

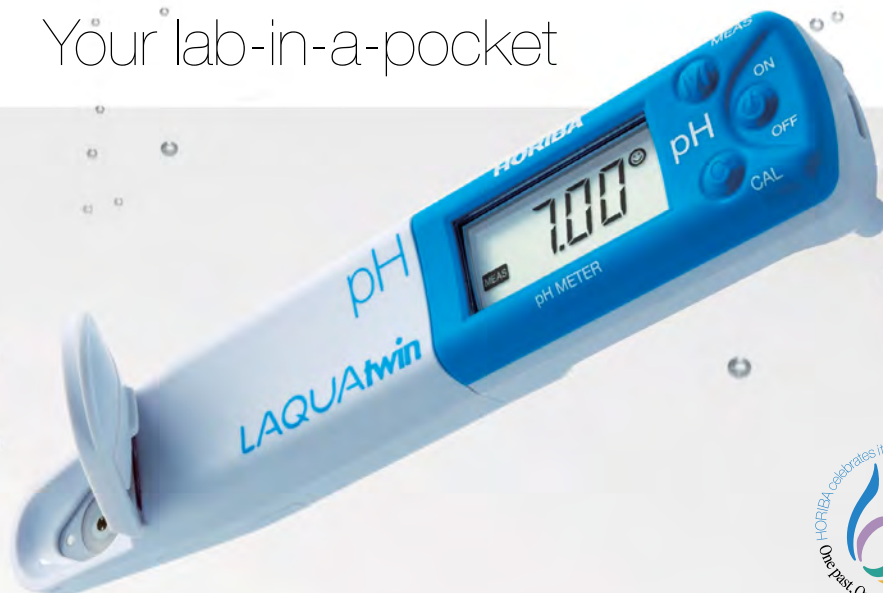
**HORIBA**  
Scientific



Compact Water Quality Meter

# LAQUAtwin

Your lab-in-a-pocket



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Your lab-in-a-pocket

Water quality is fundamental for the health of the environment and all living things.

With LAQUAtwin meters, accuracy, simplicity and reliability are assured, so you can be confident about the quality of the water you're testing.

From seas, lakes and rivers, to soil, crops and the food we eat, water is essential for life.

Knowing the purity and ionic characteristics of water in these environments is therefore vital to maintaining the health of the world in which we live.

Find out easily with LAQUAtwin compact water quality meters.



# pH

Accurate pH measurements in a few seconds, from a single drop.\*

Water pH varies in different environments, and a slight change can often have a major effect.

Whether you need to keep the pH of an aquarium within tight limits, are checking for the acidity of rain water or for the quality of meat and fish products, LAQUAtwin compact pH meters are ideal for you. No matter where and when you need to test.

Applications include:

Fresh water testing (rain, rivers, lakes, hot springs); aquaria; drainage treatment solutions; soil testing for improved agriculture; fermentation and brewing; food freshness testing; research laboratories; QC of medical supplies and cosmetics; preventative dentistry; school education, etc.

\* Minimum volume required - 0.1 mL (0.05 mL when using the HORIBA sampling sheet. Additional sampling sheets available from HORIBA as 100 pcs/box)





