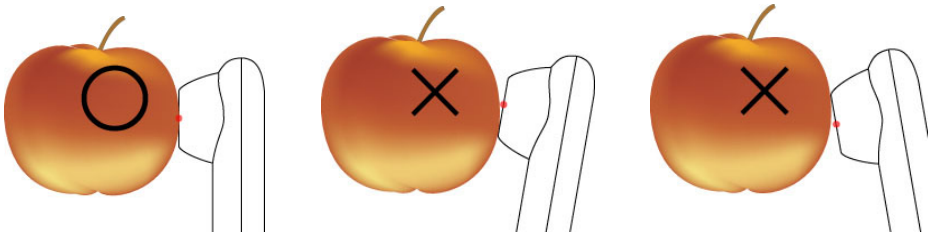
Since the offset setting of N-1 can be done in 0.5% increments, in this example, it is better to set it at +1.0%. Using more fruits for checking the

value deviation will produce better adjustment accuracy.
For N-1 offset setting, please refer to “Offset Setting” (6P) page.

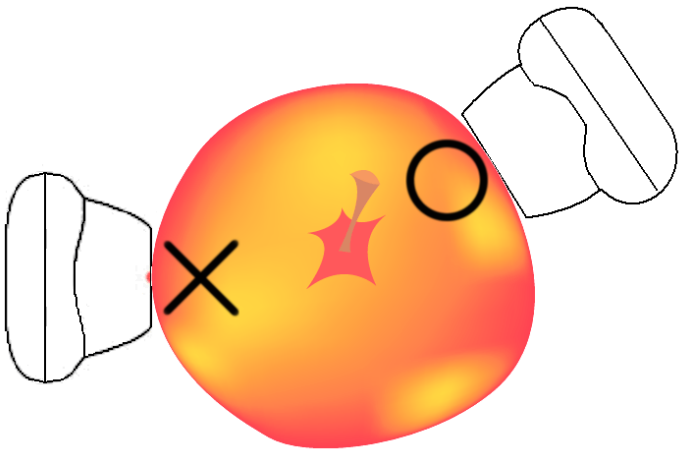
Notes on Measurement

*The operation method and notes are explained in detail in the attached DVD. Please watch it before using.

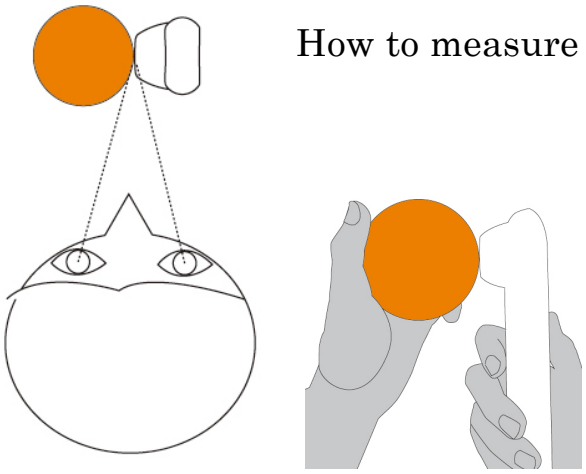
○Measure by placing the measurement probe straight on the fruit



○Measure on a relatively flat surface

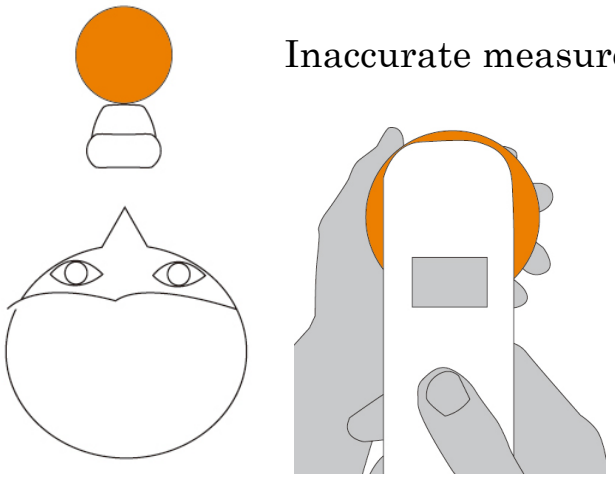


○Confirm the contact surface of the measurement head while measuring
(Measure by bringing the center part of the head into close contact with the fruit)



