

ES-421 - Digital Salt Meter, cat. no. 4210

Easy to read

Large display

Measurement results digitally displayed.

High Accuracy

Cup shaped sample stage

Only requires 1mL of sample. High accuracy of $\pm 0.05\%$ for salt concentration under 0.99%.

Lightweight and ergonomic design

Stable on the table yet compact to carry

Sample stage is made of ABS resin which is known for durability against corrosion. A sample can be measured while the device is in your hand or set on a desk.



Measurement Method



Fill above the line on the sample stage with sample liquid.



Press the START/OFF button.



Salt concentration (%) will display after arrow flashes 3 times.

Specifications

Scale	Salt concentration (g/100g)
Measurement Method	Conductivity method
Measurement Range	0.00 to 10.0%
Resolution	0.01% for salt concentration of 0.00 to 2.99% 0.1% for salt concentration of 3.0 to 10.0%
Measurement Accuracy	Displayed value $\pm 0.05\%$ (for salt concentration of 0.00 to 0.99%) Relative precision \pm less than 5% (for salt concentration of 1.00 to 10.0%)
Ambient Temperature	10 to 40°C (Automatic Temperature Compensation)
Power Supply	006P Dry battery (9V)
Offset feature	Yes
Dimensions & Weight	17x9x4cm, 220g (Main Unit only)

Measurement Techniques

Thin, drinkable liquids - Thinner or lower concentration liquids, such as soup or miso soup can be measured by placing a few drops of the sample directly on the sensor.



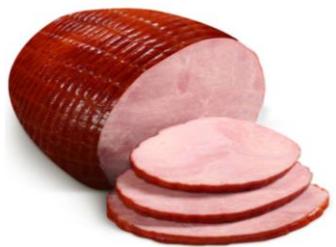
Thick, syrupy or paste-like liquids - Sauces, soup bases, seasonings, gravies need to be diluted to 10% for accurate measurement results. Anything that is highly concentrated (anything that measures above 6% Brix with a refractometer), must be diluted. The PAL-SALT and ES-421 measure the conductivity of electrolytes through electrical currents (conductivity). The thicker a solution is, the more closely the molecules are packed, and therefore, the less conductive. This makes the sample more difficult to measure. If not diluted, the measurement values may appear lower than the actual salt content.



Products with a salt content that exceeds the measurement of the range (above 10% salt) - Products that contain more than 10% salt, such as pickle brine, need to be diluted. For example the 10 times dilution of 12% salt brine will measure 1.2%, and the 5 times dilution will measure 6%. Adjust the dilution factor so that the salinity falls within measurement range.



Solid food - Solid food (ham, bacon, fried foods, fish and potato chips) need to be minced, ground or crushed and diluted with water (1:10) dilution). Let sit for approximately 30 minutes to allow the salt to leach out of the food. Measure the salinity of the water and multiply the reading by 10. The higher in salt the food is, the longer it will take for the salt to be drawn out onto water. Set a soaking period that works for each product. The PAL-SALT PROBE also has a probe sensor that can be inserted directly into the solid samples.



Oily/fatty food - Foods containing oil or fats can also be measured. However, the measurement values of foods that have oil floating on their surface, may be unstable. If the readings fluctuate when measuring oily/fatty foods, try stirring the sample, and measure again for more stable readings. When measuring salinity of oil-packed products, extract the sample from the oil and allow excess oil to drain. Mix 10 grams of sample with 90 grams of water to create 10% dilution. Mix or shake very well and let settle. Residual oil should float on top of the container. Take a sample from below the oil layer and place on the sensor. Multiply the displayed reading by 10 to obtain the salt concentration of the original sample.



Q&A

Q1 What can this instrument measure? - Various types of food that contain salt – soups, sauces, condiments, dressings, fish, ham, bacon, deli meats, brine, cheese, butter, dairy, crackers, crisps and more.

Q2 How do I measure my sample? – See 'Measurement Techniques' above.

Q3 Can I use tap water for dilutions? - Distilled water is the best, but tap water may also be used. Tap water may affect the readings slightly (approx. 0.01%). Do not use mineral water as it may affect the readings.

Q4 How do I clean it? - The unit is waterproof, so the entire body can be washed under running water. Use a mild cleanser to remove persistent residue, such as oil. Clean greasy residue with ethyl alcohol and rinse with water.

Q5 The readings are unstable - For samples containing oil or fats, try stirring the sample after placing on the sensor, and measure. This will help stabilise.

Q6 What is the key to measuring cold or hot sample? - We recommend leaving the sample on the sensor for 30 seconds before measuring. This will allow the sample to acclimate. Alternatively, take multiple readings until the readings stabilise.

Q7 How often does it need to be calibrated? - Zero-set the instrument at the beginning of each day before taking measurements. Clean the sample stage thoroughly and press ZERO with nothing on it.

Q8 Measurement values are irregular - Apply water or ethyl alcohol on the sample stage and wipe it off with lint-free tissue. Repeat the process a few times if using water. If this does not resolve the issue reference set with 2.5% standard Sodium Chloride solution.

Q9 How should I store the unit? - If the unit will not be used for an indeterminate amount of time, place the unit in the storage case that it came with.

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