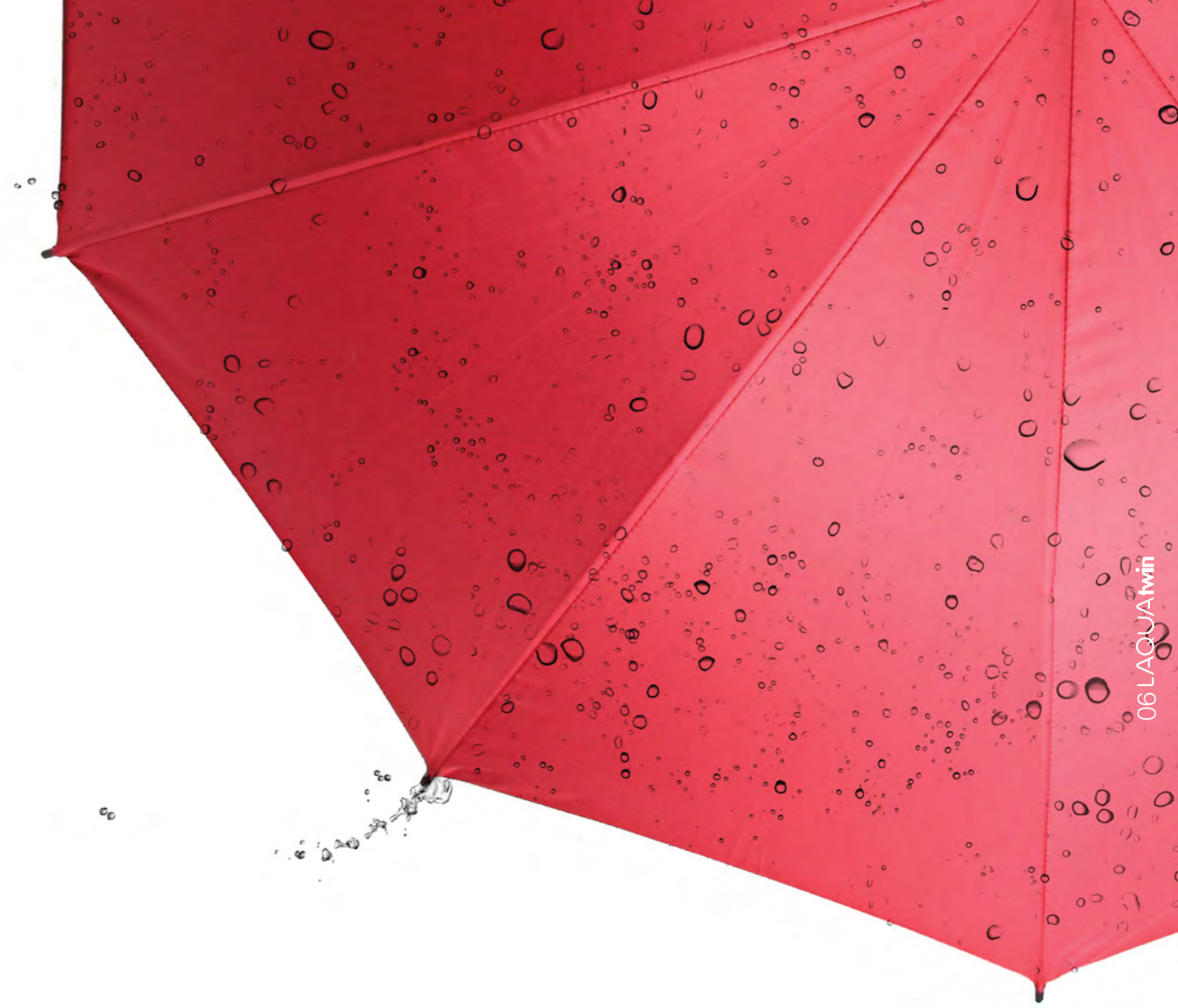
# COND

Determine water conductivity with as little as 0.12 mL of sample.

The conductivity of rain water is a trusted guide to determining atmospheric purity. In agriculture, measuring the conductivity of soil allows farmers and agronomists to determine optimum fertilizer usage and check the 'health' of soil after salt water damage. The LAQUAtwin meter makes conductivity testing simple, anywhere.

Applications include:

Fresh water testing (rain, rivers, lakes, hot springs); aquaria; soil testing for improved agriculture and analysis of salt water damage; analysis of surface cleanliness prior to coating; and improved paint adhesion.



Ca<sup>2+</sup> K<sup>+</sup> NO<sub>3</sub><sup>-</sup> Na<sup>+</sup> Salt

# Ions & Salt



Measure ion content with just 0.3 mL of sample.\*

The correct concentrations of salt, together with nitrate, calcium, potassium and sodium ions are essential to the health of all living things. The LAQUAtwin range of compact meters provides accurate measurements of these parameters from the smallest of samples.

Applications include:

Soil and sap testing for improved agriculture; food testing\*\*

\* 0.05 mL when using the HORIBA sampling sheet (additional sampling sheets available from HORIBA as 100 pcs/box)

\*\* Detection of ions in water only; electrolytes in oils cannot be measured. Ion measurement can be affected by non-target ions (see page 18 for details).



The world becomes more dynamic and vivid the more you find out about it! LAQUAtwin meters help you make informed decisions in any situation.

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#### Education changes

Measure seven different parameters in free water, samples and solutions with the LAQUAtwin range of compact meters.



#### Improved health

Control your salt intake by measuring the salt concentration of your food with the NaCl LAQUAtwin meter.

