

Digital Immersion Refractometer

PAN-1 Cat.No.3596
PAN-1(M) Cat.No.3597
PAN-1(L) Cat.No.3598



Do not dip the instrument in any sample that is over 100°C.

3596-E06

Introduction

Thank you for purchasing the Digital Immersion Refractometer, PAN-1. Before operating, read this instruction manual carefully to understand its contents. Keep the manual with the instrument for future reference.

Safety Precautions

To use the PAN-1 safely, the precautions described in this instruction manual must be observed. Failure to comply may result in injury and/or damage to property.

WARNING

Use caution as hot samples can cause severe burns. Do not dip the instrument directly into a boiling pot to measure; instead, place the liquid in a separate container and measure.

- When measuring hazardous materials, use proper safety procedures, materials, and clothing to avoid personal injury. Anyone handling hazardous materials should understand their properties and safety requirements.
- If the instrument is dropped or subjected to a strong impact, contact your supplier for inspection.
- Do not attempt to repair, modify, or disassemble the instrument.

CAUTION

- Do not dip the instrument in any sample that is over 100°C.
- If this instrument is used to measure highly acidic samples, the prism and prism head may be damaged, resulting in inaccurate measurements.
- The prism is made of optical glass. Metal tools and/or implements can damage the prism surface. If the surface of the prism is scratched or damaged, inaccurate measurements will occur.
- Before use, carefully read the instruction manual and fully understand the function and operation of the instrument.
- Use the battery specified for this refractometer. Insert the battery properly, paying attention to the polarities.
- Do not leave the instrument in a location exposed to direct sunlight or near a heat source for any extended period of time.
- Do not change the ambient temperature of the instrument suddenly.
- Do not place the instrument where it will be subject to strong vibrations.
- Do not use the instrument where there is an excessive amount of dust.
- Do not store the instrument in an extremely cool area.
- Do not set or drop heavy objects on the instrument.
- When transporting the PAN-1 on an airplane, remove the battery.

<Note regarding water resistance>

Only the prism head of the PAN-1 should be submerged into water.

ELI Function

<The PAN-1 is equipped with the External Light Interference (ELI) function to ensure accurate readings>

If the PAN-1 is subjected to intense light, such as direct sunlight or artificial lighting, when measuring a sample or zero setting, the ELI function will display the [nnnn] (Fig.A) warning message immediately after the START or ZERO key is pressed. When this happens, shade the prism head with your hand and press the START or ZERO key again. If the warning message continues to be displayed, expose the sample in a non-translucent cup to measure.

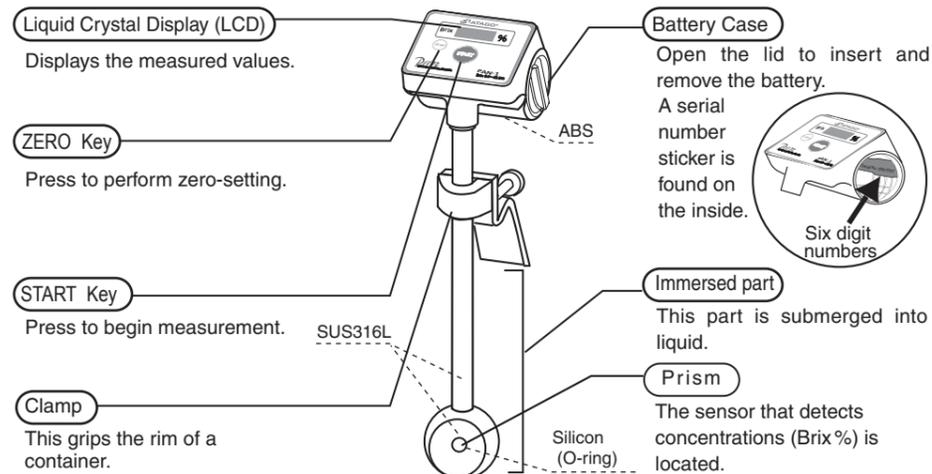


1. Contents

The PAN-1 comes with the following items:

- Digital Immersion Refractometer PAN-1 (with Clamp)1
- Size D Battery1
- Instruction Manual (this book)1

