HORIBA
Scientific

LAQUA

Lab-in-your-pocket.
A Rainbow of Choices.

Actual Size

pH | COND TDS | Na^+ | K^+ | NO_3^- | Ca^{2+} | Salt

Waterproof Pocket Water Quality Meter

WARRANTY 2 YEAR WARRANTY

MADE IN JAPAN

Compact Water Quality Meter

LAQUAtwin

Get accurate direct measurement from a single drop of sample on the unique flat sensor—a result of 60 years of HORIBA's sensor engineering technology. Select your LAQUAtwin from seven electrochemistry parameters such as pH, conductivity, various ions (Na^+, K^+, NO_3^-, Ca^{2+}) and salt concentration that best suits your purpose. It's simple & compact and is your lab-in-your-pocket. Use it wherever and whenever.

Quick!
No container is needed to calibrate or measure. Few drops of standards and samples are all you need.

Variety!
Measurements can be made in different positions because of the sensor design.

Anyone!
Easy & simple operation makes everyone an expert.

Solution!
Discover more with easy, on-site measurement.

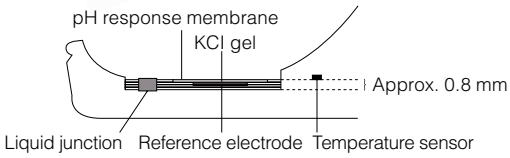
Wherever!
IP67 rated waterproof. Carry LAQUAtwin and its accessories in a carrying case.

Reliable!
HORIBA 60 years sensor technology distilled in HORIBA's unique flat sensor.

Cost effective
1/100 of standard solution and sample volume is needed. Sensor is replaceable.

Accurate reading from only a single drop, in a few seconds

Employing the same test principle as standard laboratory electrodes, the LAQUAtwin packs all the components into a flat sensor chip that's less than 1 mm thick.



● **Sectional drawing of tip of Flat sensor.**

pH, conductivity, ions and salt concentration. 7 parameters, 11 models.

Seven water quality parameters are available to suit your requirement, such as pH, conductivity, ion concentration (Na^+, K^+, NO_3^-, Ca^{2+}) and salt concentration. Incorporating the same principle as laboratory sensors, LAQUAtwin provides a reliable and accurate measurement.

Calibrate and measure at the touch of a button – the ☺ will tell you when the result can be read

Easy operation for both the measurement and indispensable calibration procedure. Read the data once a smiley face lights up.

LAQUAtwin is fully waterproof and dustproof[1] (IP67 rated)

The meter and sensor are fully waterproof so you can take it anywhere anywhere. No worries when water splashes during measurement or cleaning.

[1] IP67 rated. Will withstand immersion for 30 minutes at 1 m. Not suitable for underwater use.

Carrying case comes standard for storage & portability

The compact carrying case contains everything you need for your measurements, including the standard solution. You can attach a strap or tag on the strap hole.

● Attach a strap[3] or tag here.

[3]Strap not included

Unique measurement options with LAQUAtwin

One meter provides seven flexible measurement techniques. Simply choose the method that best fits your sample and situation.

LAQUAtwin

Drops

Drop a sample with a pipette; small volumes as 0.1 mL can be measured. Using sampling sheet B, volumes down to 0.05 mL can be tested.

Immersion

When you're in the lab, you can test the sample in a beaker. Ensure the sensor guard sliding cap is open.

Scoop

Use as a scoop to test water from a river. Vertical scoop is available with a unique sensor guard.

Wipe

The sampling sheet allows tiny, trace volumes to be analysed. For example, wipe off the surface of the skin with a sampling sheet soaked with pure water and measure.

Solid samples

Foods containing some moisture can be tested by placing a small piece directly onto the sensor.

Powders

LAQUAtwin meters can also test dry powders. Simply place the powder sample onto the sensor, and add an appropriate amount of pure water.

Paper, textiles and films

To test sheets of paper and textiles, cut up the sample into small pieces and place them directly onto the sensor then add a defined amount of pure water.

* All methods applicable to pH measurement * Conductivity models cannot be tested in solids, powders, and sheet-like samples * These pictures are for image purpose only

Easy measurement for all users

Meter
IP67 rated waterproof and dustproof.

Strap hole
You can attach a strap or tag here.

Measurement button
Press when ready to measure and for auto-hold.

On/Off button

Calibration button
Automatic calibration is easy with this button.

IP67 rated waterproof and dustproof.
Sensor is easily replaceable.