How to measure accurately

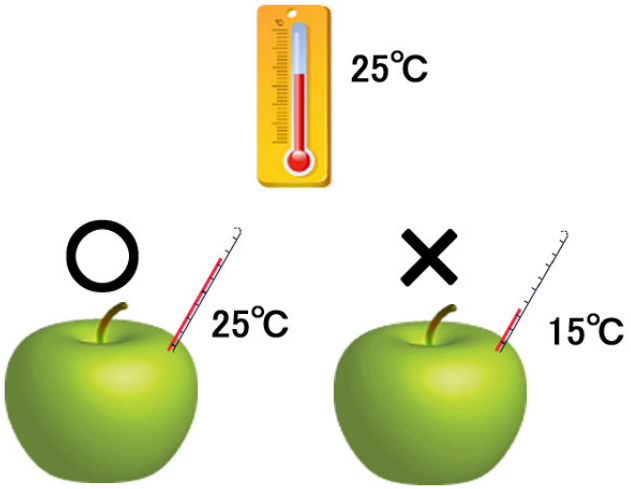
Measurement can be done while looking at the contact point and making sure that the central part of the measuring head directly contacts with the fruit.



Inaccurate measurement

If the measurement is done by looking at the display directly, as shown in the above figure, the center part of the head may not be in close contact with the fruit surface.
The measurement error will increase if the central part of the head is separated from the fruit surface.

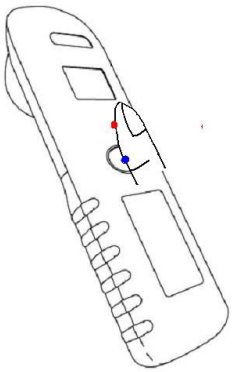
○ Unwanted movement is minimized



Measure the fruit at the same temperature with the surrounding, as shown in the left figure.
(Leaving a refrigerated fruit at room temperature for about half a day will improve the measurement accuracy.)

○ Movement due to pressing can be minimized

Place the tip of your thumb to touch the case, not the button.
By pushing the button using the part slightly under the tip of your thumb, the movement due to pressing can be minimized and a stable measurement can be performed.



【Specification】

	Specification	Remarks
Measurement Method	Thee-Fiber-Based Diffuse Reflectance Spectroscopy (TFDRS)	Determines the sugar content though the absorbance of light LED is used as the light source
Power supply	AA Battery×2	Can measure once every 5 seconds, up to 5000 times (when using alkaline batteries)
Dimensions	181mm×52mm×42mm	(Length×Width×Height)
Weight	200g	Includes Battery Weight
Operating temperature	15℃～30℃	Needs a stable temperature
Accessories	Case, etc.	Case Dimensions (Length without Handle×Width×Height) 210mm×180mm×70mm User Manual, Explanatory DVD, AA Battery×4、 Hood (Use when an error occurs because of excess brightness)
Warranty	1 year warranty 5 year warranty period	Excludes cases where there is clear signs of misuse. Free of charge if there is a problem with manufacturing. (It may be possible to repair after the 5 year period, so please contact us)

This product is under a license of Japanese Patent No. 3903147 owned by the Nagasaki Prefecture, and developed by the technical cooperation of the Industrial Technology Center of Nagasaki.

【Warranty】

◇Buyer

◇Model　　N－1 Nondestructive Brix Meter

◇Serial number

◇Supported Item

◇Shipping Date

◇Warranty Period

◇Warning

- The free warranty will last one year after shipping. However, shock, water damage and other signs of clear misuse will not be supported by the warranty even if it is within the warranty period.
- The device will be repaired for free even if the warranty period is past if there is a problem stemming from manufacturing.
- The Paid repair period is 5 years after shipping, but if there is a stock of parts, the product can be repaired past this period.

【Contact】

Sales agent : FUJIHIRA INDUSTRY Inc.
Address：6-11-6 Hongo, Bunkyo, Tokyo, 113-0033, JAPAN
TEL：0081-3-3812-2270
FAX：0081-3-3812-3663
E-mail : liu.ha@fujihira.co.jp
URL : http://www.fujihira.co.jp

Manufacturer : Mechatronics Inc.
Address：4-4-26 Setogoshi, Sasebo, Nagasaki, 857-0134, JAPAN
URL: http://www.mechatronics.co.jp