#### Better tasting food

Nitrate fertilizers in agriculture affect the taste of the food that we eat. Check the level of nitrate ions with the  $\text{NO}_3^-$  LAQUAtwin meter.



#### Your "lab-in-a-pocket"

With LAQUAtwin compact meters, you don't have to take your sample back to the lab. Simply start measuring wherever and whenever you want to.

#### Make decisions with confidence, on-site

Save time and money by taking easy, quick, inexpensive and accurate measurements on-site, before deciding whether further analysis is required. Just one drop is enough, so it's easy even with precious or limited samples.

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LAQUAtwin

COLORFUL  
FUNCTIONS

## 3 STEPS

Easy, three-step measurement

Follow simple, good testing procedures for accurate and dependable results:

- Calibrate correctly
- Avoid mixing samples and standards
- Always keep the sensor clean



## 01 Calibrate → 02 Test → 03 Clean

Always ensure the sensor is clean before calibrating. If not, clean thoroughly with water (don't worry, LAQUAtwin meters are completely waterproof!)

Place some standard solution on the sensor and press the calibration button. Once the smiley face appears indicating that calibration is complete, wash off the standard solution with water and dry with a clean, soft tissue.

LAQUAtwin meters only need a tiny amount of sample - so no beaker is necessary. Fill the sensor with the sample and when the smiley face appears, the measurement is complete.

Clean the sensor thoroughly with water ready for the next test. When the sensor is nearing the end of its usable lifetime, it can be replaced;\* you don't need to replace the meter.

\* Sensors will need to be replaced after approx. 1500 measurements or when calibration cannot be completed. Sensors are sold separately and are easily removed and replaced.

1 X 6

One meter. Six different methods\*<sup>1</sup>

Only the LAQUAtwin range allows you to be this flexible!

Chose the best method according to your sample, your situation and your needs.



## 01 Immersion

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



## 02 Scoop

Use as a scoop to test water, for example from a river.



## 03 Drops

LAQUAtwin meters can measure sample volumes as low as 0.05 mL<sup>2</sup>. Place a drop of the sample onto the sensor with a pipette.



## 04 Solid samples

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



## 05 Powders

LAQUAtwin meters can also test dry powders. Simply place the powder sample onto the sensor, and drop on your defined volume of pure water.



## 06 Paper and textiles

To test sheets of paper and textiles, cut up the sample into small pieces and place directly onto the sensor. Drop on your defined volume of pure water.



Testing has never been easier! LAQUAtwin meters have been developed using 60 years of HORIBA know-how to give you the highest quality technology that can be used anywhere and at any time. And they're so simple to use that you won't need any training!

## ONE TOUCH

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

Hassle-free automatic calibration with a few drops of standard solution reassures you of your measurement accuracy. Two-point calibration is also possible.<sup>3</sup>



LAQUAtwin: the only meters with flat sensor technology.

HORIBA's highly-sensitive, flat sensor technology opens up new possibilities for sampling and sample types. Only a small amount of sample is required, so you can easily sample in situ without the need for beakers or other labware. Sensors are easily replaced as required.

Measure even smaller samples with the LAQUAtwin sampling sheet.<sup>2</sup>

The sampling sheet allows trace volumes to be analyzed. For example, you can even measure the pH of human skin by wiping with a sampling sheet soaked in pure water, and placing it on the sensor.



Carry case comes as standard for handy portability

The compact carry case contains everything you need for your measurements, including the standard solution and sampling sheets.

LAQUAtwin is IP67 rated.

The meter and sensor are fully waterproof<sup>4</sup> and dustproof, so you can take it anywhere.

\*1 B-771 (conductivity) cannot be tested in solids or powders.

\*2 Using the HORIBA sampling sheet, volumes down to 0.05 mL can be tested (except for conductivity measurements).