Sensor guard (light shield)
Sensor guard protects sensor. Integrated slide cap opens for scooping water samples. Open the whole sensor guard when placing water or solid samples directly on the sensor.

Slide cap

Battery alarm

Calibration mark
Calibration is complete when it stops flashing.

Measurement mark
Measurement is complete when it stops flashing.

Stability mark
Lights up when measurement is complete.

Temperature alarm
Flashes when the temperature is out of range.

Voltage measurement mode
Displays sensor voltage.

Measurement value
Flashes when the measurement value is out of the range.

pH mV

pH 11 Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL | 0.1 pH

pH mV

pH 22 Meter

WATER PROOF | MICRO VOLUME | 3 PT CAL | 0.01 pH

pH mV Temp

pH 33 Meter

WATER PROOF | MICRO VOLUME | 5 PT CAL | 0.01 pH

Feature

Flat pH sensor with temperature compensation offers a reliable and quick direct measurement of micro-samples from 100 µL.

Applications include

Fresh water testing; aquarium; affluent treatment; soil & food testing; research laboratories; QC education, etc.

	pH		
Model	pH 11	pH 22	pH 33
Measurement principle	Glass electrode method		
Minimum sample volume			
Measurement range			
Resolution			
Calibration	Two-point	Three-point	Five-point
Accuracy	± 0.1 pH		
Calibration curves	USA / NIST		
Functions	Temperature compensation • IP67 Water/Dust Proof		
Display	Custom		
Operating temperature/ humidity			
Battery life			
Main Material			
Dimensions/Mass			
Accessories included			
Ordering Code	3999960122	3999960123	3999960124

TDS Calibration Curves

Application	Key chemical species	TDS selection
Aquaculture, pickling	NaCl	NaCl
Boiler water, HVAC	Na_2SO_4, $NaHCO_3$, NaCl	442 (Myron)
Environmental (YSI, U50, Horiba)	EN standard for environmental water	EN 27888
General application	Not known	KCl (linear factor) Default: 0.5 Selectable: 0.4 to 1.0

COND

EC 11 Conductivity Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL | ~19.9 mS/com

COND | Temp

EC 22 Conductivity Meter

WATER PROOF | MICRO VOLUME | 3 PT CAL | ~199.9 mS/com

COND | TDS | Temp

EC 33 Conductivity/TDS Meter

WATER PROOF | MICRO VOLUME | 3 PT CAL | ~199.9 mS/com

Salt | Temp

Salt 11 Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL | EC CONV

Feature

Conductivity and TDS measurement. Autoranging & temperature compensation for higher accuracy.

Applications include

Fresh water testin; aquaria; soil; salt water damage; surface cleanliness and improved paint adhesion.

Feature

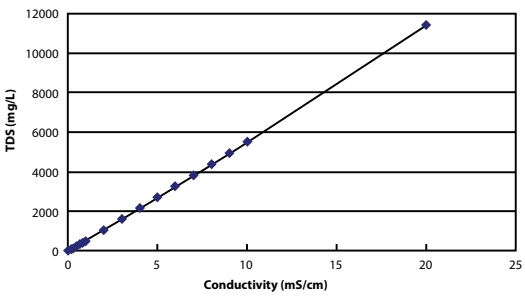
Robust Titanium Cell resists corrosion. NaCl and seawater cal curves for accurate salinity readings.

Applications include

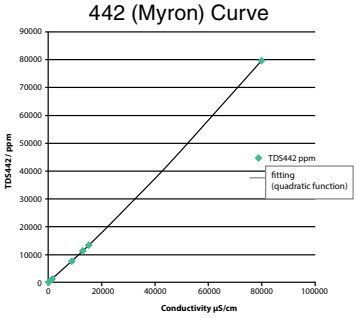
Agriculture; shrimp farming; food quality control, health management

	Conductivity (EC)			Salt (NaCl)
	EC 11			
	2 electrode bipolar AC Titanium coated with Platinum black			
	0.12 mL			
	Conductivity: 0 to 199 µS/cm 200 to 1999 µS/cm 2.00 to 19.99 mS/cm	Conductivity: 0 to 199 µS/cm 200 to 1999 µS/cm 2.00 to 19.99 mS/cm 20.0 to 199.9 mS/cm		0.0 to 100.0 ppt (0.00 to 10.00 %)
		—	TDS: 0.0 to 99.9 ppm 100 to 999 ppm 1000 to 9990 ppm	
	Conductivity: 1 µS/cm 1 µS/cm 0.01 mS/cm	Conductivity: 1 µS/cm 1 µS/cm 0.01 mS/cm 0.1 mS/cm		0.1 ppt (0.01 %)
		—	TDS: 0.1 ppm; 1 ppm; 10 ppm	
	Two-point	Three-point		Two-point
	±2% F.S. ±1 digit (for each range)			±10% of reading value
	TDS Factor (0.4 to 1.0) / EN 27888 / 442 / NaCl (see information below)			NaCl / Sea water
	• Auto Hold • Auto Stable • Automatic power off (30 minutes)			
	(monochrome) digital LCD			
	ABS epoxy			
	3999960125	3999960126	3999960127	3999960128

