

Palette

- PR-32 Cat.No.3403

INSTRUCTION MANUAL



When a malfunction is suspected!

Malfunctions often come from low battery.
Check the battery first, and if the battery is low,
replace it with a new battery



Caution

Be sure read this the caution before before using the instrument.

Durability of the casing of this instrument

The casing of this instrument is made of "ABS resin".

- If this instrument is exposed to steam, there is a fear that the casing of this instrument possibly suffers damage such as a crack.
- Therefore, keep this instrument away from steam. Since there is a possibility that ABS resin is damaged by the following solvents, give attention to this matter.

Solvents by which ABS resin is apt to be damaged

<ul style="list-style-type: none">• Aqua regia• Chromic acid• Chlorosulfonic acid• Hydrobromic acid• Nitric acid• Hydrofluoric acid anhydrous• Sulfuric acid• Phosphoric acid• Ethyl acrylate• Butyl acrylate• Ethyl acetoacetate• Acetophenone• Benzyl benzoate• Ethyl benzene• Ethyl oxide• Ethylene diamine• Ethylene chlorohydrin• Epichlorohydrin• Ethyl chloride• Benzyl chloride• Methyl chloride• Chlorinated solvents• Xylene	<ul style="list-style-type: none">• Cresol• Chloroacetone• Chlorotoluene• Chloroform• Acetic acid• Amyl acetate• Isopropyl acetate• Ethyl acetate• Butyl acetate• Propyl acetate• Methyl acetate• Diphenyl oxide• Diisopropyl ketone• Carbon tetrachloride• Dioxane• Cyclohexanone• Dichlorobenzene• Dibutyl phthalate• Dimethyl formamide• Dimethyl aniline• Phenol• Ethyl mercaptan• Tetrahydrofuran	<ul style="list-style-type: none">• Trichloroethylene• Toluene• Ethylene dichloride• Methylene dichloride• Nitroethane• Nitropropane• Nitrobenzene• Nitromethane• Perchloroethylene• Fluorobenzene• Freon• Methyl methacrylate• Methyl isobutyl ketone• Methyl ethyl ketone• Chloroacetic acid• Monochlorobenzene• Chlorine liquide• Thionyl chloride• Sodium peroxide• Bromine• Benzine• Lacquer
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Note : Since there is no guarantee that ABS resin will not be damaged by some solvent other than the above ones be careful with similar solvents.

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1- Precautions on use (Be sure to read the following before use)

Preface



Thank you for your purchase of ATAGO’s Digital Refractometer PR-32. For correct operation of the PR-32 and accurate measurement with it, carefully read the following instructions before using the unit and keep this manual at hand for future reference.

Among the contents of this manual, “Precautions for Safety” requires most careful reading because there are many important matters for safety appearing in that paragraph.




Precautions for Safety—Make sure to follow the instructions mentioned below.

To take precautions against possible accidents such as harming and damaging persons and properties, this manual contains important instructions with warning and caution markings. The warning and caution marks appearing in this manual express the following meanings. We hope you understand those marks well and read such important instructions very carefully for safe use of this refractometer.

Meanings of marks and words

	Warning	Instructions with this mark and word are very important) for safety. If user incorrectly handles and operates the refractometer ignoring the instructions with this mark and word, it may result in decease or serious injury of the user.
	Caution	Instructions with this mark and word are very important for safety. If user incorrectly handles and operates the refractometer ignoring the instructions with this mark and word, it may result in injury of the user and physical damage to the refractometer and other matters

Meanings of symbolic marks

	This mark expresses warning (cautionary) matters. Warning in detail appears nearby or in this mark
	This mark expresses forbidden actions. Forbidden action in detail appears nearby or in this mark.
	This mark expresses must-do actions. Must-do action in detail appears nearby or in this mark.



Warning

- When using this instrument for measuring matters harmful to humans, very carefully do it with gloves and a proper mask as well as with a good knowledge of the characters of the matters



- if the refractometer is dropped or shocked strongly immediately ask the dealer or our distributor to inspect it.



- Don't disassemble repair modify the refractometer by yourself.



Caution

- Don't wet the refractometer except the prism surface with water or sample liquid unreasonably. If the refractometer gets wet excessively, it may



- If a hot and strong acid sample is measured by the refractometer, the prism may be corroded by acid and the refractometer may consequently fail in measurement



For handling this refractometer (continued)

- Don't tap or pick at the prism surface with a metal spoon, tweezers, etc., because the prism surface is made of optical glass. If the prism surface is scratched, the refractometer may fail in measurement



- When measurement is complete, wipe up sample from the prism surface and its surroundings with soft tissues moistened with water first, and then wipe the wet parts with dry tissues to dry them up



- After measurement of a sample of a high molecular compound, oil and fat, etc., wipe the prism surface with tissues moistened with alcohol or neutral detergent first and then wipe it up again with dry tissues to dry up.



- When transporting the refractometer, make sure to put it in the case which the refractometer was initially contained in.



