# HORIBA
## Scientific

**Compact Water Quality Meter**

**B-700 series**

**Debut!**

# LAQUAtwin

**IMS**
HORIBA Group is operating Integrated Management System

ISO9001 JQA-0298
ISO14001 JQA-E-90039
OHSAS18001 JQA-OH0068



**Actual Size**

CE
CE marking comliant

HORIBA celebrates its 60th anniversary in 2013
One past, One future, One HORIBA

pH  COND  Na⁺  K⁺  NO₃⁻  Ca²⁺  Salt

# Compact Water Quality Meter

## Debut!

# LAQUAtwin

**HORIBA's 60 years of sensor engineering realize accurate direct measurement from only a single drop on the unique flat sensor.**
**Select LAQUAtwin form seven electrochemistry parameters such as pH, conductivity, various ions ($Na^+$, $K^+$, $NO_3^-$, $Ca^{2+}$) and salt concentration that suits your purpose.**
**Bring simple, compact LAQUAtwin with you wherever and whenever you want to. It is your "lab-in-a-pocket.".**

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

### Variety!
Many different measurement methods can be made because of the sensor configuration.

### Anyone!
Easy, simple operation and indicators makes everyone an expert.

### Solution!
Discover more with easy, on-site measurement and only ion measurement

### Wherever!
IP67 rated waterproof. Carry LAQUAtwin and its accessories in a carrying case (included).
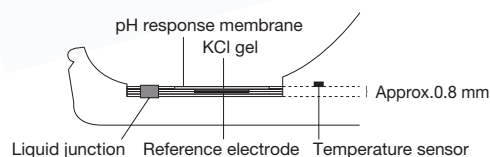
### Reliable!
HORIBA 60 years sensor technology distilled in HORIBA original flat sensor.

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

\* Comparison between a measurement in a container and a direct drop using LAQUAtwin.

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

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

pH response membrane
KCI gel
Approx.0.8 mm
Liquid junction    Reference electrode    Temperature sensor

● Sectional drawing of tip of Flat sensor.
\* Figure shows B-711/B-712/B-713 (pH)

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

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

### ■ Calibrate and measure at the touch of a button – the Smiley face 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 \* (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.

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

### ■ Carrying case comes standard for handy portability

The compact carrying case contains everything you need for your measurements, including the standard solution. Ready to measure only with carrying case, it's a your laboratory !
You can attach a strap or tag on the strap hole.