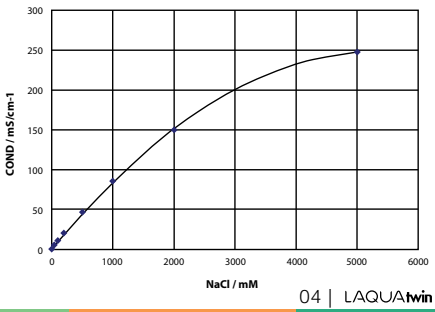
EN 27888 Curve



442 (Myron) Curve



NaCl Curve



Na^+

B-722 Sodium Ion Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL

Applications include

Health management; food quality control; environmental measurement; salt water damage testing.

K^+

B-731 Potassium Ion Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL

Applications include

Soil testing; food quality control; cultivation management; health management

NO_3^- Temp

B-743 Nitrate Ion Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL

Applications include

Soil testing; food quality control; cultivation management; Growth management of crops.

Ca^{2+} Temp

B-751 Calcium Ion Meter

WATER PROOF | MICRO VOLUME | 2 PT CAL

Applications include

Soil testing; food quality control; cultivation management; health management; breeding water of coral; water hardness measurement

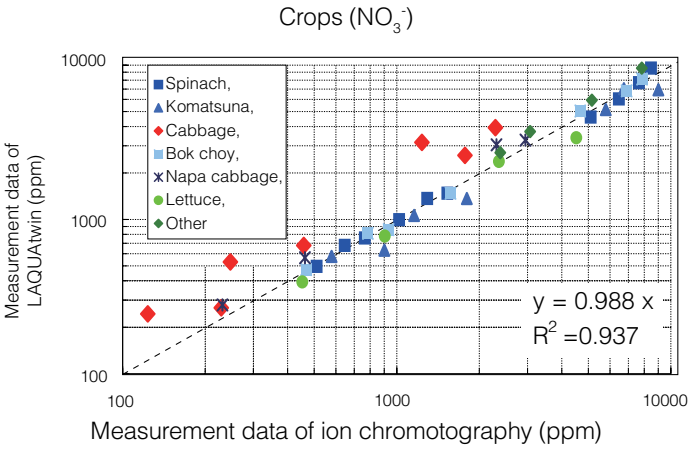
	Sodium Ion (Na+)	Potassium Ion (K+)	Nitrate Ion (NO_3^-)	Calcium Ion (Ca^{2+})
Model	B-722	B-731	B-743 - General	B-751
Measurement principle	Ion electrode method			
Minimum sample volume	0.3 mL (0.05 mL with sampling sheet B)			
Measurement range	23 to 2300 ppm (mg/L) (10^{-3} to 10^{-1} mol/L)	39 to 3900 ppm (mg/L) (10^{-3} to 10^{-1} mol/L) 20 to 2000 kg/10a (soil/water sampling ratio 1:5)	NO_3^-: 62 to 6200 ppm (mg/L) (10^{-3} to 10^{-1} mol/L) NO_3^--N: 14 to 1400 ppm (mg/L)	40 to 4000 ppm (mg/L) (10^{-3} to 10^{-1} mol/L)
Resolution	• 0 to 1.0 ppm: 0.1 ppm • 0 to 99 ppm: 1 ppm • 100 to 990 ppm: 10 ppm • 1000 to 9900 ppm: 100 ppm			
Calibration	Two-point			
Accuracy	±10% of reading value			±20% of reading value
Compensation setting	Multiplication (0.01 to 9.90) or Known Factor (-1000 to 1000)			
Functions	Auto range change • Temperature compensation • IP67 Water/ Dust proof • Auto Hold • Automatic power off (15 minutes)			
Display	Custom (monochrome) digital LCD			
Operating temperature/ humidity	5 to 40°C, 85% or less in relative humidity (no condensation)			
Battery life	Approx. 400 hours in continuous use with x2 CR2032 batteries			
Main Material	ABS epoxy			
Dimensions/Mass	164 mm x 29 mm x 20 mm (excluding projections)/Approx. 50 g (meter only, without batteries, EC meters approx. 45 g)			
Accessories included	2 CR2032 batteries • 1 Pipette • Instruction manual • Quick manual • Storage case • 2 x 14 mL Standard solutions (high & low) • 5 pieces of sampling sheet B			
Ordering Code	3200456565	3200456566	3200456569	3200456570