- When measurement is made with this refractometer at a place which is exposed to the direct sunlight or strong external light (under the lamp, etc.), cover the sample stage of the refractometer with your hand because there is a fear of making an error in measurement



- First of all, carefully read this instruction manual to know the function and operating method of each part of the refractometer.
- Before using this refractometer, check to see if each part normally operates or not.
- Before starting measurement, make sure to perform check and adjustment work such as calibration (zero setting), etc., according to the instructions.

- if the refractometer is used for purposes other than the original uses (for measurement of sugar content [Brix %], concentration of solution), ATAGO won't be liable for any breakdown or damage resulting from such the use.
- Keep it in mind that the prism to contact with samples falls under the expendable supplies and it will be charged for replacement.
- ATAGO won't be liable for any loss and damage of the material that is sampled for measurement with this instrument at all.

Handling of battery



Warning

- Make sure to use a specified battery or that supplied with the refractometer as an accessory. When loading the refractometer with a battery, pay heed to the polarities of the battery. If a battery out of the specification is used, it may cause smoke or fire because some batteries are different in the voltage and polarities.



Caution

- Don't heat, shortcircuit, burn a battery or take it apart. If done so, it may cause burst or fire.



- When keeping or disposing a battery, protect both poles with insulating tape, etc.. If a battery is kept or disposed as the poles are not covered, it may cause shortcircuit, burst or fire.



Environmental conditions

- Use this refractometer in a place where it is lower than 2,000m above sea level.
- Use the PR-32 at an ambient temperature of 5°C to 40°C.
- Use this refractometer at a humidity lower than 90%.
- Don't put this refractometer at a place where it is directly exposed to the sunlight or the temperature is extremely high (higher than 40°C), in a closed car, near the heating equipment, etc.
- Avoid sudden change of the ambient temperature.
- Don't put the refractometer in a place where it is strongly shocked.
- Don't use the refractometer in a dusty place.
- Don't put the refractometer in a place where the temperature extremely goes down.
- Don't put the refractometer in an extremely humid place.
- Don't put a heavy thing on the refractometer or don't drop anything onto the refractometer.

In regard of handling the refractometer

- Avoid neither dropping the refractometer nor getting it shocked strongly.

Daily maintenance

- When the refractometer is soiled, clean it with soft cloth.
- Don't use benzine, thinner, etc., for cleaning.

2 Confirmation of package

Please confirm the following contents of the package immediately when the Unit is unpacked.

•	Digital Refractometer PR-32.....	1
•	Battery.....	1
•	Screwdriver (plate type).....	1
•	Instuction Manual (English version).....	1
•	Inspection Card	1

3 Name and roles of each part

(1) Liquid Crystal Display (LCD)

Measured values (Brix%) are displayed on the Liquid Crystal Display.

(2) Sample Stage

A prism on which sample is dripped is existing at the center of the Sample Stage. The stage is made of stainless steel.

(3) Zero Setting Switch

Press the Zero Setting Switch at zero setting of the Unit.

(4) START/OFF Switch

Press this switch to start measurement. Note that the measured value goes off if this switch is kept pressed for over 2 seconds.

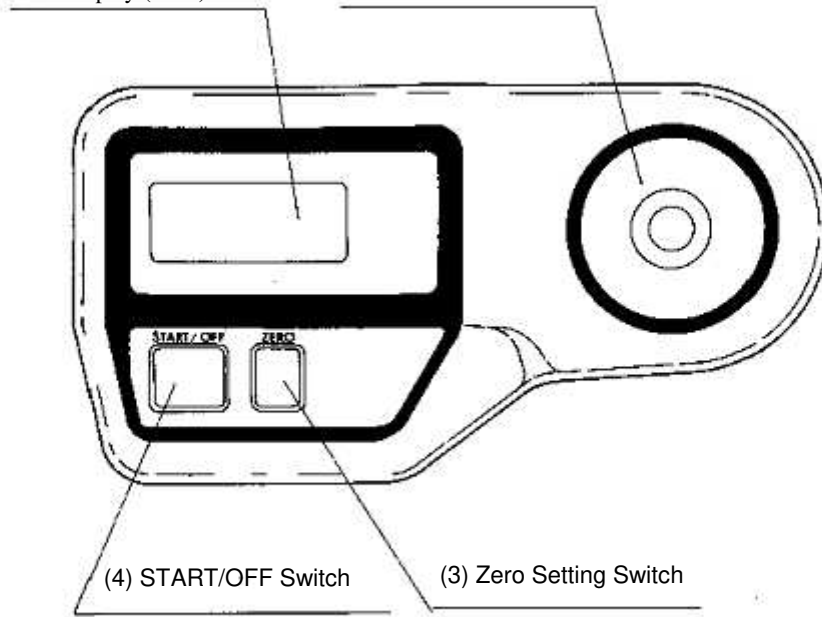
(5) Battery Cover

Remove this cover to set or replace the battery (006P).

