

## The warranty period extension method 1 year → 2 years

The warranty period will be extended from 1 year to 2 years when you register customer information. ATAGO Logger NFC can also be downloaded at the same time.

Trouble scanning the code? Access this link <https://www.atago.net/ur/index.php?l=en>



QR code

## Pocket Brix-Acidity Meter (Vinegar)

# PAL-BXIACID181

Cat. No. 7581

Master Kit

**ATAGO®**  
Instruction Manual

### Parts



**LCD**  
Displays the measured values, sensor temperature, and battery indicator.  
The instrument will turn itself off after 2 minutes of inactivity. To manually turn it off, hold down the START button for more than 2 seconds.

**Sample Stage**

Place sample on the sensor located at the center of the sample stage.

**START Button**

Press to take measurement. To turn off the display, press and hold for more than 2 seconds.

**R Button**

Press the button to show the sugar and acidity ratio.

**ZERO Button**

Press to perform zero-setting.

**Battery Compartment**

Place and remove batteries from here.

**Lanyard Hole**

Image is for explanation purposes only. It may be different than the actual product purchased.

### Contents

Main unit...1 Instruction Manual (this book)...1 AAA batteries...2 Measuring Spoon 1mL...1

Beaker 100mL...1 Digital scale...1 (About the Digital Scale)

**Note** Please remove the tape in the battery compartment before first use.

**Memo** The measuring spoon is available from ATAGO. Part No. RE-39005 Measuring Spoon 1mL

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

### Quick Tips

- The instrument measures the Brix in the sample solution, and the acidity in the 1: 50 dilution of the sample that is diluted with purified water.
- Press the START button once to measure the Brix. The Brix and the acidity of the sample (stock-solution) will be displayed at the end of the measurement.

Measurement of Brix



Measurement of Acid



- Press the ZERO button to perform zero-setting for either Brix or Acidity. Zero-setting can be performed with water (for Brix) or air (for acidity)

- LCD Auto Shut-off**  
The instrument will turn itself off after 2 minutes of inactivity. To manually turn it off, hold down the START button for more than 2 seconds.

### Measurement Value

**Brix**

Brix represents the weight of sucrose in 100 grams of sucrose solution as percentage by weight. When other dissolved solids are present in the solution, Brix conversion may be applied.

Brix is a measure of the total dissolved solids in a solution and indicates the combined concentration of all soluble substances, such as sugar, salt, protein, and acids.

**Acid**

This unit measures and determines the acidity through electrical conductivity.

Acetic acid is the primary acid found in Vinegar.

The instrument measures the total acidity in a sample and converts it into acetic acid concentrations.

### Automatic Temperature Compensation

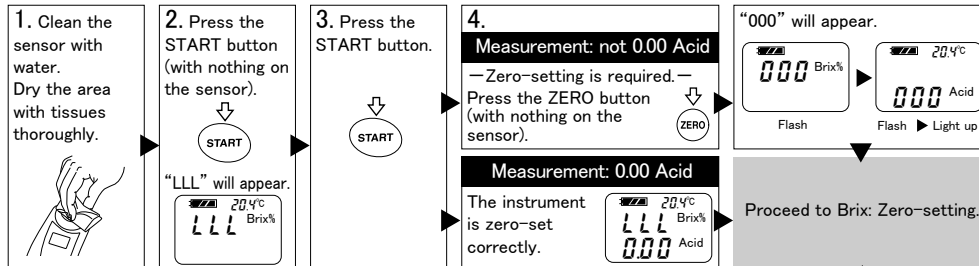
The Automatic Temperature Compensation (ATC) feature is based on temperature detected by the thermo sensor located near the sensor area.

ATC may not work correctly when the temperature of the sensor area is not the same as the actual temperature of the sample. When measuring a hot or cold sample, let it sit on the sensor for approximately 20 seconds and measure, or take multiple readings until measurements become stable.