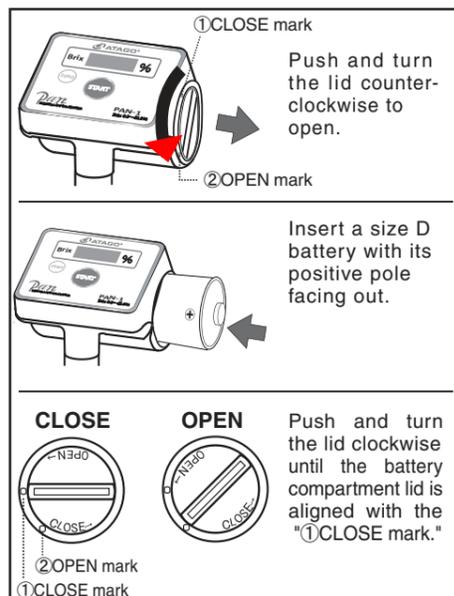
2. Parts



3. Battery Replacement

[CAUTION]

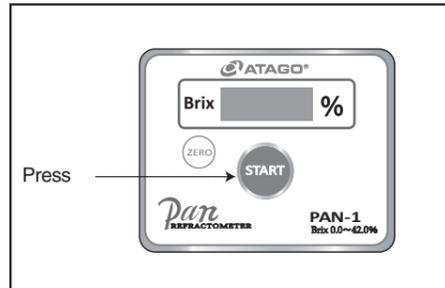
Open the battery compartment in a dry environment. Do not touch the battery with wet hands. Do not touch the contact springs as oil or any other impurities shorten the battery life. Clean the springs with alcohol if necessary.



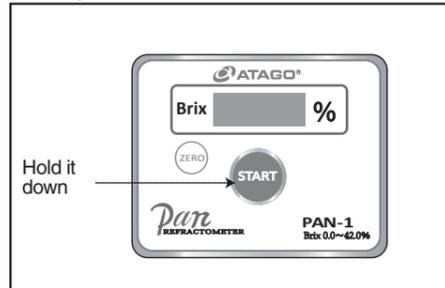
4. Turning On and Off

Turn on and off the power with the START key.

Turning on

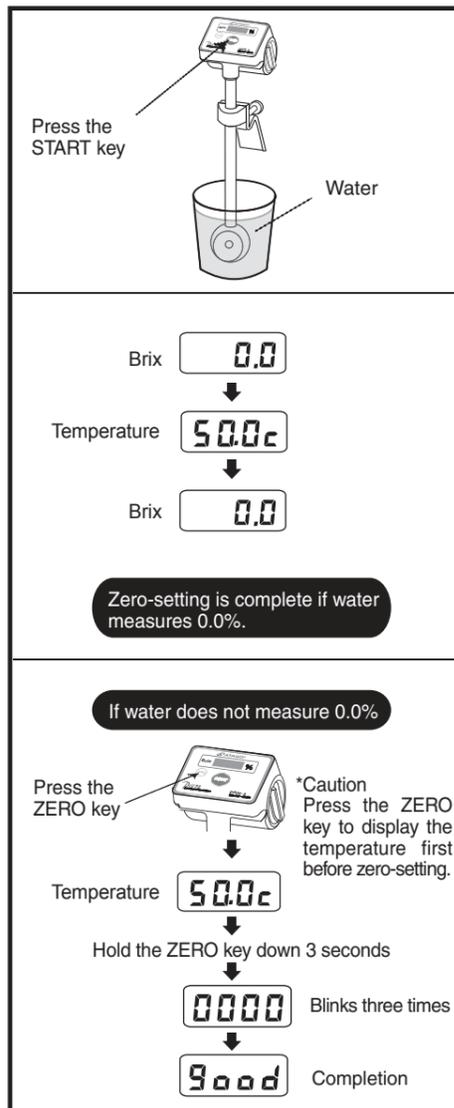


Turning off

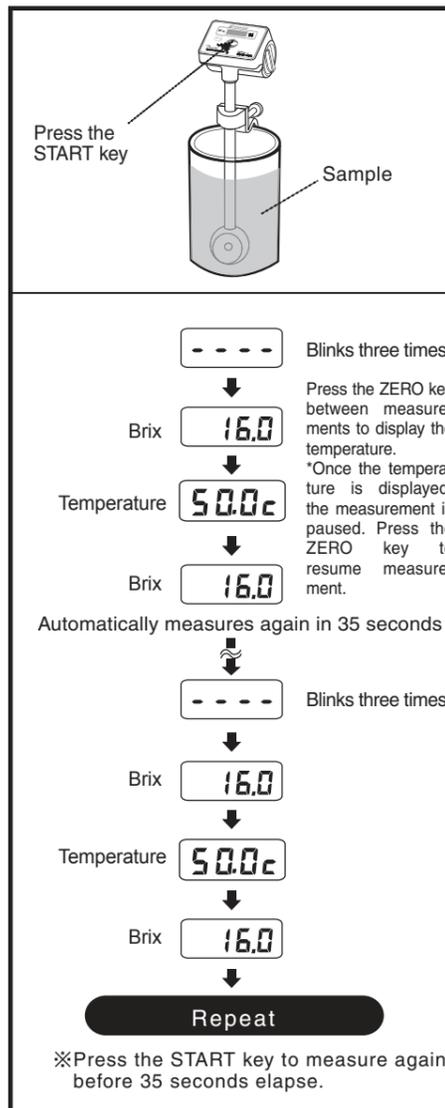


5. Zero Setting

Zero-set the unit twice a day.

