

# Digital Hand-held "Pocket" Salt Meter

4250-E10

**ATAGO**

## PAL-SALT Instruction Manual

Cat.No.4250



Read and follow all safety instructions before operating the instrument.

In just-a-minute

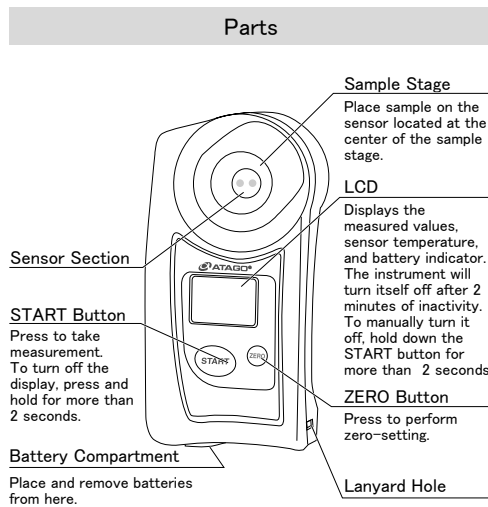
From 1 year to **2** years  
Free Extended Warranty

- It requires **only 1 minute!** Simply by answering quick questions, warranty period is extended from 1 year to 2 years.
- ATAGO Logger NFC can also be downloaded at the same time.

Access now



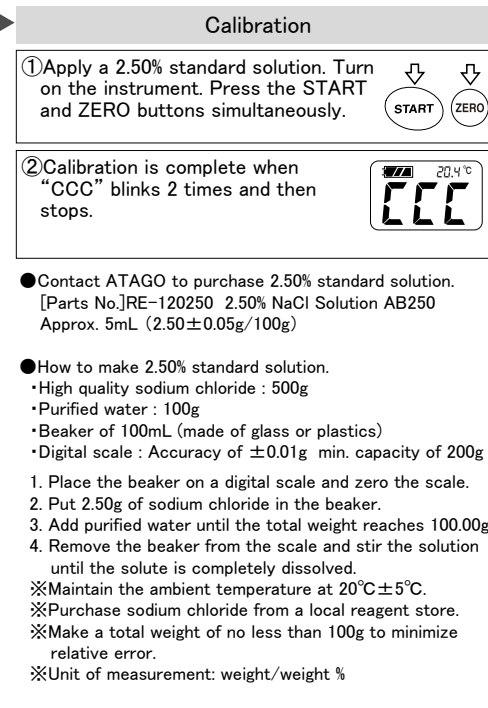
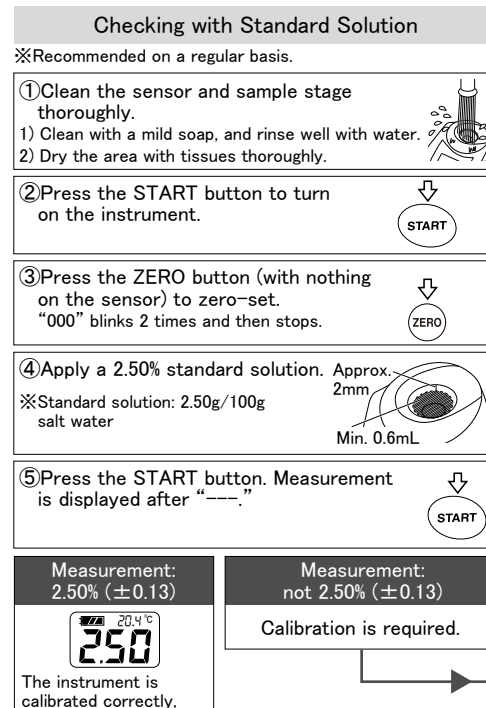
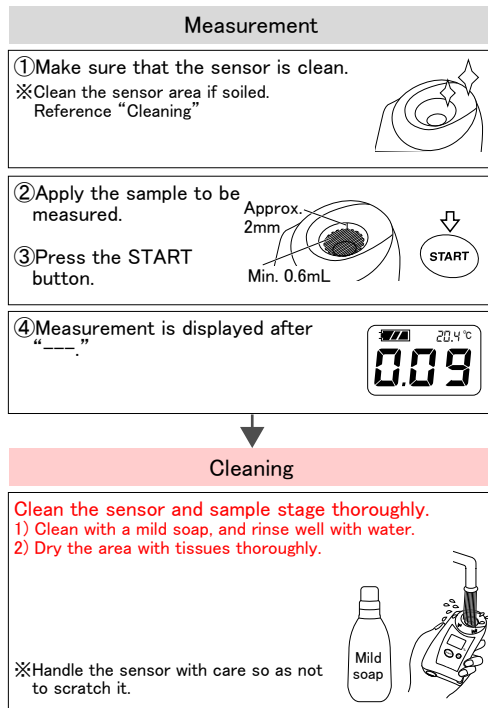
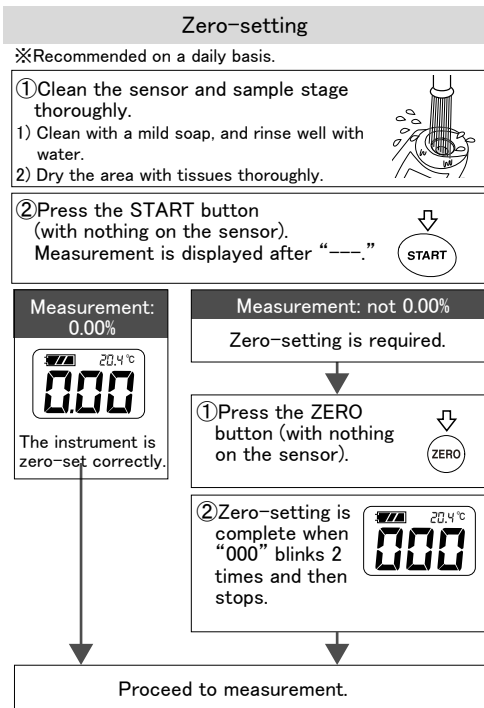
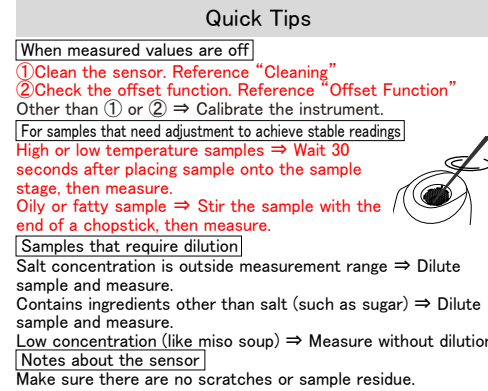
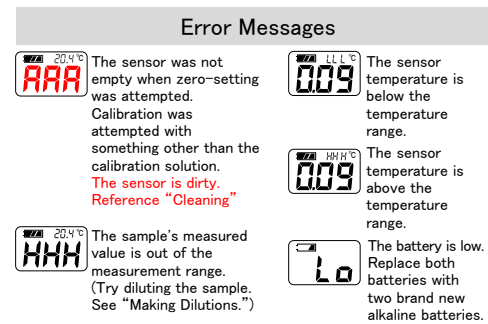
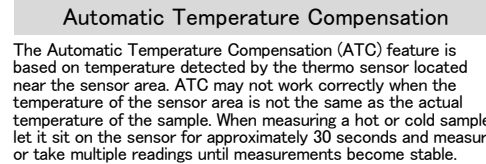
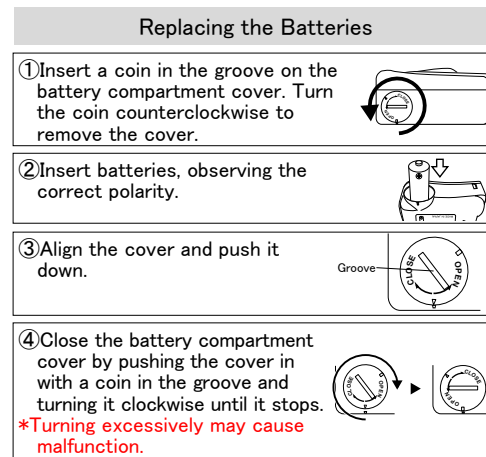
(The registration page can be accessed from ATAGO website.)