### Zero-Setting And Measurement

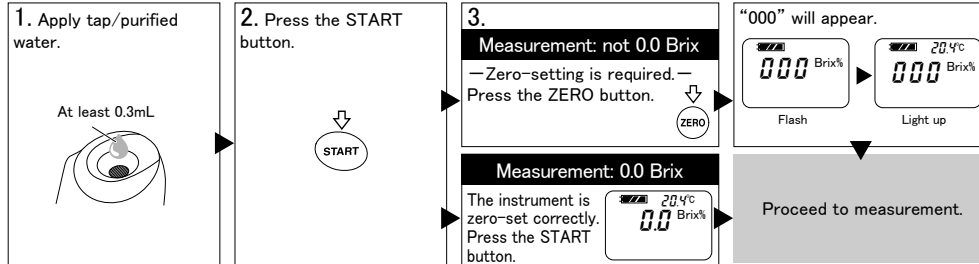
#### Preparation

Acid: Zero-setting



**Note** Recommended on a daily basis.

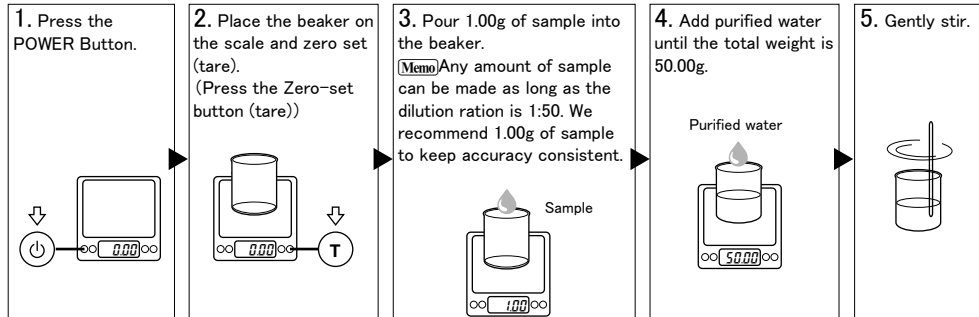
Brix: Zero-setting



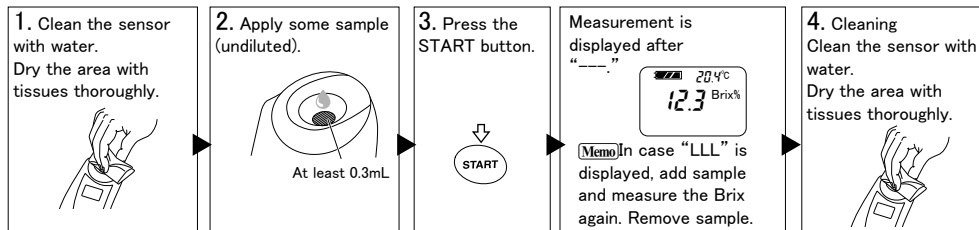
#### Measurement

[1] Acid: Dilution About the Digital Scale

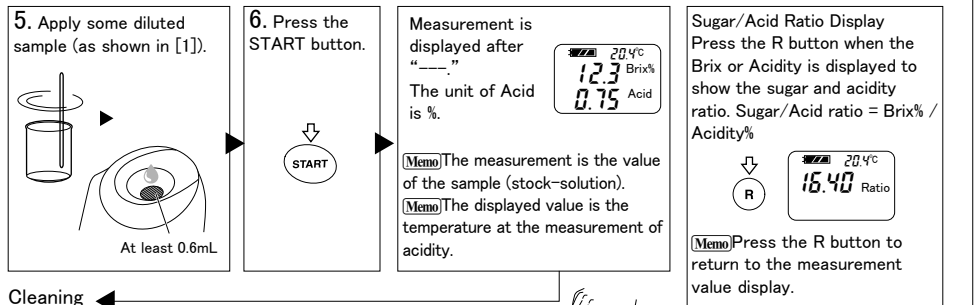
**Memo** Necessary Materials Digital scale, Beaker 100mL



[2] Measuring the Brix



[3] Measuring the Acidity



**Cleaning**

- Wipe off the sample. Clean the sensor with water. Dry the area with tissues thoroughly.
- Clean oily residues with mild soap, and then, rinse with water.