Fag 1

(1) Liquid Crystal
Display (LCD)

(2) Sample Stage

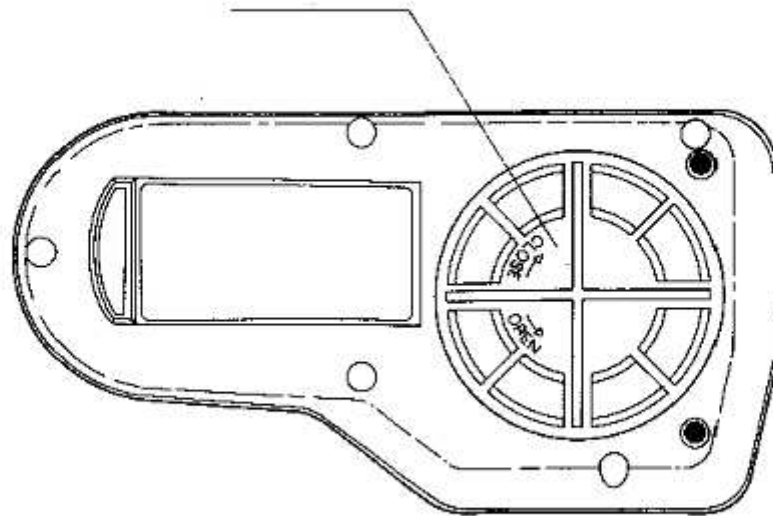


(4) START/OFF Switch

(3) Zero Setting Switch

FIG 2

(5) Battery Cover



4 Insertion of battery

CAUTION

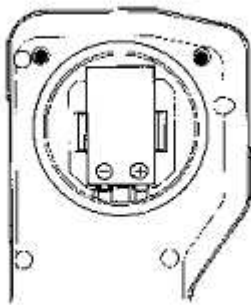
- When loading the refractometer with a new battery carefully do it not to make a mistake in connection of the positive(+) and negative(—) poles of the battery. If they are wrongly connected it causes a trouble or damage of the refractometer.
- When closing the battery cover after battery replacement make sure not to turn it with the screwdriver supplied together with the refracto- meter but to do it with fingers. If the screwdriver is used to close the battery cover the battery cover is closed too tightly and it is hard to open it again.

(1) Turn left the Battery Cover by the screwdriver of accessories as illustrated for opening. (Fig.3)

Fag 3



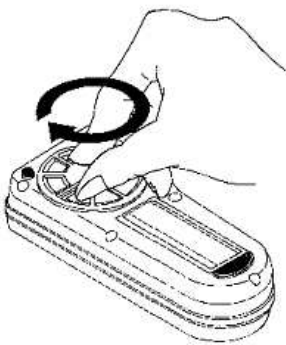
Fag 4



(2) Insert a battery correctly as to its polarity. (Fig.4)

Note:
Since the battery supplied as an accessory is just for operation test of the re- fractometer and will be dead in a compara- tively short time of operation, prepare a new battery for replacement early.

3Fig 5



(3) Turn right the Battery Cover by your bare hands for closing. (Fig.5)

Note:
Close the battery cover by your bare hands without using the attached screwdriver (one of accessories), otherwise the battery cover may be too tight to open

- Electronic circuits of the Unit turn on as soon as the battery is set. Thus, there is no power switch on this U nit.
- When the voltage of the battery is low after some time. purchase a new 006P battery and change the old battery with new one. Be sure to carry out zero setting when the battery is changed.
- It is recommended to use a 006P-size alkaline battery which is available on the market, because its service life is twice as long as that of an ordinary battery.
- Keep the battery removed from the I nit when the I nit is not to be used for a month or so. If the battery is kept inside, it will be exhausted in about 3 months even for a new battery.

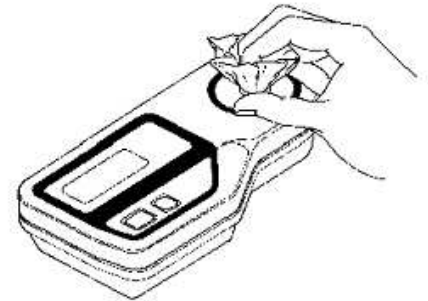
5 Zero setting

CAUTION

- The refractometer needs the “zero-setting”(calibration) before it is used for the first time in a day. Moreover, if the ambient temperature changes during the daily work with the refractometer, it needs the zero-setting again.
- The zero-setting is also needed whenever the battery is replaced.
- Don't use any metallic implement for dropping water on the prism, because there is a fear that metal goods possibly damage the prism surface.