\*3 Except for B-711

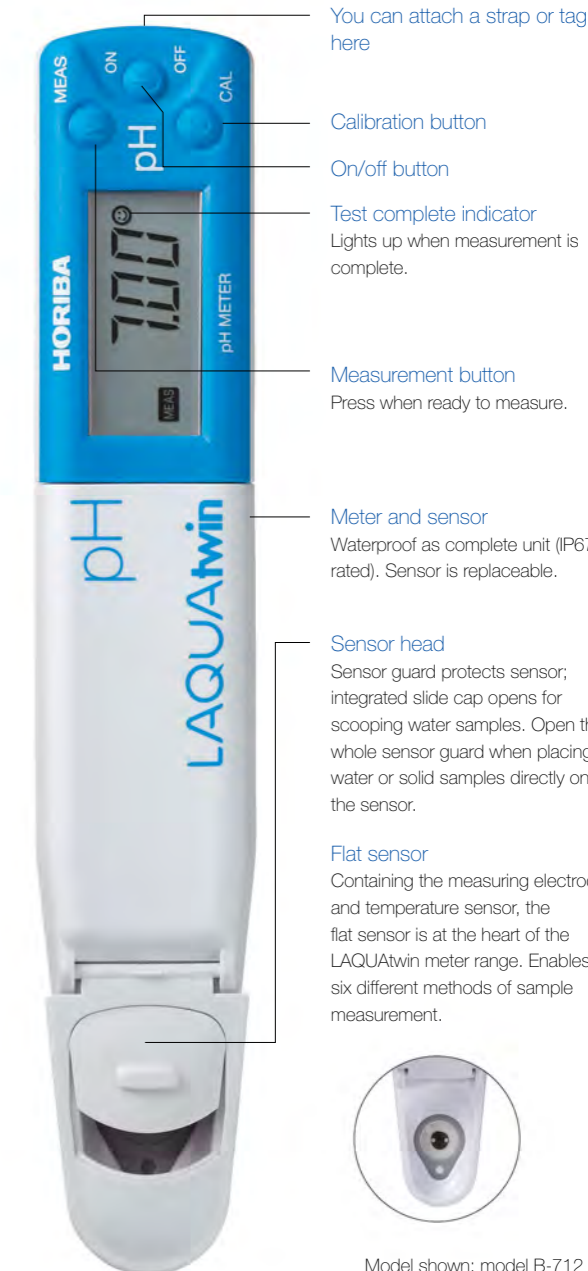
\*4 Will withstand immersion for 30 minutes at 1 m. Not suitable for underwater use.