**Note** Handle the sensor with care so as not to scratch it.

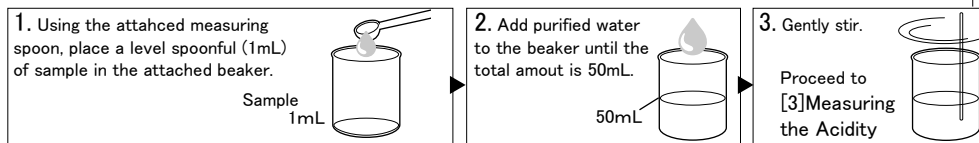
#### Addendum

Acid: Measuring Without using a Scale

For approximate measurement only

[1] Acid: Dilution

**Memo** Necessary Materials Measuring spoon 1mL, Beaker 100mL

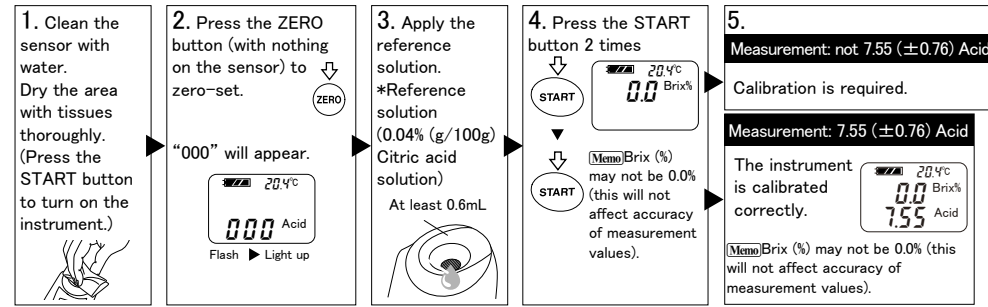


### Acid: Checking With Reference Solution

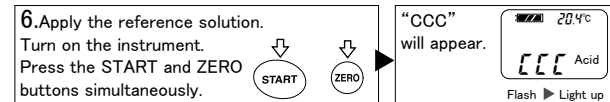
When there is any doubt regarding accuracy of measurement results, adjust the reference value according to the following procedure.

**Memo** The reference solution is available from ATAGO. Part No. RE-130004 Reference solution (0.04% Citric acid solution)

Acid: Checking with Reference Solution



Acid: Calibration



### Error Messages

The following messages alert the user when an operation has failed.

**RRR** Brix : The ZERO button was pressed with something other than water on the sensor section.

**AAA** Acid : The sensor was not empty when zero-setting was attempted.

**LLL** Calibration was attempted with something other than the calibration solution.

**HHH** Brix : The START button was pressed with nothing or an insufficient amount of sample on the sensor section.

**TTT** Temperature : The sensor temperature is below the temperature range.

**HHH** Brix/Acid : The sample measured outside the measurement range

**TTT** Temperature : The sensor temperature is above the temperature range.

**nnn** Brix : Too much light is entering the sensor, and the instrument cannot measure accurately. (Shade the sample stage with your hand and take a measurement again.)

**ooo** Sugar/Acidity Ratio : When the Sugar/Acidity Ratio is unable to be calculated.

**Lo** The battery is low.

### Acid: Offset Function

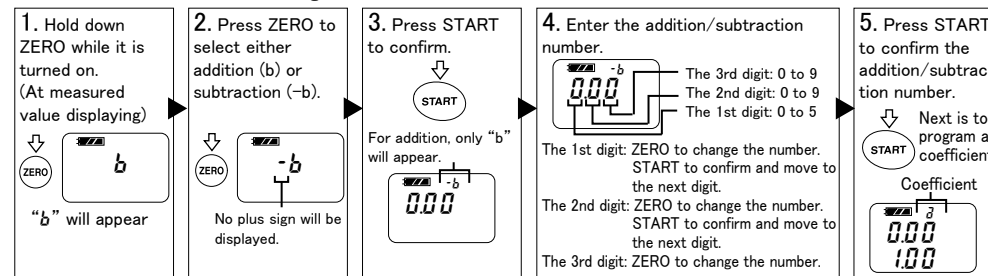
Discrepancies with titration

Due to the difference in measurement principles, readings from the instrument may not match up exactly with the readings by titration for certain samples. However, correlation between the two testing methods can be seen.

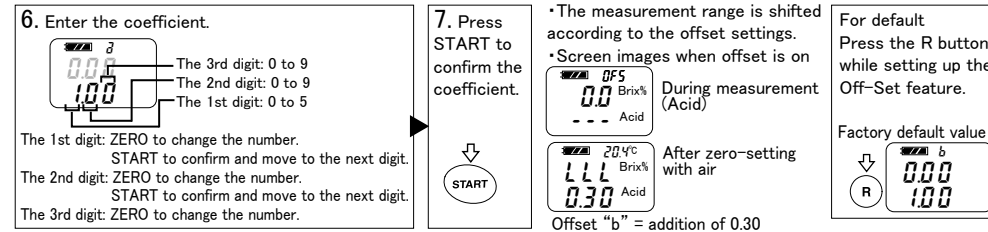
Offset feature use

Create a conversion chart between the two testing methods.

