twilight

INSTRUMENTOS DE MEDICIÓN INDUSTRIAL

Refractómetro digital de inmersión PAN-1DC L

AT-PAN1DC(L)

Simple concentration monitoring system.
Never miss a concentration change
with real-time readings!

Pan REFRACTOMETER

Digital Immersion Refractometer PAN-1

Cat. No.3596

■Applications

- Metal-working fluids
- Water-based cleaning fluids
- Food

Automatic continuous measurement!

Once START is pressed, the unit continues to take measurements every 30 seconds.

Simply clip the unit on to the side of a container or pot!

No special equipment is needed for the set-up.

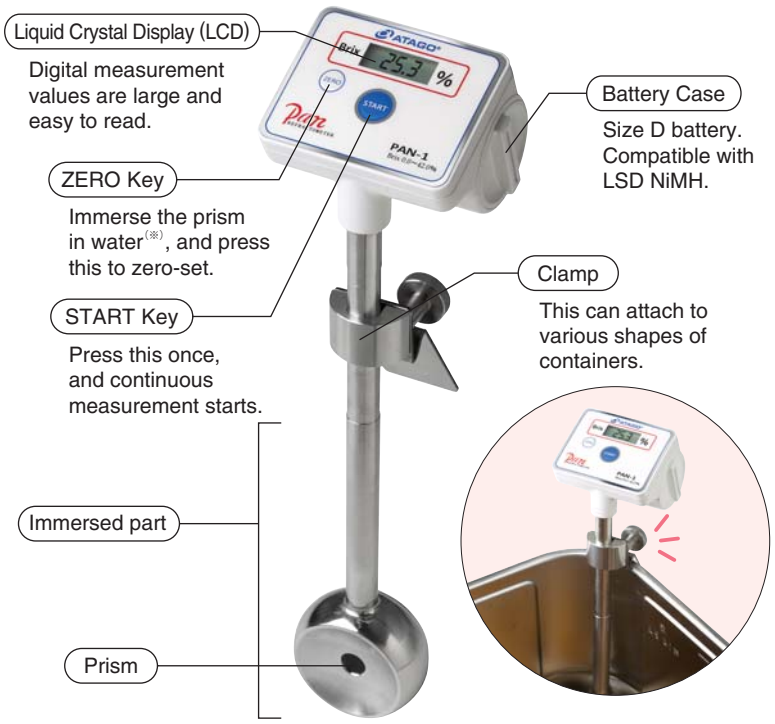
Rugged construction for reliable long-term performance!

The immersed part is made of SUS 316 stainless-steel.

ATAGO®

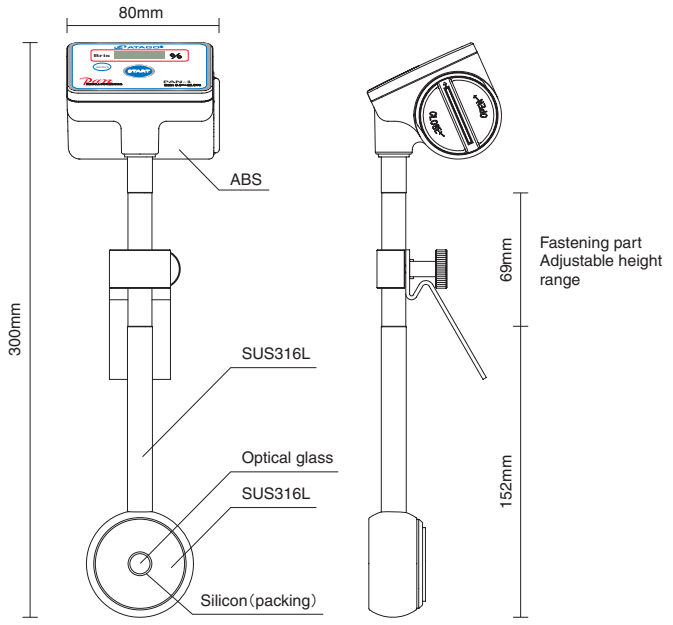
Digital Immersion Refractometer PAN-1 Cat. No.3596

■Names and Functions of Components



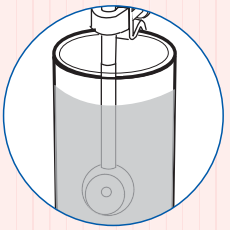
※Use water at a similar temperature to the liquid to be measured.