# LAQUAtwin Lineup



	pH			Conductivity	Sodium Ion	Potassium Ion	Nitrate Ion			Calcium Ion	Salt							
Model	B-711	B-712	B-713 (US only)	B-771	B-722	B-731	B-741 (for crops)	B-742 (for soil)	B-743 (for general use)	B-751	B-721							
Measurement principle	Glass electrode method			2 AC bipolar			Ion electrode method											
Minimum sample volume	0.05 mL <sup>1</sup> , 0.1 mL or more			0.12 mL or more			0.05 mL <sup>1</sup> , 0.3 mL or more											
Measurement range	2 to 12 pH			Conductivity: 0 to 19.9 mS/cm (0 to 1.99 S/m) Salt: 0 to 1.1% TDS: 0 to 9900ppm			23 to 2300 ppm (mg/L) (10 <sup>-3</sup> to 10 <sup>-1</sup> mol/L)		39 to 3900 ppm (mg/L) (10 <sup>-3</sup> to 10 <sup>-1</sup> mol/L) 20 to 2000 kg/10a <sup>2</sup>		NO <sub>3</sub> <sup>-</sup> :100 to 9900 ppm (mg/L) NO <sub>3</sub> <sup>-</sup> -N:23 to 2200 ppm (mg/L) NO <sub>3</sub> <sup>-</sup> :30 to 600 ppm (mg/L) NO <sub>3</sub> <sup>-</sup> -N:6.8 to 140 ppm (mg/L) :3.4 to 68 kg/10a <sup>2</sup>		NO <sub>3</sub> <sup>-</sup> :62 to 6200 ppm (mg/L) (10 <sup>-3</sup> to 10 <sup>-1</sup> mol/L) NO <sub>3</sub> <sup>-</sup> -N:14 to 1400 ppm (mg/L)		40 to 4000 ppm (mg/L) (10 <sup>-3</sup> to 10 <sup>-1</sup> mol/L)		0.1 to 10% by weight	
Display range <sup>3</sup>	0 to 14 pH			0 to 199mS/cm (0 to 19.9 S/m)			0 to 9900 ppm(mg/L)			0 to 800 ppm(mg/L)		0 to 9900 ppm(mg/L)		0.00 to 25% by weight				
Range and Resolution	0.1 pH	0.1/0.01 pH (Selectable)	0.1/0.01 pH (Selectable)	1) 0 to 199 μS/cm : 1 μS/cm 2) 0.20 to 1.99 mS/cm : 0.01 mS/cm 3) 2.0 to 19.9 mS/cm : 0.1 mS/cm 4) 20 to 199 mS/cm : 1 mS/cm			1) 0 to 1.0 ppm : 0.1 ppm 2) 0 to 99 ppm : 1 ppm 3) 100 to 990 ppm : 10 ppm 4) 1000 to 9900 ppm : 100 ppm			Two-point <sup>4</sup>		Two-point <sup>4</sup>		1) 0.00 to 0.99 % : 0.01% by weight 2) 1.0 to 9.9 % : 0.1% by weight 3) 10 to 25 % :1% by weight				
Calibration	One-point	Two-point <sup>4</sup>	Two-point <sup>4</sup>	Two-point <sup>4</sup>			Two-point <sup>4</sup>											
Accuracy <sup>5</sup>	±0.1 pH			±2%F.S.±1digit (for each range) <sup>6</sup>			±10% of reading value			±20% of reading value		±10% of reading value						
Functions	Temperature compensation • IP67 Water/Dust proof <sup>7</sup> • Auto hold • Automatic power off (30 minutes)			Salt/TDS Measurement • Auto range change • Temperature conversion (2%/°C fixed) • IP67 Water/Dust proof <sup>7</sup> • Auto hold • Automatic power off (15 minutes)			Auto range change • Temperature compensation • IP67 Water/Dust proof <sup>7</sup> • Auto hold • Automatic power off (30 minutes)											
Display	Custom (monochrome) Digital LCD																	
Operating temperature/humidity	5 to 40°C, 85% or less in relative humidity (no condensation)																	
Power	CR2032 batteries (x2)																	
Battery life	Approx. 400 hours in continuous use																	
Main Material	ABS epoxy																	
Dimensions /Mass	164mm × 29mm × 20mm (excluding projections) / Approx. 50 g (meter only, without batteries, B-771 approx. 45 g)																	
Accessories included	2 CR2032 batteries/1 Pipette/Instruction manual/Quick manual/Storage case																	
	Standard solution (pH7) (14 mL), 5 pieces of Sampling sheet B	Standard solution (pH4 & pH7) (14 mL), 5 pieces of Sampling sheet B	Standard solution (pH4 & pH7 <sup>8</sup> ) (14 mL), 5 pieces of Sampling sheet B	Standard solution (1.41 mS/cm) (14 mL), Treatment reagent (14 mL) For the high conductivity standard solution (12.9 mS/cm) is sold separately	Standard solution (150 ppm & 2000 ppm) (14mL), 5 pieces of Sampling sheet B	Standard solution (150 ppm & 2000 ppm)(14mL), 5 pieces of Sampling sheet B	Standard solution for crops (300 ppm & 5000 ppm) (14 mL) Kit for crops <sup>9</sup>	Standard solution for soil (30 ppm, 300 ppm) (14 mL) Kit for soil <sup>10</sup>	Standard solution (150 ppm & 2000 ppm) (14 mL), 5 pieces of Sampling sheet	Standard solution (150 ppm & 2000 ppm) (14 mL), 5 pieces of Sampling sheet	Standard solution (0.5%, 5%)(14 mL), 5 pieces of Sampling sheet							



Model shown: model B-712 (pH)