For addition/subtraction (b) [Range: -5.00 to 5.00]



For coefficient (a) [Range: 0.50 to 5.00]



### Specifications

Measurement range	Brix 0.0 to 90.0% , 10.0 to 99.9°C Acid 0.50 to 12.00%
Resolution	Brix 0.1% Acid 0.01% 0.1°C Sugar/Acidity Ratio 0.01 (0.00 to 99.99) 0.1 (100.0 or more)
Measurement accuracy	Brix ±0.2% Acid ±0.10% (0.10 to 1.00%) Relative precision ±10% (1.01% or more) ±1°C
Measurement time	Brix : Approx. 3 seconds Acid : Approx. 2 seconds
Backlight	The backlight stays on for 30 seconds after any button is pressed.
Output	NFC Forum Type 4 Tag ISO/IEC 14443 Type A
Output category	Date Time, Brix [%], Acidity [%], Sugar/Acidity Ratio, Temp [degC]
Acidity scale	(e.g.) 2019/01/17 09:30:45, 3.71, 1.02, 3.64 21.3
Automatic temperature compensation range	Brix : 10 to 100°C Acid : 10 to 40°C
Ambient temperature range	10 to 40°C
International Protection class	IP65
Power supply and Battery life	Two (2) AAA alkaline batteries
Dimensions and Weight	55(W) × 31(D) × 109(H)mm , 100g (main unit only)

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

Inserting Batteries

**Note**When the O-ring on the battery compartment cover is dirty or damaged, the water resistance may be compromised.

About the Digital Scale

**Note**Remove the tape from the battery compartment.

**Contents**

Main unit...1    Cover...2 (large and small)    AAA batteries...2

**Parts**

How to Use the Digital Scale

1. Press the POWER Button. "0" will appear.

2. Check the unit readout. Press the UNIT button and select "g."

3. Place the item you wish to weigh onto the scale. The item's weight will appear on the scale.

Zero-setting and Weighing

1. Press the POWER Button. "0" will appear.

2. Place the beaker on the scale. The beaker's weight will appear on the scale.

3. Press the Zero-set button (tare). "0" will appear.

4. Pour the sample you wish to weigh into the beaker. The sample's weight will appear on the scale.

Error Messages

Lo : The battery power is low. Replace with new alkaline AAA batteries.

O-LD : The item you are trying to weigh exceeds the permissible weight limit of the scale. Quickly remove it from the scale.

Environmental conditions

•Do not expose the scale to extreme heat or cold.

•Use between 10 to 30°C only.

•Any contact with or exposure to dust, debris, humidity, strong vibrations, extreme atmospheric conditions or other electronics may affect the accuracy of the scale and result in unreliable readings.

**Note**

•For precise measurements, place the item you wish to weigh onto the scale gently.

•Place the scale atop a flat, stable surface.

•The digital scale is remarkably durable. However, it is a precision instrument and should be used and treated with the utmost care.

•Use of the scale for purposes other than its intended use will result in damage to its internal components.

•Do not shake or drop the scale.

**Specifications**

Measurement range	0.01 to 500.00g
Resolution	0.01g
Unit	g, OZ, ozt, dwt, t, gn
LCD	LCD display with backlight
Auto-Off Feature	The scale will automatically turn off after 90 seconds of inactivity.
Power supply	Two (2) AAA alkaline batteries (Do not use rechargeable batteries.)
Temperature Conditions	Ambient temperature: 10 to 30°C

About Data Transmission Function

This instrument is equipped with NFC (Near Field Communication) technology. Data history can be accessed by bringing PAL-NFC to any Android devices, iPhone or PC-linked USB NFC Reader/Writer\* (in conformance to PC/SC specification).

\* Operation tested with SONY USB NFC Reader PaSoRi RC-S380.

Example of data history

Android devices / iPhone

Laptop or PC + USB NFC Reader/Writer

Example of data history read out

2017/08/17 09:30:45	LLL	0.00	ooo	20.5
2017/08/17 09:31:50	123	2.1	5.86	20.4
2017/08/17 09:32:12	123	1.3	9.46	20.4
2017/08/17 09:34:26	AAA	---	---	20.4
2017/08/17 09:43:07	---	AAA	---	20.4
2017/08/17 09:43:18	OOO	---	---	20.3
2017/08/17 09:45:39	26.9	1.9	13.68	20.3
2017/08/17 09:46:07	26.9	6.9	3.90	20.1

LLL : Lower limit error.  
HHH : Upper limit error.  
OOO : Zero setting complete.  
AAA : Zero setting error or Calibration error.  
CCC : Calibration Complete.  
nnn : External light error.  
ooo : Sugar / Acid Ratio Error.