■Dimensions

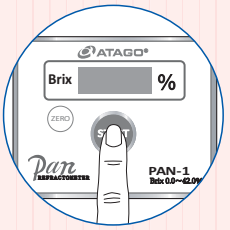


■Measurement Method

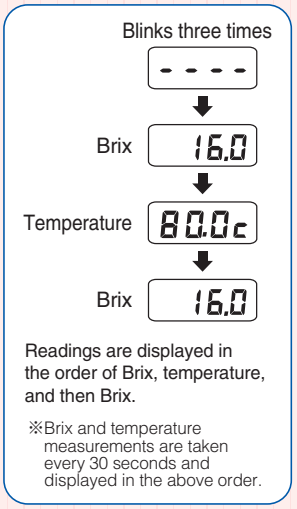
①Submerge the prism in the liquid.



②Press the START key.



③Measurements are taken every 30 seconds.



Readings are displayed in the order of Brix, temperature, and then Brix.

※Brix and temperature measurements are taken every 30 seconds and displayed in the above order.

■Displayed Value

This instrument measures the refractive index of a liquid and displays the converted value in "Brix," which is a percentage measurement of sugar in water. The concentration of a substance other than sugar can be calculated by creating a conversion table of the desired concentration % and corresponding Brix %. Contact ATAGO for further details.

■Specifications

PAN-1	Cat. No.3596
Measurement range	Brix 0.0 to 42.0% Temperature 10.0 to 99.9℃
Resolution	Brix 0.1% Temperature 0.1℃
Measurement accuracy	Brix ±0.2% Temperature ±0.5℃
Measurement temperature	10 to 95℃
International Protection class	Immersed part IP67 Display IP65
Dimensions and weight	80(W)×300(L)×72(H)mm 610g(main unit only)
Battery life	2 months (when an alkaline battery is used)
Power supply	Size D alkaline battery × 1 Compatible with LSD NiMH.
Ambient temperature	10 to 45℃
Accessories	①Size D battery ②Instruction manual

All ATAGO refractometers are designed and manufactured in Japan.

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

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ISO9001 REGISTERED H.Q. & Factory

※Specifications and appearance are subject to change without notice.

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Digital Immersion Refractometer
PAN-1DC(90)

Cat.No.3609(90)

3609(90)-E02

ATAGO®
Instruction Manual

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

Introduction

Thank you for purchasing the Digital Immersion Refractometer, PAN-1DC. 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 instrument 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.

◇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℃.
◇ATAGO is not liable for any loss and damage caused by the measurement and use of this instrument.
◇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.
◇Supply the instrument with DC24V only (allowable fluctuation is ±10 %).
◇Do not use power cables that are damaged or modified.
◇Do not insert or disconnect the power plug with wet hands.
◇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.

〈Note regarding water resistance〉

Only the prism head of the instrument should be submerged into water.

ELI Function

Fig.A

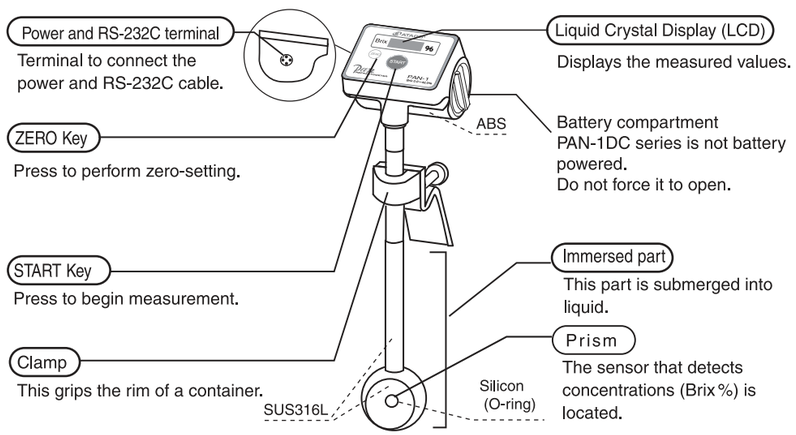
<The instrument is equipped with the External Light Interference (ELI) function to ensure accurate readings>

If the instrument 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 and press the START or ZERO key again. If the warning message continues to be displayed, place the sample in a non-translucent cup to measure.