Interfering ion influence Selectivity coefficient and pH range

- Sodium ion (Na<sup>+</sup>)** K<sup>+</sup>, Rb<sup>+</sup> = 1x10<sup>-2</sup> / Ba<sup>2+</sup>, Sr<sup>2+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup> = 1x10<sup>-4</sup> / Li<sup>+</sup> = 1x10<sup>-3</sup> / Cs<sup>+</sup> = 3 x 10<sup>-3</sup> / NH<sub>4</sub><sup>+</sup> = 6x10<sup>-3</sup> / pH Range: pH 3-9 at 10<sup>-3</sup> mol/L Na<sup>+</sup>
- Potassium ion (K<sup>+</sup>)** Rb<sup>+</sup> = 1x10<sup>-1</sup> / Mg<sup>2+</sup> = 1x10<sup>-5</sup> / NH<sub>4</sub><sup>+</sup> = 7x10<sup>-3</sup> / Ca<sup>2+</sup> = 7x10<sup>-2</sup> / Cs<sup>+</sup> = 4x10<sup>-3</sup> / Na<sup>+</sup> = 3x10<sup>-4</sup> / pH range: pH 2-9 at 10<sup>-3</sup> mol/L K<sup>+</sup>
- Nitrate ion (NO<sub>3</sub><sup>-</sup>)** I<sup>-</sup> = 10 / Cl<sup>-</sup> = 4x10<sup>-2</sup> / Br<sup>-</sup> = 9x10<sup>-1</sup> / ClO<sub>4</sub><sup>-</sup> = 3x10<sup>-3</sup> / NO<sub>2</sub><sup>-</sup> = 7x10<sup>-1</sup> / pH range: pH 3-8 at 10<sup>-3</sup> mol/L NO<sub>3</sub><sup>-</sup>
- Calcium ion (Ca<sup>2+</sup>)** Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup> = 1x10<sup>-3</sup> / Fe<sup>2+</sup>, Zn<sup>2+</sup> = 1 / Fe<sup>3+</sup> = 10 / Cu<sup>2+</sup> = 1 x 10<sup>-2</sup> / pH range: pH 4-12 at 10<sup>-3</sup> mol/L Ca<sup>2+</sup>

<sup>1</sup> By using the sampling sheet B. Please close the light shield cover. If a sample that contain particulate, please use "Sampling sheet holder" (sold separately)  
<sup>2</sup> With soil/water sampling ratio of 1:5  
<sup>3</sup> The display value flashes when out of the range.  
<sup>4</sup> Selectable between one-point and two-point calibrations. High conductivity standard solution (12.9 mS/cm) is sold separately.  
<sup>5</sup> Repeatability in measurement of a standard solution after calibration.  
<sup>6</sup> ①±5 μS/cm (0 to 199 μS/cm) ②±0.05 mS/cm(0.20 to 1.99 mS/cm) ③±0.5 mS/cm (2.0 to 19.9 mS/cm) ④±5 mS/cm (20 to 199 mS/cm)  
<sup>7</sup> IP67: no failure when immersed in water at a depth of 1 meter for 30 minutes. But the product can not be used underwater.  
<sup>8</sup> B-712:pH 6.86/B-713:pH 7.00 for US market  
<sup>9</sup> Kit for crops includes: 4 Pipettes, Cleaning solution bottle (250 mL), Crop sample press. 3 Medical cups, Quick manual, Carrying case  
<sup>10</sup> Kit for soil includes: 4 Pipettes, Cleaning solution bottle (250 mL), 3 Extraction bottles (100 mL), 2 sets of spoon for soil sampling, Tweezers, Sampling sheet B, 2 Sampling sheet holders, Quick manual, Carrying case

# Glossary

pH

From 0 to 14, pH shows the acidity or alkalinity of water. Pure, neutral water has a pH of 7. Any solution with a pH below 7 is acidic, and above 7, it's alkaline.

COND  
Conductivity

Conductivity is a measure of the ease with which electric current flows in a substance. Pure water doesn't conduct electricity, and it is only when electrolytes are present in water that it becomes conductive. By measuring the conductivity, you can determine the amount of electrolytes present in the water sample.

Na<sup>+</sup>  
Sodium ion

Sodium is an essential electrolyte for good health, however increased sodium consumption is associated with hypertension in humans. Testing the level of sodium ions in food is therefore important in ensuring healthy eating.

K<sup>+</sup>  
Potassium ion

Potassium is an important electrolyte for life and is contained in many foods. As an essential element in plant growth, it is one of three key constituents in fertilizers along with nitrogen and phosphate.

NO<sub>3</sub><sup>-</sup>  
Nitrate ion

Ammonia from fertilizer or livestock waste oxidizes to produce nitrate which is essential to plant growth (together with potassium and phosphate).

Ca<sup>2+</sup>  
Calcium ion

Another mineral essential to animals and plants. In an industrial setting, calcium is contained in cement, alkaline chemicals, snow melting agents etc., and it's also important in iron and steel manufacture.

Salt

Most salt concentration meter readings are based on conductivity, which means all ions present in the sample influence the "salt concentration". The LAQUAtwin salt meter detects only sodium ions, so salt readings are strictly based on the amount of NaCl in the sample, giving you the most accurate reading.