Example of data history read out

Back side of the body  
Instrument's serial number  
Last 10 digits of NFC chip number (NFC'S serial number)  
You can use the NFC'S serial number to identify which instrument the readings correspond to.

You can check the NFC chip number (serial number) by using an app that can read the serial number.  
Note: Not all NFC apps capture the NFC'S serial number  
Suggested app: "NFC Tools"

(2) Date and time setting

Set the date and time (year [the last two digits of the western calendar], month, date, time and minute) prior to data history readout.

While powered on... (Example image)

(memo) Reset the date and time when batteries are removed for 24hours or more.

Press the ZERO button until the desired number is displayed.

Pressing the ZERO button will change the number.

Top right screen display during date and time set up

Year : 99 Month : 12 Day : 31

Hour : 24 Minute : 55

(Seconds : Fixed 00)

Data history readout

Android devices / iPhone

1. Launch NFC Reader (or other NFC tag reading app).

2. Position NFC on Android device or iPhone to the "R button" at the bottom portion of the PAL then bring in contact.

Laptop or PC + USB NFC Reader/Writer

1. Launch ATAGO Logger.

2. Bring the bottom part (where the "R button" is) of PAL in contact with the NFC mark on the IC card reader/writer.

\* Do not move it. (Hold for 1 second or more.)

\* NFC position on Android device or iPhone differs to the model.

\* Be sure to establish the PC and IC card reader/writer connection in advance by setting up (and installing the driver) IC card reader/writer.

\* Data history can be read out by holding up the USB NFC Reader/writer to the PAL unit.

All recorded data stored in this instrument are read out.

\* If data history is not read out, bring both in contact and move the one that is over the other device in a forward and back or left and right in a small motion.

**Caution** Bring PAL and Android devices, PAL and iPhone or PAL and USB NFC Reader/writer as close to each other as possible. (Position it so that the distance between both devices are 5mm or less.)

(memo) Data history can be read out while PAL is powered off.

(memo) Data history readout will not delete the stored data history.

Delete data history

All data history will be deleted from this instrument.

**Caution** Deleted data history can not be restored.

(memo) A data history can not be selected.

While powered on...

(Example image)

1. Quickly (3 seconds or less) do the following button operation.

(a) While pressing the START button, press the ZERO button two times.

(b) Quickly release the START button.

2. Press the START button. Delete data history

Press the ZERO button. End without deleting the data history.

Safety Precautions

Read and follow all safety instructions before operating the instrument.

**WARNING**

•When measuring hazardous materials, use proper safety procedures, materials, and clothing to avoid personal injury. Anyone handling hazardous materials should understand its properties and its 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**

•Before use, carefully read the instruction manual and fully understand the function and operation for each part of the instrument.

•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 sensor section and sample stage may be damaged, resulting in inaccurate measurements.

•Do not use any metal tools when applying sample to the sensor section. The metal can damage the sensor section. If the sensor section is scratched or damaged, inaccurate measurements will occur.

•When the unit needs to be washed, use water at a temperature not exceeding 50°C.

•Only use the specified battery type. Observe proper polarities, properly aligning the anodes and cathodes.

•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 are excessive amounts of dust.

•Do not store the instrument in an extremely cool area.

•Do not set or drop heavy objects on top of the instrument.

•Loosen the battery compartment cover for air transportation.

•The instrument is water-resistant, not waterproof, and should not be submerged.

Storage and Maintenance

Store the instrument in a dry place away from direct sunlight. Exposure to humidity may cause condensation inside, and exposure to direct sunlight may cause the plastic to warp.

Cleaning Clean and dry the sensor area thoroughly after use, leaving no sample residues or water. (For oily samples:) Remove oily residues with mild soap, and then, rinse with water.

Storage Store the instrument away from direct sunlight at a stable temperature with as little fluctuation as possible.

Repair and Warranty

The instrument is warranted for one year from the date of purchase. This warranty is void if the instrument shows evidence of the following. Send the included batteries as well if they are still in use.

•Having been disassembled by unauthorized personnel

•Damages to the sensor section and/or sample stage

•Water damage or having been dropped

•Leakage from batteries other than those included with the unit

•Having been misused and/or operated outside the environmental specifications

Repair services are available for a fee after the warranty expires.

Contact an ATAGO authorized service center for service and support.

Please have the serial number information ready when contacting a service center.

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