● Attach a strap or tag here.
\* Strap not included

## ■ Unique measurement variation by LAQUAtwin

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

LAQUA**twin**

### Drops
Drop a sample with a pipette, small volume 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 for example from a river. Vertically 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 drop on an amount of pure water.
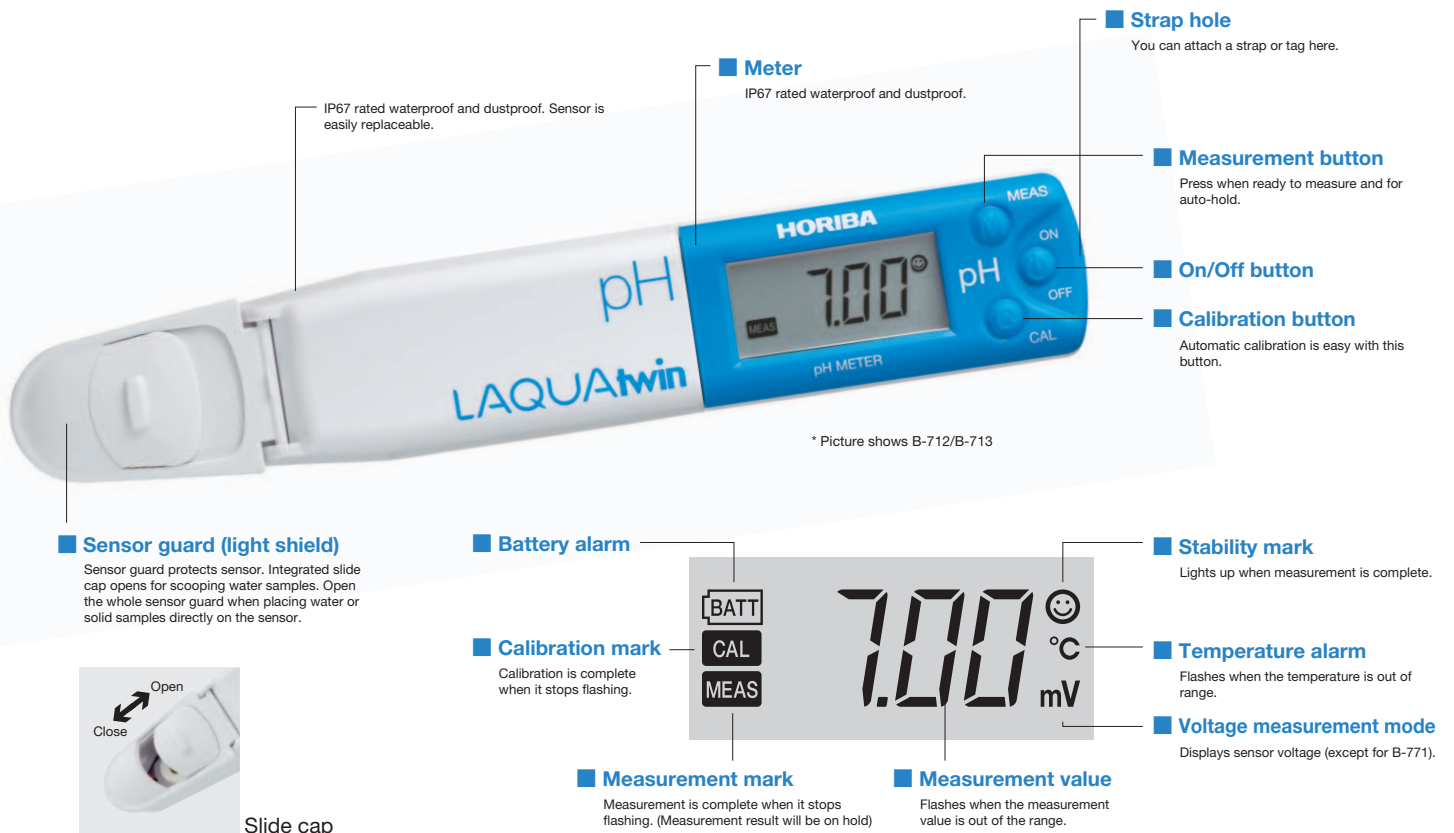
### Paper, textiles and films
To test sheets of paper and textiles, cut up the sample into small pieces and place them directly onto the sensor then drop on a define amount of pure water.

* All methods applicable to pH measurement   * B-771 (conductivity) cannot be tested in solids, powders, and sheet-like samples.
* These pictures are for image purpose

---

## ■ Easy measurement for all users

**Strap hole**
You can attach a strap or tag here.

**Meter**
IP67 rated waterproof and dustproof.

IP67 rated waterproof and dustproof. Sensor is easily replaceable.

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

**On/Off button**

**Calibration button**
Automatic calibration is easy with this button.

HORIBA
pH
7.00
pH
LAQUA**twin**
pH METER

* Picture shows B-712/B-713

**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.

Open
Close
Slide cap

**Battery alarm**

**Calibration mark**
Calibration is complete when it stops flashing.

BATT
CAL
MEAS
7.00 ☺ °C
mV

**Measurement mark**
Measurement is complete when it stops flashing. (Measurement result will be on hold)

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

**Stability mark**
Lights up when measurement is complete.

**Temperature alarm**
Flashes when the temperature is out of range.

**Voltage measurement mode**
Displays sensor voltage (except for B-771).

# Select LAQUAtwin from 7 parameters depending on your sample or application

*1 Measurement value may affected by other ions contained in the sample. Refer to the table below for details.
*2 A sample pretreatment may be needed for measurement for total Calcium concentration.

## pH Meter
### B-711/B-712/B-713 (US only)
**Feature**

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

**Applications include**

Fresh water testing (rain, rivers, lakes,); aquaria; drainage treatment solutions; soil testing; foods testing; research laboratories; QC of medical supplies and cosmetics;school education, etc.

## Conductivity (EC) Meter
### B-771
**Feature**

Conductivity reading converted into Salt concentration and TDS. Autoranging & temperature compensation feature allows accuracy on a measurements wide range.