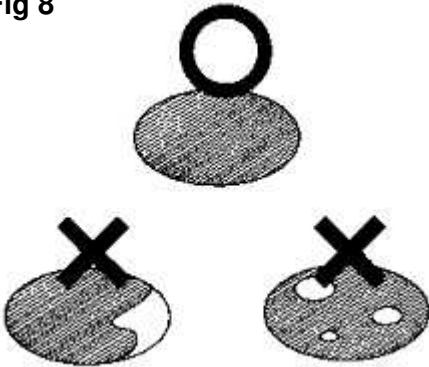
- (1) **Prepare distilled water or tap water.**
- (2) **Clean the Prism Surface. (Fig.6)**

3Fig 6

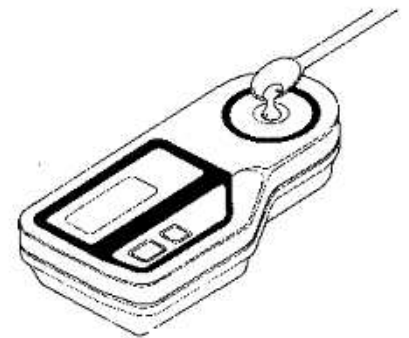


- (3) **Drip a few drops of water on the prism. At this time, make sure that water covers the prism surface completely. (Fig.7-Fig.8)**

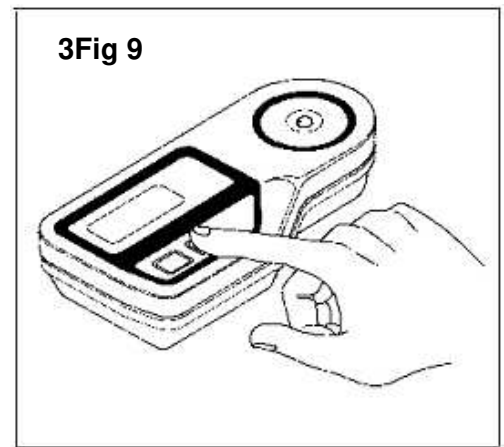
3Fig 8



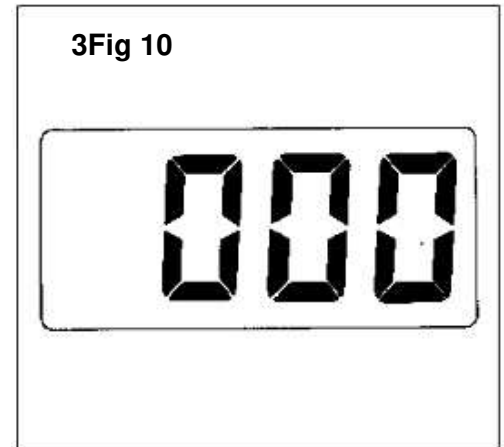
3Fig 7



(1) Press the Zero Setting Switch with finger tip. (Fig.9)



(2) “000” blinks two times on the LCD and then it is displayed continuously. (Fig.10)



*If the LCD displays a number other than “000”, repeat this Zero Setting procedure from the beginning again.

(3) The Zero Setting is now over. Wipe off the water on the Prism Surface completely with tissue paper. (Fig.11)



* Use tissue paper of which fibers do not come off.

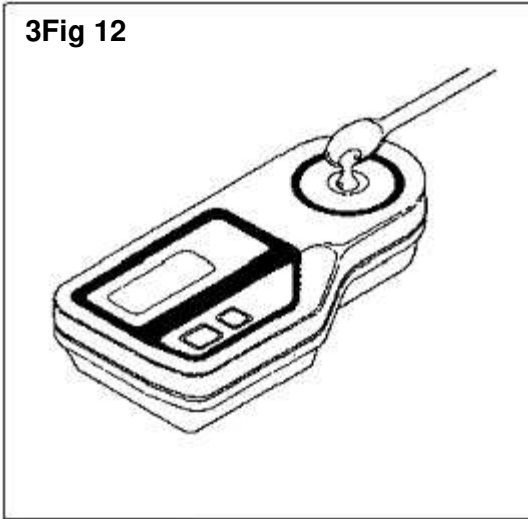
- The zero setting state of the Unit is maintained until the battery is exhausted or replaced.
- Carry out the Zero Setting when the battery is replaced.

6 Measurement on sample

CAUTION

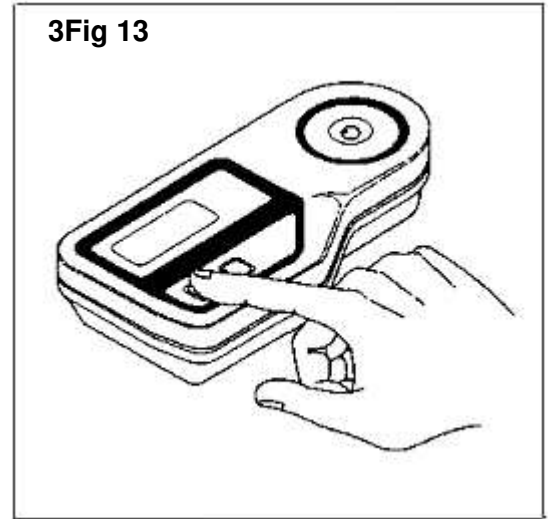
- When using this instrument for measuring solution containing substances harmful to humans make sure to do it most carefully with gloves and a proper mask as well as with a good knowledge of the substances and the solution.
- Don't use any metallic implement for sampling because there is a fear that metal goods possibly damage the prism surface.