Flat sensor

Employing the same test principle as standard laboratory electrodes, the LAQUAtwin packs all components<sup>\*1</sup> into a flat sensor that's less than 1mm thick. Tests liquids in trace volumes, and can also be used for solids, powders, and paper/materials (containing moisture).<sup>\*2</sup>

\*1 B-711/712/713 (pH) incorporates a glass membrane and a reference electrode. B-771 (conductivity) incorporates an electrical conductivity cell. Ion meters and the sodium salt meter incorporate an ion membrane and reference electrode.

\*2 B-771 (conductivity) does not work with solids, powders or paper/materials.

Ion electrode

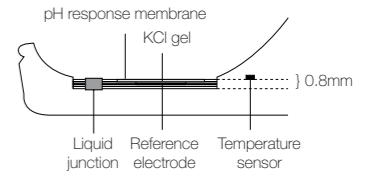
The LAQUAtwin ion electrode is an ion-selective electrode that produces an electric potential according to the concentration of the specific ion in solution. Results are produced very quickly and correlate closely to ion chromatography measurements, the gold standard analytical method (see figure on right).  
The ion electrode may be subject to interference from other ionic species. The selectivity coefficient reflects the affinity between each ionic species and the electrode, and is used to correct for the influence of competing ions. For example, the selectivity coefficient of potassium ions to the sodium ion electrode is 1x10<sup>-2</sup>, so when a sodium ion and a potassium ion coexist at the same concentration, the measured value of the sodium ion is displayed as 1%(10<sup>-2</sup>) higher. Please see the operator manual for further details.

Calibration

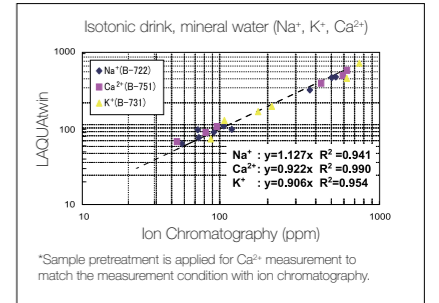
The simple calibration procedure ensures reliable and accurate measurements by referencing to a known standard solution.

Temperature Compensation

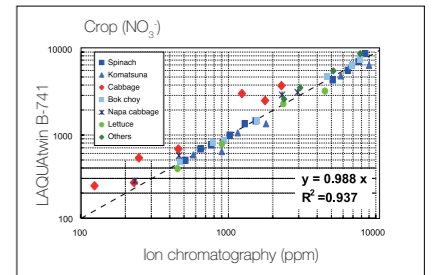
A pH sensor's sensitivity is influenced slightly by temperature. LAQUAtwin pH meters include a temperature sensor to correct for the influence of temperature to give a more accurate pH measurement. This function does not correct the actual change in pH due to changes in sample temperature.



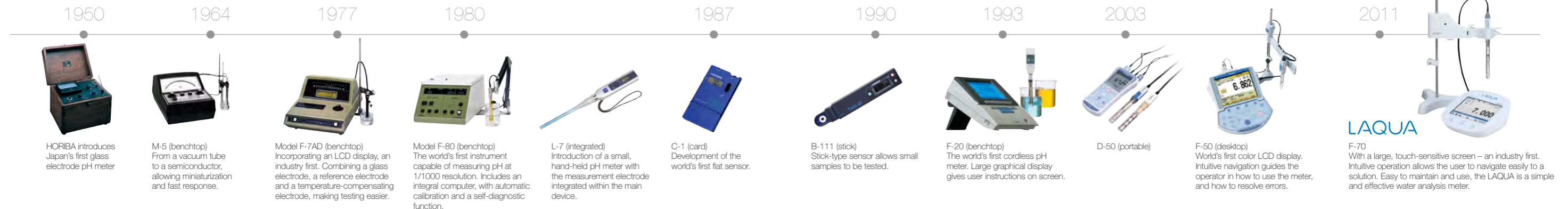
\*Figure shows B-712



\*Sample pretreatment is applied for Ca<sup>2+</sup> measurement to match the measurement condition with ion chromatography.



## HORIBA water quality analyzers - a history





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

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## IMS

HORIBA Group is operating Integrated Management System (IMS)  
 ISO9001 JQA-0298 / ISO14001 JQA-E-90039 / ISO13485  
 JQA-MD0010 / OHSAS18001 JQA-OH0068