**Applications include**

Fresh water testing (rain, rivers, lakes); aquaria; soil testing; salt water damage testing; surface cleanliness testing and improved paint adhesion.

## Sodium Ion Meter
### B-722
**Feature**

Unique compact meter for quick, on-site and reliable measurement of sodium ion using ion selective electrode (ISE).

**Applications include**

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

## Potassium Ion Meter
### B-731
**Feature**

Unique compact meter for quick, on-site and reliable measurement of potassium ion using ion selective electrode (ISE).

**Applications include**

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

## Nitrate Ion Meter
### B-743 (for general use)
**Feature**

Unique compact meter for quick, on-site and reliable measurement of nitrate ion. Special application kits for crop (B-741) and soil (B-742) are also available.

**Applications include**

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

## Calcium Ion Meter
### B-751
**Feature**

Unique compact meter for quick, on-site and reliable measurement of ionized calcium using ion selective electrode (ISE).

**Applications include**

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

## Salt Meter
### B-721
**Feature**

Unique compact meter using a sodium ion electrode to measure salt content (NaCl) when conventional meters generally convert the conductivity value.
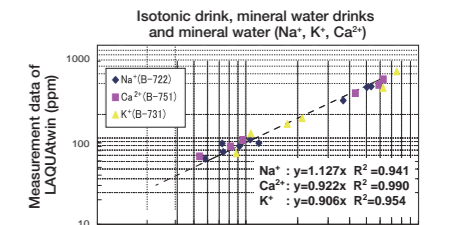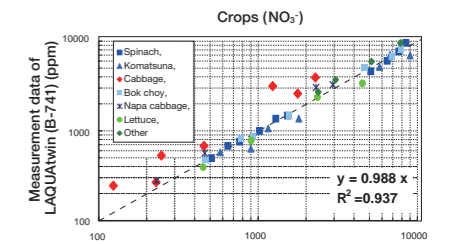
**Applications include**

health management; food quality control; Dietary instruction

## Examples for Ion measurement

The graph below depicts the correlation between LAQUAtwin and ion chromatography.



Isotonic drink, mineral water drinks and mineral water (Na⁺, K⁺, Ca²⁺)

$Na^+$ : $y=1.127x$ $R^2=0.941$
$Ca^{2+}$: $y=0.922x$ $R^2=0.990$
$K^+$ : $y=0.906x$ $R^2=0.954$

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



Crops (NO₃⁻)

$y = 0.988 x$
$R^2 = 0.937$

## Interfering ion influence

| | Sodium Ion (Na⁺) | Potassium Ion (K⁺) | Nitrate Ion (NO₃⁻) | Calcium Ion (Ca²⁺) |
|---|---|---|---|---|
| Selectivity coefficient | $K^+$, $Rb^+= 1 \times 10^{-2}$ $Ba^{2+}$, $Sr^{2+}$, $Ca^{2+}$, $Mg^{2+}= 1 \times 10^{-4}$ $Li^+= 1 \times 10^{-3}$ $Cs^+= 3 \times 10^{-3}$ $NH_4^+= 6 \times 10^{-3}$ | $Rb^+= 1 \times 10^{-1}$ $Mg^{2+}= 1 \times 10^{-5}$ $NH_4^+= 7 \times 10^{-3}$ $Ca^{2+}= 7 \times 10^{-7}$ $Cs^+= 4 \times 10^{-3}$ $Na^+= 3 \times 10^{-4}$ | $I^-= 10$ $Cl^-= 4 \times 10^{-2}$ $Br^-= 9 \times 10^{-1}$ $ClO_4^-= 3 \times 10^{-3}$ $NO_2^-= 7 \times 10^{-1}$ | $Na^+$, $K^+$, $Mg^{2+}= 1 \times 10^{-3}$ $Fe^{2+}$, $Zn^{2+}= 1$ $Fe^{3+}= 10$ $Cu^{2+}= 1 \times 10^{-2}$ |
| 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 $1\times10^{-2}$, which means for the same concentration of potassium ion and sodium ion coexisting in a sample, the sodium measurement shows approximately $1\times10^{-2}$(1%) higher result.

