

# ES-421

## SALT-METER

**Easy and simple measurement  
of salt % by conductivity method!**

Up-to-the-minute funnel-shaped sensor section.

Compact body for two-way measurements being held by hand and placed on desk.



- At factories of food processing, sauce and dressing manufacturing, pickles manufacturing, etc.
- At fast food shops, restaurants, etc.
- At laboratories of cooperatives and consumers center, etc.
- At public health centers for nutrition guidance.
- At supermarkets for stocking foods and demonstration.
- As teaching materials at junior and senior high schools, universities.



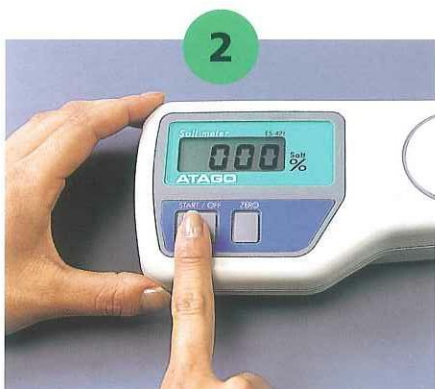


# Easy and simple operation!

- Little sample is enough for measurement!
- Simple calibration with air!
- Cleaning by just wipe-over!



1  
Apply drops of sample into the sensor section until it fills above the indication line.



2  
Press the START/OFF switch.



3  
After arrow flashes three times, the display indicates the salinity of the measured sample in percentage.

\*For measurement of a sample containing ingredients other than salt, dilute the sample so that its Brix index (percentage of soluble solid content) is less than 6%. For example, dilute soy sauce, Worcester sauce with distilled water 10 times (in weight) as thin as the original for measurement, and the actual salt % is obtained by multiplying the measured value by 10.

## Principle of Measurement

The detection principle of the ES-421 is the conductivity method, which detects electrolyte and converts to NaCl concentration. Compare to the "Mohr's method", the conductivity method have advantages than the Mohr's method. [1] No special tools (Chemical solution, pipettes, etc..) are needed. [2] No personal interpretation (Automatic measurement) [3] Faster measurement.

\*The Mohr's method detects Chlorine and converts to NaCl concentration. The unit that is used for Mohr's method is (g/100ml) while ES-421 uses (g/100g).

Samples are vary and there are many different ingredients in the sample. Even in the same sample, measurement value can be different due to the difference of the principle. However, there are correlation between the Mohr's method and conductivity method, so the conversion chart can be obtained by taking the measurement from both methods.

## Features

- Compact body is convenient for measurement in either way of being held by hand and placed on desk.
- Simple measurement just by pouring a small amount of sample into the funnel-shaped sensor section and pressing the START/OFF switch. Then, the salt % of the sample is displayed in percentage.
- Easy calibration just by zero setting with the sensor being exposed to air. Span adjustment with the reference solution is not required in general.
- By use of a refractometer (sugar content meter) together with, quantity of soluble solid content other than salt and calory of sample (except solution containing fats and oils and liquors) can be obtained roughly.
- After measurement, it needs simple cleaning just like wipe-over with tissues moistened with water. Moreover, the ES-421 needs not special care nor trouble for storing and handling it differently from other salt-meters employing glass electrodes.

## Specifications

- **Measurement method:** Conductivity method
- **Measurement range:** 0.00 to 10.0% (g/100g) of salt concentration
- **Measurement accuracy:**  
Displayed value  $\pm 0.05\%$  (for salt concentration of 0.00 to 1.00%)  
Relative precision  $\pm$  less than 5% (for salt concentration of 1.00 to 10.0%)  
Example 1: Solution of salt (3% of salt content)  
 $\pm(3.0 \times 0.05) = 0.15$  (measurement precision  $\pm 0.15\%$ )  
Example 2: Solution of salt (10% of salt content)  
 $\pm(10.0 \times 0.05) = 0.5$  (measurement precision  $\pm 0.5\%$ )
- **Minimum indication:**  
0.01% for salt concentration of 0.00 to 2.99%  
0.1% for salt concentration of 3.0 to 10.0%
- **Measurement temperature:** 10 to 40°C Automatic Temperature Compensation
- **Ambient temperature:** 10 to 40°C
- **Materials:** ABS resin (main body)  
Vinyl chloride resin (sample stage)
- **Power supply:** One 006P battery (9V)
- **Dimensions & Weight:** 17(W)×9(D)×4(H)cm, 300g (main unit only)

## EXPLANATION OF ICONS Icons for functions, specifications and scales have been added to this catalog.



- \* Compact and easy to carry
- \* Portable
- \* Leicht und einfach zu tragen
- \* Calibrazione con liquidi standard esclusivi
- \* Compacto y fácil de llevar
- \* 輕巧易於攜帶



- \* Battery operated
- \* Alimentation par pile
- \* Batteriebetrieb
- \* Alimentazione a batteria
- \* Funcionamiento con batería
- \* 使用電池操作



- \* Digital display
- \* Affichage numérique
- \* Digital Anzeige
- \* Display digitale
- \* Pantalla digital
- \* 數字顯示



- \* Automatic Temperature Compensation
- \* Compensation automatique de température
- \* Automatische Temperaturkompensation
- \* Compensazione automatica della temperatura
- \* Compensación de automática de temperatura
- \* 自動溫度補償



- \* Salt concentration scale
- \* Teneur en sel
- \* Skala fuer Salzkonzentration
- \* Salinità%
- \* Escala de concentración salina
- \* 鹽分濃度刻度

All ATAGO salt-meters are designed and manufactured in Japan.

CE HACCP G.M.P. G.L.P. ATAGO products are acknowledged by HACCP, G.M.P. and G.L.P. systems.

## ATAGO CO., LTD.

Headquarters: 32-10, Honcho, Itabashi-ku, Tokyo 173-0001 Japan  
TEL: 81-3-3964-6156 FAX: 81-3-3964-6137  
overseas@atago.net http://www.atago.net/

## ATAGO U.S.A., Inc.

12011 NE First Street, Bldg. C, Suite 110 Bellevue, WA 98005 U.S.A.  
TEL: 1-425-637-2107 FAX: 1-425-637-2110  
customerservice@atago-usa.com http://www.atago.net/

## ATAGO INDIA Instruments Pvt. Ltd. (Sales Office)

A-501, Mangal Aarambh Business Centre, Near Kora Kendra, Off. & S.V. Road, Borivali (West), Mumbai-400 092 India  
TEL: 91-22-2833-8038 / 8076 FAX: 91-22-2899-8164 customerservice@atago-india.com



\* Specifications and appearance are subject to change without notice.