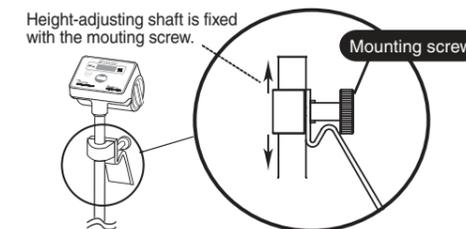


6. Measurements



7. Installation

Adjust the height of the display unit at the clamp and fasten the mounting screw to securely fix the shaft in position.



The clamp mount spins free when the mounting screw is loosened, allowing for shaft height adjustment at any desired angle. Position the display unit upright after the height adjustment is complete.

8. Error Messages

External Light Interference (ELI)

The following warning message will be displayed when intense light passes through the prism.



Shade the sample stage with your hand and press the START or ZERO key again.

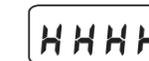
"LLLL" Measurement Error

There is an insufficient amount of sample on the prism surface to perform measurements.



"HHHH" Measurement Error

The measured value is out of the measurement range.



Zero Setting Error

There is no or insufficient amount of water on the prism surface to perform zero-setting.



Battery Error

The following error message will be displayed when the battery power is low. Replace with a new battery.



9. Storage and Maintenance

- Store this instrument in a dry and shaded area. A damp storage area may cause the optical system to malfunction or facilitate the growth of mold. Extended exposure to direct sunlight may cause the casing to warp.
- Do not use organic solvents (paint thinner, benzene, gasoline, etc.) on the instrument as they will severely damage the casing.
- After use, clean the prism with water and dry any excess moisture with a clean, dry tissue.

10. Brix Scale and Automatic Temperature Compensation

(1) Brix Scale

All Refractometers are designed to measure the Refractive Index of a solution. The Brix scale is based on a sucrose (sugar) and water solution. However, since most samples contain substances other than sugar - such as salts, minerals and proteins - the Brix percentage represents the total concentration of all soluble solids in the sample. For certain samples, such as cutting oils and other industrial fluids, a conversion chart from the Brix percentage to the sample's total concentration may be necessary.

(2) Automatic Temperature Compensation (ATC)

The ATC feature of the PAN-1 displays the measured value of the sample at the standard 20°C (within the measurement temperature range of 10 to 95°C). As the temperature of a solution changes, so does the Refractive Index. The ATC feature of the PAN-1 is performed by a temperature sensor which measures the change in prism temperature and then calculates the actual measured value in relation to the temperature change. Since the prism temperature is changing, allow time for the temperature of the prism and sample to equalize for the ATC to work properly.

11. Specifications

Measurement range	Brix 0.0 to 42.0% Temperature 10.0 to 99.9°C
Resolution	Brix 0.1%, Temperature 0.1°C
Measurement accuracy	Brix ±0.2%, Temperature ±0.5°C
Measurement temperature	10 to 95°C
Ambient temperature	10 to 45°C
Measuring time	3 seconds
Power supply	Size D alkaline battery × 1 Compatible with LSD NiMH.
International Protection class	Immersed part IP67 Display IP65
Dimensions and weight	PAN-1 80(W) × 300(L) × 72(H)mm, 630g PAN-1(M) 80(W) × 400(L) × 72(H)mm, 660g PAN-1(L) 80(W) × 600(L) × 72(H)mm, 730g

12. Repair and Warranty

The PAN-1 is warranted for one year after the date of purchase against any manufacturer defect in materials or workmanship. Since the PAN-1 is a precise optical instrument, great care must be taken in the instrument's storage and use. If any mistreatment or misuse of the instrument is detected, the warranty will be voided and repair fees will be charged. Ask your supplier for more details.

Have the serial number of your PAN-1 available when asking about repairs.

ATAGO's instruments are rigorously inspected to ensure each unit meets the highest standards of quality assurance.

13. CE Certification

The product is in conformity with the requirements of the EMC Directive 2004/108/EC.

