

# HORIBA

Explore the future

## Water Quality Monitoring System

## U-20XD Series



CE marking compliant



1 month  
continuous  
monitoring

Depth up to  
100 meters

GPS  
function

13  
simultaneous  
parameters

Visit Our Web Site at

<http://www.horiba-water.com>

# The U-20XD Series: Same Innovative features, now with Xtra Durable design

- Heavy-duty stainless steel protective cover
- Pelican® carrying case standard (U-22XD Only)
- Rubber-made sensor guard to protect sensors and prevent contamination

Water is as precious as life itself. That's why current threats to water supplies make water quality analysis vital to our very existence. HORIBA has created the Multi-function Water Quality Monitoring System. Years of HORIBA sensor technology development have reached their culmination in the form of a 47-mm diameter sensor probe: a compact monitoring solution offering high pressure tolerance, long-term continuous measurement capability and highly accurate, simultaneous analysis of 13 parameters. In addition to the Water Quality Monitoring System's own capabilities, it was designed by HORIBA to be compatible with GPS and other data processing techniques.

## One-touch calibration makes work easy

Just submerge the probe into the calibration beaker filled with standard solution and press the button for simultaneous one-point calibration. The system also enables two-point calibration where high-precision measurement data is required.

- **Press a button**  
One point calibration for all 5 parameters (pH, Conductivity, Turbidity, DO, Depth) at once with pH4 solution.
- **Press another button**  
One point calibration for all 3 Ion parameters (Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, Ca<sup>2+</sup> only) at once with Ion one-point calibration solution.



▲ Control Unit

▶ Multi-Probe

## Six sensors, including Turbidity in Two-inches probe



— Turbidity sensor

Fits in a  
2-inch well

## Dry cell battery operated meter

You don't have to worry about charging the battery. Just buy a common dry cell battery at a store.

**Pelican® carrying case standard for the U-22XD SET**

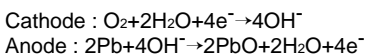


**World's First! HORIBA's high-precision dissolved oxygen sensor** (Patented)

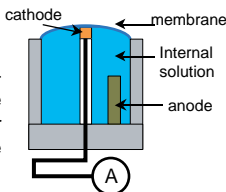
With its membrane galvanic cell, the HORIBA dissolved oxygen sensor is virtually impervious to eddies and flows in the solution. Highly precise measurements can now be obtained with an ease.

**HORIBA DO Sensor needs no stirring, quick response**

● Diaphragm Galvanic Battery Method



Larger the cathode surface is, more it is influenced by the eddies and flows of samples. The cathode of the new DO sensor is 1/45 smaller than the old type, obtained 95% influence free from the water flow!!



● Response efficiency

| Response from Air to Zero-gas | U-20   |
|-------------------------------|--------|
| T90                           | 30 sec |
| T95                           | 55 sec |

Polarographic method may have slower response.

● Membrane replacement

Membrane of DO sensor can be replaced by the membrane replacement kit.

**Up to one month**

**Data logging**

The sensor's built-in memory function enables continuous measurement for as long as one month\* — just by leaving the probe submerged in the sample. Personnel need not be present during the measurement process — the data can even be captured by personal computers in remote locations.

\*With measurements every 15 minutes.

**Simultaneous measurement of**

**13 parameters**

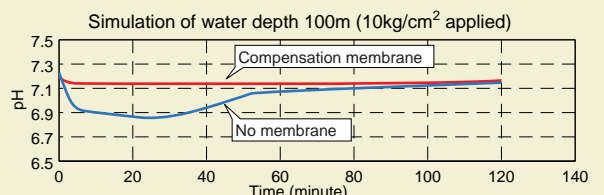
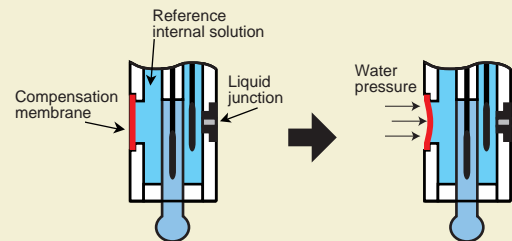
With the W-23XD unit (only), simultaneous measurements of up to 13 parameters (from pH, dissolved oxygen, and conductivity to seawater specific gravity and a variety of ions) can be obtained — much more quickly and easily than with conventional instruments. With its powerful measurement capabilities, the compact U-20XD series is recommended for all water quality researchers and professionals.