3Fig 12



(1) Wipe and clean the Prism Surface, and drip sample on the prism.(Fig.12)

3Fig 13



(2) Press the START/OFF Switch.
(Fig.13)

3Fig 15



- (1) An arrow blinks two times on the LCD, and then Brix% (concentration of sugar solution) of the sample is displayed on the LCD. (Fig.14)
- (2) The value displayed on the LCD is maintained for about 5 minutes.
To turn off the display, keep the START/OFF Switch pressed for about 2 seconds.

3Fig 14



(3) Wipe off the sample, and wipe and clean the Prism and the Sample Stage with tissue paper moistened with water.(Fig.15)

7 Explanation of error messages

The PR-32 alarms erroneous or incomplete operation by error messages. The followings are kinds of error messages.

"AAA" Zero setting error (Fig.16)

- Water is not dripped on the prism surface and Zero setting is made in a state of the prism surface being exposed to the air.
- Zero setting is made with a sample.

3Fig 16



"LLI_" Sampling error (Fig.17)

- No sample exists on the prism surface or measurement is made in an incomplete condition.

3Fig 17



"HHH" Range over error (Fig.18)

- A liquid of high concentration exceeding the measuring range is measured.

3Fig 18



"Lo" Battery error (Fig.19)

- When this error message is displayed in either zero setting or start (measurement), it indicates flickering 3 times, that the battery is used up. Replace the battery with new one.
- Immediately before the battery is used up, the instrument may perform erroneous operation, without displaying the error message "Lo". In such a case, replace the battery with new one.

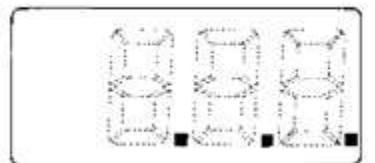
3Fig 19



"..." Temperature error (Fig.20)

- A sample at a temperature, lower than 5°C or higher than 40°C is measured.
- In such a case, the measurement value is incorrect.

3Fig 20



8 Display unit of PR-32

(1) The PR-32 is designed to measure concentration of liquids using the refraction of light.

- The "refractive index" is a unit which expresses the refraction of light. Individual substances have a value of refractive index of their own and the following substances have a value of refractive index at 20°C as shown below.

Air.....I	
Water.....	1.33299
Salad oil.....	1.47
White plate glass.....	1.52
Diamond.....	2.42

- The refractive index of water solutions increases gradually from 1.33299 of water as dissolved components increase.
- Scale of PR-32 is set up by unit of weight % of cane sugar dissolved in water. This is called Brix(%) (**Brix percentage**).
- In case 10g cane sugar is dissolved in 100g cane sugar solution, for example, this solution is expressed by Brix 10%.
- There exists a fixed relation between this Brix(%) and the aforementioned refractive index and the relative expression is determined by ICUMSA (International Committee of Uniform Method of Sugar Analysis).
- Based on this relative expression, PR-32 converts the refractive index of sample (measured result) to Brix(%) and displays its value.

Table 1 Table of Refractive Indexes and Brix(%)

1974 ICUMSA

0/o	n _D ⁰	o/o	n _n ^{20D}	o/o	n _n ^{20D}	o/o	n _n ^{20D}	o/o	n _n ^{20D}
0	1.33299	7	1.34325	14	1.35408	21	1.36551	28	1.37758
1	1.33442	8	1.34477	15	1.35568	22	1.36720	29	1.37936
2	1.33586	9	1.34629	16	1.35729	23	1.36889	30	1.38115
3	1.33732	10	1.34782	17	1.35891	24	1.37060	31	1.38296
4	1.33879	11	1.34937	18	1.36054	25	1.37233	32	1.38478
5	1.34026	12	1.35093	19	1.36218	26	1.37406		
6	1.34175	13	1.35250	20	1.36384	27	1.37582		

(2) Aqueous Solutions Other Than Sugar Solutions

- The refractive index of aqueous solutions differs depending on substances dissolved in water as individual substances have the refractive index of their own.
- Conversion is needed for aqueous solutions other than sugar solutions. Table 2 shows conversion values of main substances.

Table 2 Conversion of Concentration of Main Substances in Aqueous Solutions and Brix(%)

Reading of PR-32 (Brix(%))	Ethylene glycol (V/V) '	Glycerine (W/W)	D.M.F. (W/W)
0.0	0.0	0.0	0.0
5.0	7.4	6.2	5.8
10.0	14.7	12.5	12.1
15.0	22.1	18.8	18.8
20.0	29.7	25.0	25.7
25.0	37.8	31.3	32.8
30.0	46.4	37.5	40.0

(3) Solutions Mainly Containing Sugar As Food

- Fruits mainly contain sugar and they also contain acids and pectin. Brix(%) is generally used as it is as soluble solid content (%).
- The above practice is also applied to ketchup, jam and marmalade.
- It is well known from old days that in the case of juice (texture liquid) squeezed from plants, Brix(%) satisfactorily agrees with percentage of soluble solid contained in them.