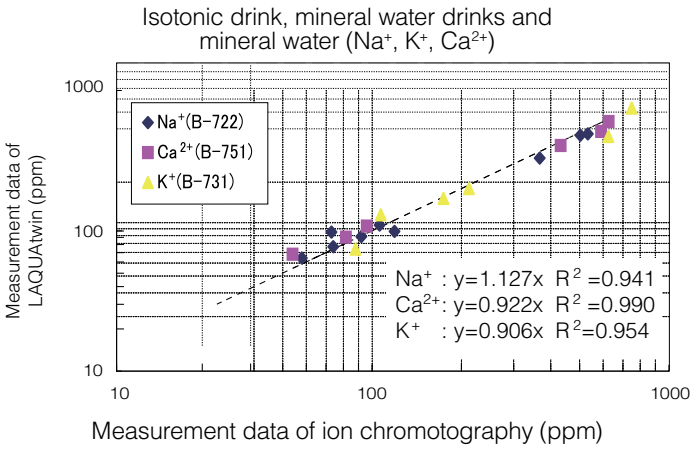
Interfering ion influence [Refer to right hand side for details]

	Sodium Ion (Na^+)	Potassium Ion (K^+)	Nitrate Ion (NO_3^-)	Calcium Ion (Ca^{2+})
Selectivity coefficient	K^+, Rb^+ = 1 x 10^{-2} Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}= 1 x 10^{-4} Li^+= 1 x 10^{-3} Cs^+= 3 x 10^{-3} NH_4^+= 6 x 10^{-3}	Rb^+= 1 x 10^{-1} Mg^{2+}= 1 x 10^{-5} NH_4^+= 7 x 10^{-3} Ca^{2+}= 7 x 10^{-7} Cs^+= 4 x 10^{-3} Na^+= 3 x 10^{-4}	I^-= 10 Cl^-= 4 x 10^{-2} Br^-= 9 x 10^{-1} ClO_4^-= 3 x 10^{-3} NO_2^-= 7 x 10^{-1}	Na^+, K^+, Mg^{2+}= 1 x 10^{-3} Fe^{2+}, Zn^{2+}= 1 Fe^{3+}= 10 Cu^{2+}= 1 x 10^{-2}
pH range	pH 3-9 (at 10^{-3} mol/L Na^+)	pH 2-9 (at 10^{-3} mol/L K^+)	pH 2-9 (at 10^{-3} mol/L NO_3^-)	pH 4-12 (at 10^{-3} mol/L Ca^{2+})

Selectivity coefficient is a concentration ratio of the interfering ion against the target ion, which affects the target ion measurement value. For example, selectivity coefficient of potassium ion against sodium ion is 1×10-2, which means for the same concentration of potassium ion and sodium ion coexisting in a sample, the sodium measurement shows approximately 1×10-2(1%) higher result.

Correlation between LAQUAtwin measurement data and ion chromatography





*When measuring Ca^{2+}, we are pretreated in order to match the conditions of the ion chromatography.

LAQUAtwin Replacement Sensors			
S010	3200459834	pH Sensor	(for B-712, B-713, pH 11, pH 22 & pH 33)
S021	3200459866	Salt Sensor	(for B-721)
S022	3200459867	Sodium Ion Sensor	(for B-722)
S030	3200459868	Potassium Ion Sensor	(for B-731)
S040	3200459870	Nitrate Ion Sensor	(for B-743, B-742 & B-741)
S050	3200459869	Calcium Ion Sensor	(for B-751)
S070	3200459672	Conductivity Sensor	(for B-771, EC 11, EC 22, EC 33)
S071	3200597237	Salt EC Sensor	(for Salt 11)
LAQUAtwin Standard Solution (packaging consists of 6 x 14ml bottles)			
514-4	3999960108	pH buffer	4.01
514-7	3999960109	pH buffer	7.00
514-22	3999960110	Conductivity Standard	1413 uS/cm
514-23	3999960111	Conductivity Standard	12.9 mS/cm
514-05	3999960112	NaCl Standard	0.5%
514-50	3999960113	NaCl Standard	5.0%
514-20	3999960114	Conditioning	for Conductivity/Salinity
Y022H	3200457723	Sodium Ion Standard	2000 ppm
Y022L	3200457724	Sodium Ion Standard	150 ppm
Y031H	3200457719	Potassium Ion Standard	2000 ppm
Y031L	3200457720	Potassium Ion Standard	150 ppm
Y041	3200053433	Nitrate Ion Standard	5000 ppm
Y042	3200053514	Nitrate Ion Standard	300 ppm
Y043	3200053532	Nitrate Ion Standard	2000 ppm
Y044	3200053535	Nitrate Ion Standard	30 ppm
Y045	3200053536	Nitrate Ion Standard	150 ppm
Y051H	3200457727	Calcium Ion Standard	2000 ppm
Y051L	3200457728	Calcium Ion Standard	150 ppm
LAQUAtwin Accessories			
Y046	3200053858	Sampling Sheet B	
Y048	3200459736	Sampling Sheet Holder	