**Measurement at depths as low as**

**100 meters**

With its superior durability and high pressure resistance, the newly developed sensor facilitates measurements as far as 100 meters below the water surface. Thus, in addition to rivers, lakes and other shallow bodies, high-precision measurement can now be readily obtained — and water quality can be monitored — at dams, and even in the open sea.

**Pressure compensation membrane**





The computer does not need to be at the measurement location!

System enables

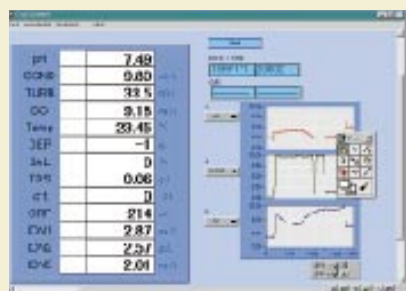
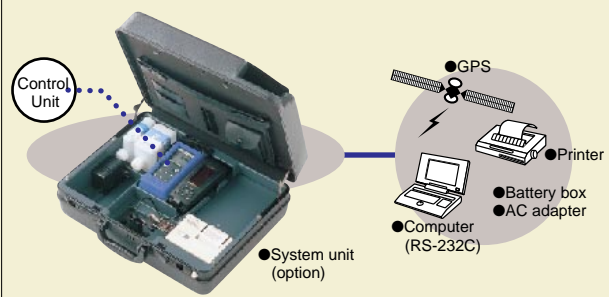
**GPS**

and numerous other data processing mechanisms

System capabilities can be greatly increased by installing the Global Positioning System (GPS), supplied with unit U-2002. GPS allows measurement of location and time, in addition to water quality, and enables main unit screen display of the obtained data — an indispensable function for maintaining detailed records. With the acquired longitude, latitude and depth data, subject locations can be mapped in 3-D.

GPS functions by processing satellite signals to provide position measurement with pinpoint accuracy. It is widely employed in air and sea navigation, as well as car navigation systems.

The system unit alone is compatible with many I/O interfaces.



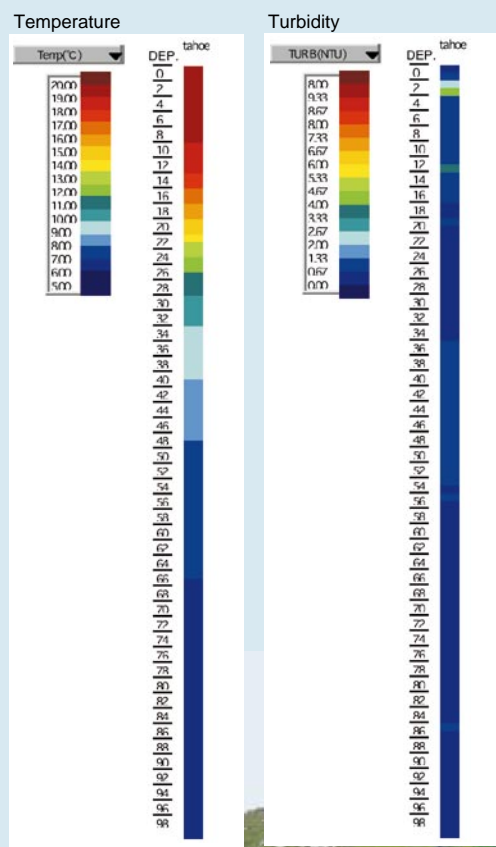
▲Example of typical measurement screen



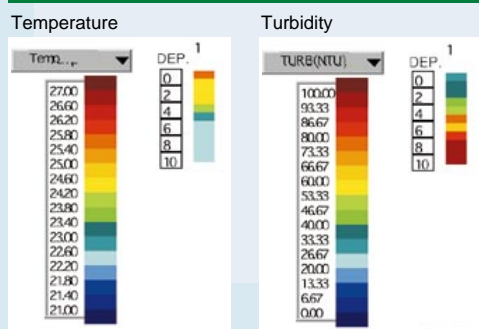
▲Example showing GPS and mapping software application (GPS MAP'N TRACK made by MAGELLAN SYSTEM CORPORATION is used for mapping software.)