(4) Water Soluble Chemical Liquids for Industry Use

- Concerning cutting oils, quenching oils, wire drawing oils and fire extinguishing chemical solutions, the conversion table is prepared by converting percentage of diluted liquid against undiluted liquid to Brix(%). In this case, V/V (volume/volume) is used in place of weight %.

Making of original conversion graph (Example)

- Assuming that the range of concentration to measure and to control is 0 to 20%, confirm which unit is used for measurement, g/100g, g/100ml, or ml/100ml.
- Prepare 0% (water in general), 10% and 20% dilute solutions with a balance (electronic balance), mess cylinder, pipette, etc.

Note: In the case the range of concentration to measure and to control is beyond 0 to 20%, prepare three kinds or so (including water of 0% concentration) of dilute solutions appropriately for the measuring range.

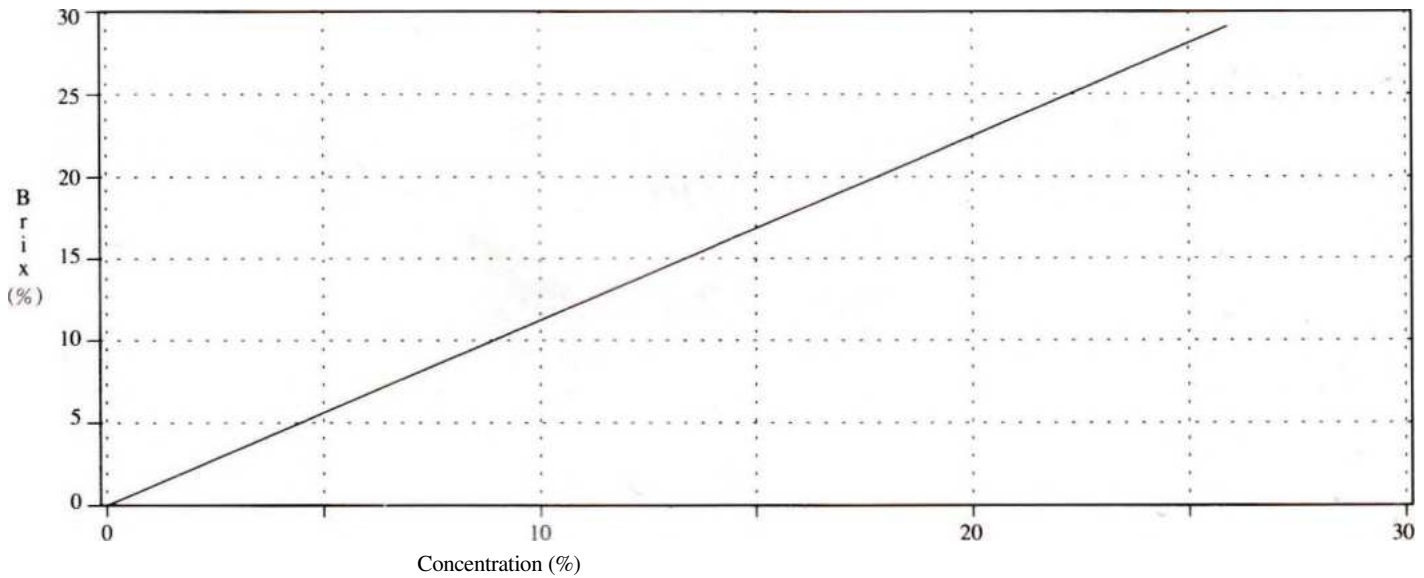
- 3) Measure the Brix) of the respective dilute solutions with this refractometer.
- 4) Assume that the values shown in the Table are obtained as the respective measurement results.

Concentration(%)	Brix(%)
0.0	0.0
10.0	12.0
20.0	23.0

Table 3

g/100g

- 5) According to the values obtained by the measurement, a graph can be drawn as shown below.



- 6 The above graph can be used as a conversion table (measuring index).

(5) Automatic Temperature Compensation of PR-32

The automatic temperature compensation of PR-32 is performed based on the temperature detected on the side of the prism by a platinum resistance thermometer (Basic temperature 20°C).

The temperature compensation is accurate therefore when the temperature of the sample on prism is the same as that of the prism. That is, the PR-32 is designed for use with water for zero adjustment and measurement samples which are in the same environment as that of PR-32. The cases listed below cause a temperature difference between prism and sample, and it is not possible to achieve accurate temperature compensation:

- Measurement of heated samples
- Samples from other environment with different temperature
- Samples taken from cooled processes
- Refrigerated samples

At measuring those samples listed above, drip a sample on the prism of PR-32, and wait for a while to eliminate temperature difference before performing the measurement.

9 Preparation of standard sugar solution and testing

Make sure to inspect the refractometer periodically (monthly inspection is recommended) in order to check to see if it indicates measurement values correctly or not.

Besides the periodical inspection, check the refractometer whenever it is strongly shocked and it indicates unusual values.

For inspection of the refractometer, use the standard sugar solution besides water. The standard sugar solution can be prepared according to the following procedure.