1.Contents

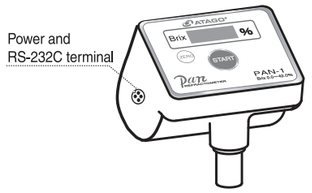
The instrument comes with the following items:
◆ Digital Immersion Refractometer PAN-1DC (with Clamp) ·····1
◆ Instruction Manual (this book) ·····1
◆ Power and RS-232C cable ·····1

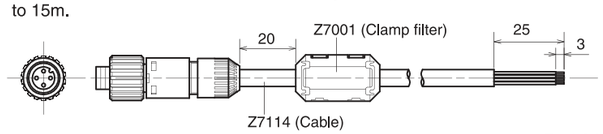
2.Parts

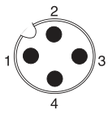


3. Power and RS-232C output

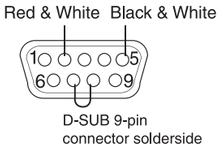
The power and RS-232C cable connects to the side of the instrument, and it provides power (DC24V) to the instrument and transmits Brix data via RS-232C. One multipurpose socket: serves for both power and RS-232C output (cable provided in standard delivery).
The length of a cable is 2m.
The cable can be ordered to a custom length of up to 15m.







Pin number	Cord color	Signal name
1	Red	DC24V
2	Black & White	RS-232C GND
3	Black	DC24V GND
4	Red & White	RS-232C



(1)Power

When the DC24V power is supplied, the instrument turns on.
The instrument has no power switch.

(2)RS-232C Output

①Preparing a PC for Data Transmission
Download a terminal emulator for PC serial communication.
Here, the open-source software "Tera Tarm " is used as an example.

Download Tera Term from a website, such as the one below:
http://ttssh2.sourceforge.jp/index.html.en/

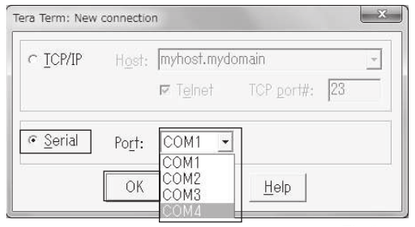


Fig.3-1

②Start Tera Term. (Fig.3-1)
Select "serial" on the New connection dialogbox.
Select the port number.
Click OK.
※Check the port number.
"Control Panel" →
"System and Security" →
"Device Manager" →
"Port"

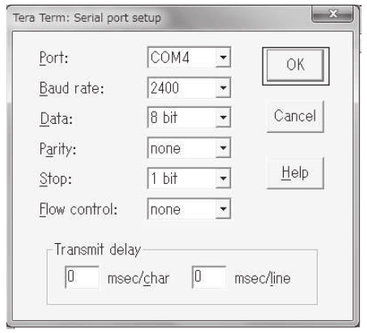


Fig.3-2

③Click Setup, and then Serial port.

④Enter the port number selected in step②.
(Fig.3-2)
Baud rate : 2400bps
Data length : 8bit
Parity : none
Stop bits : 1bit
Click OK.

⑤Click Setup, and then Terminal port.

⑥Enter the settings as shown below and Click OK. (Fig.3-3)

※Make sure that the "Local echo" is checked.

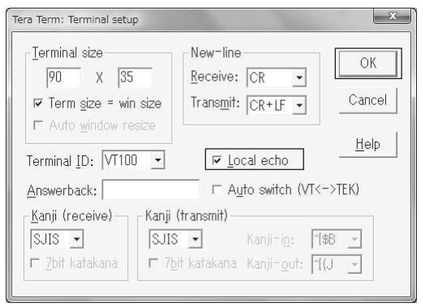


Fig.3-3

(3)Transmit

Every time a measurement is taken, a new row of data appears in the Tera Term window.

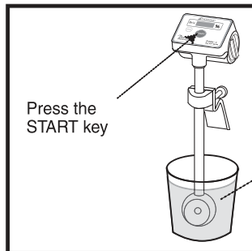
Transmitted data format.

