

# Digital Refractometer

for Natural or Artificial Seawater Analysis

- Designed for seawater salinity analysis
- High accuracy measurements displayed as PSU, ppt and specific gravity
- Dual-level LCD
  - The dual-level LCD displays measurement and temperature readings simultaneously
- ATC
  - Automatic Temperature Compensation
- Easy measurement
  - Place a few drops of the sample in the well and press the READ key
- BEPS
  - Alerts the user of low battery power that could adversely affect readings
- IP65 water protection
  - Built to perform under the harsh field conditions associated with environments containing seawater.
- Quick, accurate results
  - Readings are displayed in approximately 1.5 seconds
- Single-point calibration
  - Calibrate with distilled or deionized water
- Small sample size
  - Sample size can be as small as 2 metric drops
- Automatic shut-off
  - After three minutes of non-use
- Stainless steel sample well
  - Easy to clean and corrosion-resistant
- ABS thermoplastic casing



## Ideal for Seawater Analysis

Hanna's HI96822 Digital Refractometer is a rugged, portable, water resistant device that utilizes the measurement of the refractive index to determine the salinity of natural and artificial seawater, ocean water or brackish intermediates. The HI96822 reflects Hanna's years of experience as a manufacturer of analytical instruments. This digital refractometer eliminates the uncertainty associated with mechanical refractometers and is durable and compact enough to be used at home, in the lab, or out in the field.

The HI96822 is an optical device that is quick and easy to use. After a simple user calibration with distilled or deionized water, a seawater sample can be introduced into the sample well.

Within seconds, the refractive index and temperature are measured and converted into one of three popular measurement units: Practical Salinity Units (PSU), parts per thousand (ppt), or specific gravity (S.G. (20/20)). All conversion algorithms are based upon respected scientific publications using the physical properties of seawater.

## The Importance of Salinity Measurement Throughout a Variety of Applications

Salinity is a critical measurement in many applications, such as aquaculture, environmental monitoring, aquariums, desalination plants, well water, and many more. Until now, the available technology to measure salinity has relied on mechanical instruments, such as hydrometers and mechanical refractometers, or on high-tech conductivity meters. While easy to use, getting a reading on a mechanical refractometer can be difficult since they are highly susceptible to changes in temperature. Hydrometers, though inexpensive, are typically made of glass and subject to breakage.

The Hanna HI96822 is the solution to all these issues. It is lightweight, easy to use, cost-efficient, and extremely accurate. With the ability to read in three of the most widely used salinity units (PSU, ppt, and Specific Gravity), it is the ideal instrument for any application.

## Easy to Operate

### Start-up Screens

When the HI96822 is turned on, all of the LCD segments will be displayed followed by the percentage of battery life remaining.

### Calibration

Perform a quick and easy calibration after start-up:

1. Using a plastic pipette, completely cover the prism in the sample well with distilled or deionized water.
2. Press the ZERO key.

### Unit Selection

Just press the RANGE key to cycle through the HI96822's units of measurement. PSU, ppt, Specific Gravity (20/20).

### Measurement

Achieve fast, professional results:

1. Using a plastic pipette, drip sample onto the prism surface until the well is full.
2. Press the READ key and the results are displayed in the selected units.

### Making a Standard Sodium Chloride Solution

Sodium Chloride solutions can be used to check the accuracy of the meter. The table below lists two Sodium Chloride solutions and their expected ppt Seawater value. To make a Standard NaCl Solution (g/100 g), follow the procedure below:

- Place container (such as a glass vial or dropper bottle that has a cover) on an analytical balance.
- Tare the balance.
- To make an X NaCl solution weigh out X grams of high purity dried Sodium Chloride (CAS #: 7647-14-5; MW 58.44) directly into the container.
- Add distilled or deionized water to the beaker so the total weight of the solution is 100g.

#### Example Standard NaCl solution:

	NaCl (g)	Water (g)	Total	Expected Seawater Value (ppt)
3.5% NaCl	3.50	96.50	100.000	34
10% NaCl	10.00	90.00	100.000	96

### Specifications

	HI96822
PSU	Range 0 to 50
	Resolution 1
	Accuracy (@25°C/77°F) ±2
ppt	Range 0 to 150
	Resolution 1
	Accuracy (@25°C/77°F) ±2
Specific Gravity (S.G.)	Range 1.000 to 1.114
	Resolution 0.001
	Accuracy (@25°C/77°F) ±0.002
Temperature	Range 0 to 80°C (32 to 176°F)
	Resolution 0.1°C (0.1°F)
	Accuracy (@25°C/77°F) ±0.3°C (0.5°F)
Additional Specifications	Temperature Compensation automatic between 0 and 40°C (32 to 104°F)
	Measurement Time approximately 1.5 seconds
	Minimum Sample Volume 100 µL (to cover prism totally)
	Light Source yellow LED
	Sample Cell stainless steel ring and flint glass prism
	Auto-off after three minutes of non-use
	Enclosure Rating IP65
	Battery Type / Life 9V / approximately 5000 readings
	Dimensions 192 x 102 x 67 mm (7.6 x 4.01 x 2.6")
	Weight 420 g
Ordering Information	HI96822 is supplied with battery and instruction manual.

### Some specific examples of the importance of salinity:

**Aquaculture:** Young salmon start their lives in fresh water. As they mature, they reach a stage ("smolt") when they transition to salt water. When farming salmon, it is critically important to maintain proper salinity levels at each life stage to prevent unnecessary stress that could negatively affect growth and development.

Salinity is a vital parameter to monitor accurately when raising eggs and larval fish, optimizing juvenile and adult growth, and culturing live food such as rotifers and artemia.

**Aquaria:** Whether it is the world-renowned, eight million gallon Georgia Aquarium, or a 20 gallon reef tank at home, salinity is a crucial parameter to measure. In closed systems such as these, salinity is easily affected. As water evaporates, it leaves the salt behind, raising the salinity. When evaporated water is replaced with fresh water, the salinity is lowered. The potential for disaster is inherent in both situations. Use Hanna's digital refractometer to accurately measure salinity and to help prevent any mishaps.