(1) Preparation of standard sugar solution of 20% concentration

When preparing the standard sugar solution, make sure to do it in a room whose temperature is $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$.

1) Necessary things

- Sucrose (highest quality): 20g or more
- Distilled water: 80g or more
- Direct indicating balance (capable of measuring 200g or more, accuracy: $\pm 0.01\text{g}$)
- Glass or plastic beaker (capacity: 100ml)
- Plastic spoon

2) Preparing procedure

- a. Put the beaker on the balance and adjust the balance indication to 0.00g.
- b. Put 20g of the sucrose in the beaker.
- c. Pour 80g of distilled water into the beaker so that the total of the sucrose and distilled water amounts to 100g.
- d. Take the beaker out of the balance and stir the mixture so as to dissolve the sucrose in water completely.

3) Cautions on preparation

- The Brix scale(%) of the refractometer indicates measurement values at a unit of W/W (weight/ weight) %.
- It is the best to prepare 100g of the standard sugar solution as a whole. (If it is less than 100g, it increases relative error in measurement.)
- The prepared standard sugar solution must be kept in a sealable vessel.
- Purchase sucrose at the nearest reagent store.

(2) Check of refractometer with standard sugar solution

- 1) Prepare the refractometer and set it up for measurement according to the instructions.
- 2) Calibrate ("zero-setting") the refractometer with distilled water that has been left at the room temperature.
- 3) Measure the Brix degree(%) of the standard sugar solution. Repeat measurement 5 times or so to obtain an average value.
- 4) When the refractometer reads a value that is the same as the standard sugar solution or different from it in a range of $\pm 0.2\%$, the refractometer normally works. If it reads a value with difference of $+0.3\%$ or more, examine the purity of the sucrose, concentration and preparation of the sugar solution, measurement manner, etc., once again.
- 5) If there is an error of $\pm 0.3\%$ or more observed in the measurement result after re-examination and correction of the above-mentioned conditions, immediately contact the dealer.

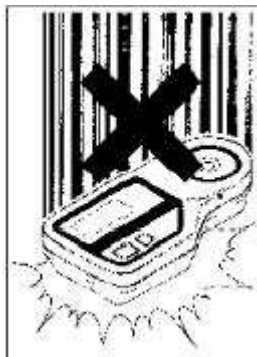
10 Storage and maintenance

After use, wipe if a sample adhering to the prism surface and adjacent area with tissue paper wetted with water and further remove moisture completely with dry tissue paper.

When storing this instrument, avoid a damp place or a place which is exposed to the direct sunrays. Dampness will cause blurs on the optical system or it will gather mold and direct sunrays will deform the casing disabling the instrument from performing measurement.

Because the casing is made of plastic it is strictly prohibited to use organic solvents (paint thinner Benzene gasoline or the like

CAUTION

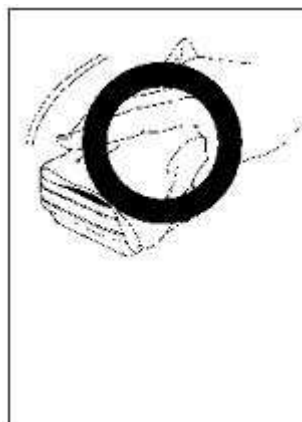


Never let the Unit fall or give shocks to the Unit

CAUTION

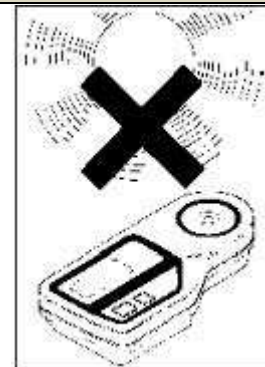


Never clean the Unit using a petroleum solvent



When the body gets wet, wipe off the moisture with dry cloth

CAUTION



Do not leave the Unit under direct sunshine and close to a heat source

11 Specifications of PR-32

	PR-32
Measuring range	Brix0.0 to 32.0%
Minimum indication	Brix0.1%
Measuring accuracy	Brix±0.2%
Measuring temperature	5 to 40°C automatic temperature compensation
Ambient temperature	5 to 40°C
Sample volume	0.1 ml or more
Measuring time	2 seconds
Material	Main body: ABS resin
Power supply	006 dry battery (9V)
Dimensions-Weight	17(W)X9(D)X4(H)cm, 300g

12 Term of warranty and repair service

The Digital Refractometer PR-32 is a very precise and complex instrument that is composed of optical parts (prism, object lens) and electronic parts. Since it basically functions by interactions of the optical and electronic components, it is very difficult to detect the cause of a trouble if there is something wrong with the refractometer. Therefore, the Digital Refractometer requires special knowledge of not only optics and electricity but also the Digital Refractometer itself for adjusting and repairing it.

In those circumstances, only the servicemen of our company and authorized servicemen who took our technical training course in maintenance of the refractometer are permitted to perform such service work. General users are not permitted to disassemble, adjust the refractometer and to replace parts except some limited work such as simple inspection and replacement that are explained in this instruction manual.