## Main specification table

| | | pH | Conductivity (EC) | Sodium Ion (Na⁺) | Potassium Ion (K⁺) | Nitrate Ion (NO₃⁻) | Calcium Ion (Ca²⁺) | Salt (NaCl) |
|---|---|---|---|---|---|---|---|---|
| Model | B-711 | B-712/B-713*1 | B-771 | B-722 | B-731 | B-743*2 (for general use) | B-751 | B-721 |
| Measurement principle | Glass electrode method | | 2 AC bipolar | Ion electrode method | | | | |
| Minimum sample volume | 0.05 mL*3, 0.1 mL or more | | 0.12 mL or more | 0.05 mL*3, 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 9900 ppm | 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*4 | $NO_3^-$: 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) | 0.1 to 10% by weight |
| Display range*5 | 0 to 14 pH | | 0 to 199 mS/cm (0 to 19.9 S/m) | 0 to 9900 ppm (mg/L) | | | 0 to 9900 ppm (mg/L) | 0.00 to 25% by weight |
| Range and Resolution (Valid numbers) | 0.1 pH | 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 | | | | 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*6 | Two-point*6 | Two-point*6 | | | | |
| Accuracy*7 | ±0.1 pH | | ±2% F.S. ±1digit (for each range)*8 | ±10% of reading value | | | ±20% of reading value | ±10% of reading value |
| Functions | Temperature compensation • IP67 Water/Dust proof*9 • Auto hold • Automatic power off (30 minutes) | | Salt/TDS Measurement • Auto range change • Temperature conversion (2%/℃ fixed) • IP67 Water/Dust proof*9 • Auto hold • Automatic power off (15 minutes) | Auto range change • Temperature compensation • IP67 Water/Dust proof*9 • Auto hold • Automatic power off (30 minutes) | | | | |
| Display | Custom (monochrome) Digital LCD | | | | | | | |
| Operating temperature/ humidity | 5 to 40℃, 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 | 164 mm × 29 mm × 20 mm (excluding projections)/Approx. 50 g (meter only, without batteries, B-771 approx. 45 g) | | | | | | | |
| Accessories included | Standard solution (pH 7) (14 mL), 5 pieces of Sampling sheet B | Standard solution (pH 4 & pH 7*10) (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) (14 mL), 5 pieces of Sampling sheet B | Standard solution (150 ppm & 2000 ppm) (14 mL), 5 pieces of Sampling sheet B | 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 |

Note: "2 CR2032 batteries/1 Pipette/Instruction manual/Quick manual/Storage case" appears above Accessories included row.

*1 For US market only.
*2 Special application packages for crop measurement (B-741) and soil measurement (B-742) are also available.
*3 Smaller amount (0.05 mL or more) can be measured with the sampling sheet B. (Please close the light shield cover. If a sample that contain particulate, please use "Sampling sheet holder" (sold separately))
*4 With soil/water sampling ratio of 1:5.
*5 When the measured value is out of the measurement range, the displayed value blinks. It should be used only as a guide.
*6 Selectable between one-point and two-point calibrations. High conductivity standard solution (12.9 mS/cm) is sold separately.
*7 Repeatability in measurement of a standard solution after calibration using it.
*8 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)
*9 IP67: no failure when immersed in water at a depth of 1 meter for 30 minutes. But the product can not be used underwater.
*10 B-712: pH 6.86/B-713: pH 7.00 for US market.

## Nitrate Ion Meter for crop B-741



■Measurement range: 100～9,900 ppm (NO₃⁻), 23～2,200 ppm (NO₃⁻-N)

[Accessories included]
Standard solution for crops(300 ppm & 5000 ppm) (14 mL), 2 CR2032 batteries/Instruction manual/5 Pipettes, Cleaning solution bottle (250 mL), Crop sample press, 3 Medical cups, Quick manual, Carrying case

## Nitrate Ion Meter for soil B-742



■Measurement range: 30～600 ppm (NO₃⁻), 6.8～140 ppm (NO₃⁻-N), 3.4～68 kg/10a (NO₃⁻-N)

[Accessories included]
Standard solution for soil (30 ppm, 300 ppm) (14 mL), 2 CR2032 batteries,Instruction manual/5 Pipettes, Cleaning solution bottle（250 mL）, 3 Extraction bottles (100 mL), 2 sets of spoon for soil sampling, Tweezers, Sampling sheetB, 2 Sampling sheet holders, Quick manual, Carrying case