# WATER QUALITY DATA

## U.S.A. : Lake Tahoe



## Argentine : Los Chorrillos River

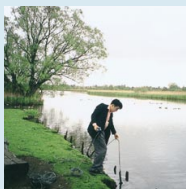
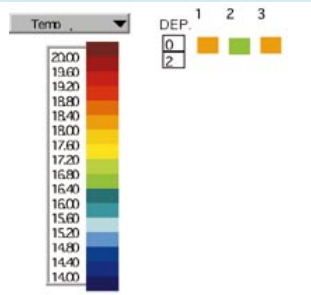


This product has been developed in cooperation with the International Lake Environment Committee (ILEC)

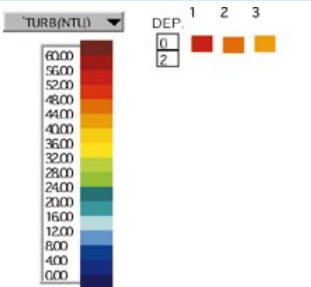
<http://www.ilec.or.jp>

## Denmark : Lading Marsh

Temperature

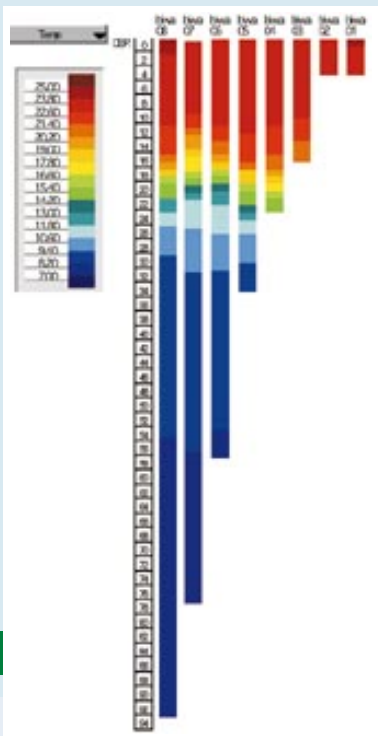


Turbidity

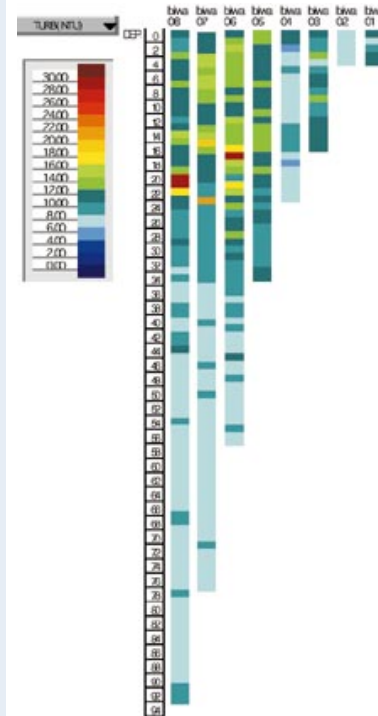


## Japan : Lake Biwa

Temperature



Turbidity



## U-20 series applications



● Oceans and seas



● City sewage water



● Lakes and marshes



● Factory drainage



● Dams



● Farm water



● Wells and ground water



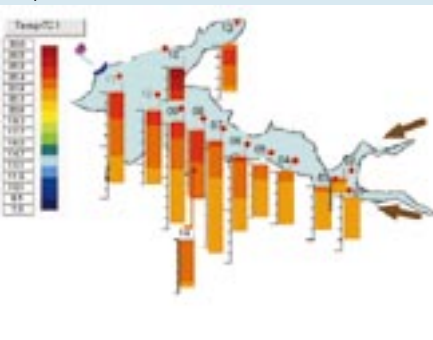
● Nurseries

Tom Van Sant-GeoSphere/  
Science Photo Library-PPS.