**Contents**

- Main unit .....1
- Instruction Manual (this book) .....1
- Calibration Report .....1
- AAA batteries .....2

※AAA alkaline batteries are included. Remove the tape from the battery compartment before inserting the batteries.



## Sample Preparation

Drinkable as is (less than 6% Brix)  
⇒No dilution is necessary

Liquid condiments (over 6% Brix, over 10% salt, and high in non-salt components)  
Soy sauce, Worcester sauce, etc.  
⇒Please dilute.

☞ See "Making Dilutions"

Paste  
Mayonnaise, miso paste, ketchup, etc.  
⇒Please dilute.

☞ See "Making Dilutions"

Solid food  
Pickles, ham, cheese, chips, etc.  
⇒Please mince/grind and dilute.  
☞ See "Making Dilutions"  
※Wait for approx. 5 minutes for the solids to settle to the bottom and measure the clear liquid on top.

## Measurement Examples

Tomato puree 1.7%  
Ketchup 3.0%  
BBQ sauce 4.8%  
Oyster sauce 9.4%  
Salmon 2.4%  
Salted cod roe 5.2%  
Potage 1.2%  
Miso soup 0.9%  
Soy sauce 13.0%  
Mayonnaise 1.6%  
Pickled radish 3.6%  
Pickles 1.7%  
Ham 1.1%  
Sausage 0.8%  
Noodle soup 1.4%  
Curry 1.6%  
Gouda 0.9%  
Butter 0.1%  
Crackers 2.3%  
Chips 1.4%

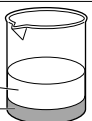
(Test data by ATAGO)

## Making Dilutions

Soy sauce, Worcester sauce, etc.  
(approx. 30–40% Brix)

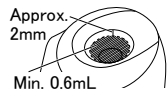
① Dissolve 10g of sample in 90.0g of water. Stir until the sample is dissolved completely.

Water 90g  
Sample 10g



② Measure the dilution.

Approx. 2mm  
Min. 0.6mL



③ Multiply the reading by 10 (dilution factor).

Example: A 10% dilution measures 0.90%

× 10 (dilution factor) = 9.0%

The actual salt concentration is 9.0%.

Offset feature use #1

Input a coefficient (a) of 10, and the value multiplied by 10 will be displayed.

Displayed value  
 20.4°C

## Measurement Principles

This instrument uses the electric conductivity method to measure and display salt concentrations % (g/100g). When complex samples containing ingredients other than salt are measured, the conductivity readings may be different from readings by other methods. Always dilute a complex sample to 10% by weight when its Brix exceeds 6%.

Brix is a measurement of the total dissolved solids (TDS) in a solution and measured by a refractometer. Check the Brix of you sample with a refractometer. For optimum results, it is recommended to dilute complex samples that are 6% Brix or higher.

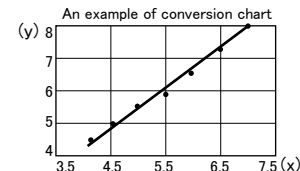
## Discrepancies with Mohr Method

Due to the difference in measurement principles, readings from the conductivity salt meters 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 #2

Create a conversion chart between the two testing methods.

$y = a x + b$   
y: titration readings  
x: PAL-SALT readings  
a: coefficient (multiplication)  
b: addition/subtraction number



## Offset Function

① Hold down ZERO for approx. 5 seconds while it is turned on. "b" will appear.

For addition/subtraction (b) [Range: -10.00 to +10.00]

② Press ZERO to select either addition (b) or subtraction (-b)

③ Press START to confirm.

④ Enter the addition/subtraction number. ZERO to change the number:

0, 1, 2, ..., 9, 9, 9, 0, 1, 2, ...

START to confirm and move to the next decimal place. When the 1<sup>st</sup> place is confirmed with "R," the number selections for the decimal places are skipped.

⑤ Press START to confirm the addition/subtraction number. Next is to program a coefficient.

For coefficient (a) [Range: 0.01 to 10.00]

⑥ Enter the coefficient.

ZERO to change the number:

0, 1, 2, ..., 9, 9, 9, 0, 1, 2, ...

START to confirm and move to the next decimal place. When the 1<sup>st</sup> place is confirmed with "R," the number selections for the decimal places are skipped.

⑦ Press START to confirm the coefficient.

※To disable the Offset feature. → Hold the ZERO button for 5 seconds while setting up the Off-Set feature. Factory default value (a:1.00, b:0.00).

※The measurement range is shifted according to the offset settings.

※Screen images when offset is on

During measurement 0.5 Water after zero-setting 20.4°C <example> Offset "b" = addition of 0.30

## 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.
- 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.
- Have the batteries and battery compartment cover removed during air transport.
- 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 the sensor and sample stage thoroughly.  
1) Clean with a mild soap, and rinse well with water.  
2) Dry the area with tissues thoroughly.
- 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
  - Having been misused and/or operated outside the environmental specifications
  - Leakage from batteries other than those included with the unit
- Repair services are available for a fee after the warranty expires. Contact an ATAGO authorized service center for service and support.

## Specifications

Measurement range	0.00 to 10.0% (g/100g) of salt concentration 5.0 to 100°C
Resolution	0.01% for salt concentration of 0.00 to 2.99% 0.1% for salt concentration of 3.0 to 10.0% ,0.1°C
Measurement accuracy	Displayed value ±0.05% (for salt concentration of 0.00 to 0.99%) Relative precision ±5% (for salt concentration of 1.00 to 10.0%) ,±1°C
Sample temperature	5 to 100°C
Ambient temperature range	10 to 40°C
Sample volume	At least 0.6mL
Measurement time	Approx. 3 seconds
Backlight	The backlight stays on for 30 seconds after any button is pressed.
Maximum number of data history	100
Output	NFC Forum Type 4 Tag ISO/IEC 14443 Type A Output category :Date ,Salt [g/100g],Temp [degC] (e.g.) 2021/03/17 09:30:45, 2.53, 20.4
Power supply	Two (2) AAA alkaline batteries
International Protection class	IP65
Dimensions and weight	55(W) × 31(D) × 109(H)mm, 100g (main unit only)

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

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