## ■ List of Standard solution/Sensor/Accessories

LAQUAtwin

### Standard solution

| Part Number | Model | Name | Description | Applicable model |
|---|---|---|---|---|
| 3200457725 | Y017 | Standard solution (pH 6.86) | pH 6.86  14 mL 6 bottles | B-711, B-712 |
| 3200457726 | Y014 | Standard solution (pH 4.01) | pH 4.01  14 mL 6 bottles | B-712, B-713 |
| 3200457721 | Y021H | Standard solution (NaCl 5.0%) | NaCl 5.0%  14 mL 6 bottles | B-721 |
| 3200457722 | Y021L | Standard solution (NaCl 0.5%) | NaCl 0.5%  14 mL 6 bottles | B-721 |
| 3200457723 | Y022H | Standard solution (Sodium Ion 2000 ppm) | Sodium Ion 2000 ppm  14 mL 6 bottles | B-722 |
| 3200457724 | Y022L | Standard solution (Sodium Ion 150 ppm) | Sodium Ion 150 ppm    14 mL 6 bottles | B-722 |
| 3200457719 | Y031H | Standard solution (Potassium Ion 2000 ppm) | Potassium Ion 2000 ppm  14 mL 6 bottles | B-731 |
| 3200457720 | Y031L | Standard solution (Potassium Ion 150 ppm) | Potassium Ion 150 ppm    14 mL 6 bottles | B-731 |
| 3200053433 | Y041 | Standard solution (Nitrate Ion 5000 ppm) | Nitrate Ion 5000 ppm  14 mL 6 bottles | B-741 |
| 3200053514 | Y042 | Standard solution (Nitrate Ion 300 ppm) | Nitrate Ion 300 ppm    14 mL 6 bottles | B-741, B-742 |
| 3200053532 | Y043 | Standard solution (Nitrate Ion 2000 ppm) | Nitrate Ion 2000 ppm  14 mL 6 bottles | B-743 |
| 3200053535 | Y044 | Standard solution (Nitrate Ion 30 ppm) | Nitrate Ion 30 ppm      14 mL 6 bottles | B-742 |
| 3200053536 | Y045 | Standard solution (Nitrate Ion 150 ppm) | Nitrate Ion 150 ppm    14 mL 6 bottles | B-743 |
| 3200457727 | Y051H | Standard solution (Calcium Ion 2000 ppm) | Calcium Ion 2000 ppm  14 mL 6 bottles | B-751 |
| 3200457728 | Y051L | Standard solution (Calcium Ion 150 ppm) | Calcium Ion 150 ppm    14 mL 6 bottles | B-751 |
| 3200457718 | Y071H | Standard solution (Conductivity 12.9 mS/cm) | Conductivity 12.9 mS/cm  14 mL 6 bottles | B-771 |
| 3200457717 | Y071L | Standard solution (Conductivity 1.41 mS/cm) | Conductivity 1.41 mS/cm  14 mL 6 bottles | B-771 |

### Sensor

| Part Number | Model | Name | Description | Applicable model |
|---|---|---|---|---|
| 3200459834 | S010 | pH Sensor | Replacement sensor | B-711, B-712, B-713 |
| 3200459866 | S021 | Salt Sensor | Replacement sensor | B-721 |
| 3200459867 | S022 | Sodium Ion Sensor | Replacement sensor | B-722 |
| 3200459868 | S030 | Potassium Ion Sensor | Replacement sensor | B-731 |
| 3200459870 | S040 | Nitrate Ion Sensor | Replacement sensor | B-741, B-742, B-743 |
| 3200459869 | S050 | Calcium Ion Sensor | Replacement sensor | B-751 |
| 3200459672 | S070 | Conductivity  Sensor | Replacement sensor | B-771 |

### Accessories

| Part Number | Model | Name | Description | Applicable model |
|---|---|---|---|---|
| 3200053858 | Y046 | Sampling sheet B | 100 pecies | Except B-771 |
| 3200459736 | Y048 | Sampling sheet holder ( for LAQUAtwin) | | Except B-771 |

## WEB  HORIBA Water Quality Analyzers

### Compact Water Quality Meter

LAQUAtwin

http://www.horiba.com/laquatwin

### Benchtop pH/Water Quality Analyzer

LAQUA

http://www.horiba.com/laqua

### WATER QUALITY ANALYZERS

http://www.horiba.com/wq