If the refractometer is adjusted or repaired by an unauthorized person, ATAGO won't be responsible for assuring the performance and accuracy of the refractometer.

ATAGO warrants the refractometer for one year after purchase.

If the refractometer has something wrong in the term of the warranty, it will be repaired free of charge.

In such an event, consult with the dealer or our distributors about the trouble in detail. However, keep it in mind that the prism is out of the warranty and its replacement will be charged even in the term of the warranty.

Even in term of the warranty, if a person who has not taken our technical training course in maintenance of the refractometer has opened the unit and touched the inside, we make some charge for the repair.

After the term of the warranty, the refractometer will of course be repaired by us but there will be a charge for the repair or replacement. Consult with the dealer or our distributor about details.

- **Genuine service parts**

New genuine parts of the refractometer will be supplied for replacement for seven years after production of the refractometer is discontinued.

Genuine service parts that are very important to maintain the original performance of the refractometer will be supplied through the dealer or our distributor.

If this product is discontinued, we will try to ensure a secure supply of repair performance parts for the following seven years. Yet during that seven-year period, we may not be able to supply the part you may need due to reasons related to the manufacturing or model changes made on for that part. Please understand this in advance.

- **Recommendation of periodical inspections (to be charged)**

To make the refractometer demonstrate its original performance and accuracy for a long time, it is recommended to inspect and repair the refractometer periodically (once every two years).

Consult with the dealer or our distributor about periodical inspection and repair, (to be charged).

Details of periodical inspection are as follows.

- Check and adjustment of the refractometer in whole and functional parts, and parts replacement (if necessary).
- Check and adjustment of span.

ATAGO CO LTD.

When inquiring of a dealer or our distributor about repair or other matters let them know the serial number of your refractometer please.

Signature of manufacturer's Representative:

Place : ATAGO CO. . LTD. /Tokyo

Date : Dec. 13, 1999

Signature of manufacturer's Representative:



HIDEAKI KAWASUMI

ATAGO CO., LTD.

Dec .13 . 1999

MANUFACTURER'S DECLARATION OF CONFORMITY

Product Identification

Product : DIGITAL REFRACTOMETER
Brand : ATAGO
Model/Type : PR-32
Additional information : Power Source; Battery 006P(9V)
Manufacturer : ATAGO CO.,LTD.
 32-10 Honcho, Itabashi-ku, Tokyo 173-0001 Japan
Representative : HIDEAKI KAWASUMI
Function : Manager, Quality Control Dept

A sample of the product has been tested by : JAPAN QUALITY ASSURANCE ORGANIZATION
 21-15 Kinuta 1-chome, Setagaya-ku, Tokyo 157-0073

Standard used : EN 50082-1 1992'
 IEC 801-2 1991
 IEC 801-3 1984
 IEC 801-4 1988

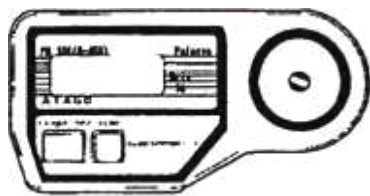
Test report no. : JQA Test Report 80-51139

We certify that the product is in conformity with the requirements of the EMC Directive 89/336/EEC.

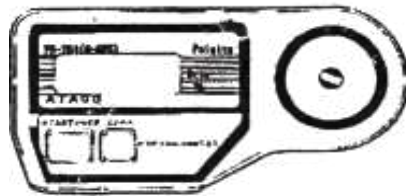
ADDITIONAL DECLARATION

The PR Series : PR-101, PR-201, PR-301, PR-32 are made with quite same design, parts .
 composition, mechanical construction, electronic circuit board and optical construction (figure 1).
 The different portions are only an angle of the prism and the setting position of the dip-switch of to change the
 scale unit on the software (figure 2), and there is no factor to change the level for 3 EMC.

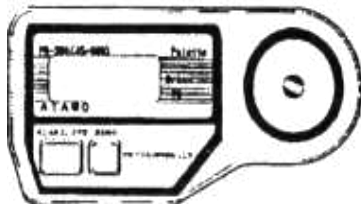
(figure 1)



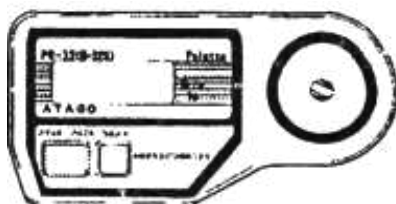
PR-101



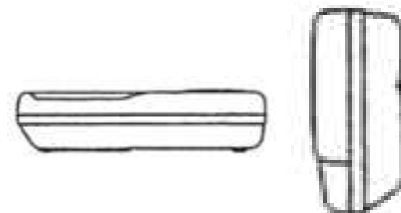
PR-201



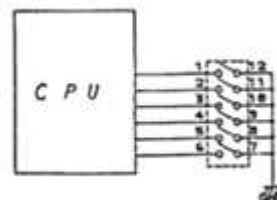
PR-301



PR-232



(figure 2)



ATAGO CO.,LTD.

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