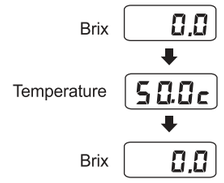
Measurement successful	:Temperature, Brix	26.2,0.0
"LLLL" error	:Temperature, LLLL	28.5,LLLL
"HHHH" error	:Temperature, HHHH	28.6,HHHH
External Light Interference (ELI) error	:Temperature, NNNN	28.9,NNNN
Zero-setting successful	:ZERO OK	ZERO OK
Zero-setting failed	:ZERO NG	ZERO NG

Example

4. Zero Setting

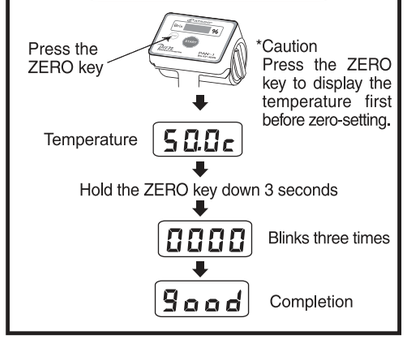
Zero-set the unit twice a day.



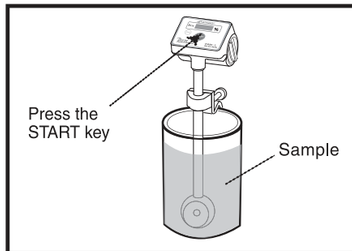


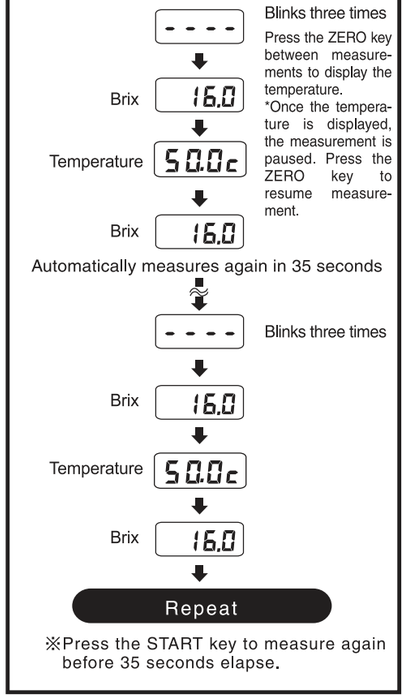
Zero-setting is complete if water measures 0.0%.

If water does not measure 0.0%



5. Measurements



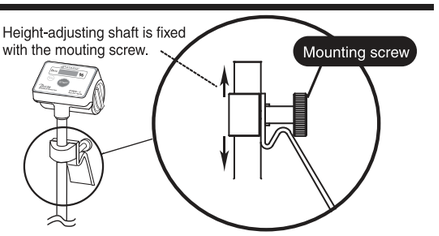


※Press the START key to measure again before 35 seconds elapse.

6. 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.



7.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.

8. Storage and Maintenance

(1)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.
(2)Do not use organic solvents (paint thinner, benzene, gasoline, etc.) on the instrument as they will severely damage the casing.
(3)After use, clean the prism with water and dry any excess moisture with a clean, dry tissue.

9. 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 instrument displays the measured value of the sample at the standard 20℃ (within the measurement temperature range of 10 to 95℃). As the temperature of a solution changes, so does the Refractive Index. The ATC feature of the instrument 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.

10. Specifications

Measurement range	Brix 0.0 to 42.0% (Automatic Temperature Compensation) Temperature 10.0 to 99.9℃
Resolution	Brix 0.1%, Temperature0.1℃
Measurement accuracy	Brix ±0.2%, Temperature±0.5℃
Measurement temperature	10 to 95℃
Ambient temperature	10 to 45℃
Power supply	DC 24V (Allowable fluctuation is ±10%)
Power consumption	0.6VA
International Protection class	Immersed part IP67
Dimensions and weight	80(W)×1000(L)×72(H)mm 910g (Main unit only)

11. Repair and Warranty

The instrument is warranted for one year after the date of purchase against any manufacturer defect in materials or workmanship. Since the instrument 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 instrument available when asking about repairs.

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

12. CE Certification

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

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