LAQUAtwin Replacement Sensors

pH Buffer Solutions

Conductivity Standard Solutions

NaCl Standard Solutions

Sodioum Ion Standard Solutions

Potassium Ion Standard Solutions

Calcium Ion Standard Solutions

Nitrate Ion Standard Solutions

Interfering Ion Influence

Though **Ion Selective Electrodes (ISE)** are selective to one ion, other related ions may also be detected. The Ion to be determined is called the determinant or target ion, and all other ions to which the respective ion selective electrode responds are known as interferents or interfering ions. Higher concentrations of the target ion will have less influence from interfering ions and vice versa.

The respective Ion Selective Electrode preference for the target ion over the interfering ions can be calculated and presented as the **Selectivity Coefficient (K)**. Each electrode has its own coefficient and is also dependent on the individual manufacturer's specifications.

For example, if the target ion is Na^+ and the interfering ion is K^+, the Selective Coefficient, $K_{target,\ interf}$ ($K_{Na^+,\ K^+}$) = 0.01 (or 1 x 10^{-2}). In other words, when both Na^+ and K^+ coexist in the same sample in the same concentration, the influence of the interfering K^+ ion on the Na^+ measurement is higher by 1%.

Visit HORIBA's website!

Water Quality Analyzers www.horiba-water.com

With over 60 years of engineering excellence, HORIBA's diverse range of water quality analyzers and electrodes are ideal for everyday laboratory needs through to the most demanding of applications. Visit our website for a wealth of useful information and water quality measurement tips to help you obtain the best results in your work.

Benchtop Meters

Developed using extensive feedback from users, our new LAQUA meters deliver the best solution for water quality analysis. Our LAQUA website features an online 'Selection Guide' to enable you to find the perfect LAQUA meter and electrode for your need.

Handheld Meters

In the lab, in the field or anywhere you need it. LAQUA Handheld meters are designed for use with one hand and with an IP67 waterproof rating and shock-resistant casing. Meters can be used for long periods, even in dark places, making it ideal for field measurements in rivers and lakes.

Electrodes

Various electrodes to match any application. A wide range of products for both benchtop and portable systems are available, including easy and reliable standard models, application-focused models for small samples or large containers, and special electrodes for specific sample characteristics.

Application Notes

LAQUAtwin pocket meters offer quick and convenient alternative to analyze important parameters with high accuracy. Several application notes are available at (http://goo.gl/znwE6j) detailing the use of LAQUAtwin and the results achieved for the respective applications. Additional application notes will be added when available.

SUPPORT HORIBA CUSTOMER SUPPORT SYSTEM

HORIBA offers a variety of services to conform to quality standards and international guidelines such as GLP, GMP and ISO

Technical Support

Please contact us with any technical questions about our products.

www.horiba.com/wq/support

User Support

Our support website is available for registered customers and features:

- Data collection software
- Instruction manual downloads
- Measurement tips, etc.

www.horiba.co.jp/register

Validation Support

Please contact us with any questions or requirements for your validation procedure.

- Traceability certification*
- IQ/OQ/PQ support*
- SOP guidance
- FAQ

*Optional services

⚠ Please read the operation manual before using this product to assure safe and proper handling of the product.

http://www.horiba.com **e-mail: enquiry@horiba.com.sg**

HORIBA Instruments (Singapore) Pte. Ltd.
83 Science Park Drive
#02-02A, The Curie
Singapore 118258
Phone: 65 (6) 908-9660
Fax: 65 (6) 745-8155

ISO9001 ISO14001 IMS HORIBA Group is operating Integrated Management System OHSAS18001

Brochure PBT-12-2014A