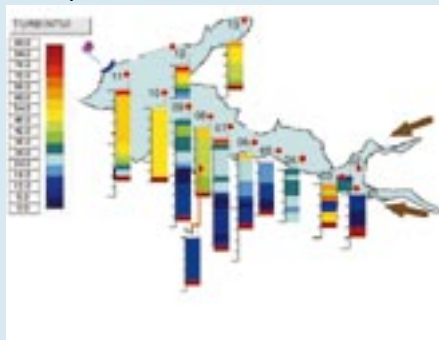


## Zimbabwe : Lake Chivero

Temperature



Turbidity



# U-22XD SET

Cable not detachable



Pelican® carrying case as a standard case

Sensor probe with built-in sensors (depth, conductivity, temperature, turbidity)

### Packing List

- Main unit
- Sensor probe with the cable (2m, 10m, 30m). Type of cable length is selected depending on applications
- Sensor ● pH4 standard solution (250 ml)
- pH internal solution (250 ml) ● Syringe (with needle)
- Sensor spanner ● Calibration beaker ● Grip holder
- Carrying case ● Dry cell 6F22 (S006P) (1 piece)
- Dry cells (R03) (3 pieces) ● Operation manual
- Consumables

### U-22XD SET measurement parameters

| Maximum probe size                  | 47mm |
|-------------------------------------|------|
| pH                                  | ●    |
| Dissolved oxygen                    | ●    |
| Conductivity                        | ●    |
| Salinity                            | ●    |
| Total dissolved solids (TDS)        | ●    |
| Seawater specific gravity           | ●    |
| Temperature                         | ●    |
| Turbidity                           | ●    |
| Depth                               | ●    |
| Oxidation reduction potential (ORP) | ●    |
| Data logging                        | ●    |

# U-20XD series

Cable detachable

Application requiring various cable lengths, measurement at multiple points, or connecting the probe with your tool, select necessary parts from the following table.

### Control Unit



W-2000 Control Unit, Grip holder, Batteries

### Multi-Probe

Sensor probe with built-in sensors (depth, conductivity, temperature, turbidity)



W-22XD

Packing List

pH4 standard solution, Reference solution, Calibration beaker, Batteries, Instruction manual, Consumables

W-23XD

Packing List

pH4 standard solution, Reference solution, Ion auto-cal solution, Calibration beaker, Batteries, Instruction manual, Consumables

### Cables



- W-002C 2m
- W-010C 10m
- W-030C 30m
- W-100C 100m

### U-20XD series measurement parameters

|                                     | W-22XD    | W-23XD    |
|-------------------------------------|-----------|-----------|
| Maximum probe size                  | 47mm      | 97mm      |
| pH                                  | (●)option | (●)option |
| Dissolved oxygen                    | (●)option | (●)option |
| Conductivity                        | ●         | ●         |
| Salinity                            | ●         | ●         |
| Total dissolved solids (TDS)        | ●         | ●         |
| Seawater specific gravity           | ●         | ●         |
| Temperature                         | ●         | ●         |
| Turbidity                           | ●         | ●         |
| Depth                               | ●         | ●         |
| Oxidation reduction potential (ORP) | (●)option | (●)option |
| Data logging                        | ●         | ●         |
| 100m depth mess.                    |           | ●         |
| Nitrate ion*                        |           | (●)option |
| Calcium ion*                        |           | (●)option |
| Chloride ion*                       |           | (●)option |
| Fluoride ion*                       |           | (●)option |
| Potassium ion*                      |           | (●)option |
| Ammonia*                            |           | (●)option |

\*Optional sensor (replacement with other ion sensors is possible).

### ● Sensors

| Sensors       | Internal Solution     | Cartridge              | Membrane Replacement Kit          |
|---------------|-----------------------|------------------------|-----------------------------------|
| pH            | #330 (P/N:9037005200) | -                      | -                                 |
| pH/ORP        | #330 (P/N:9037005200) | -                      | -                                 |
| DO            | -                     | -                      | Approx. 50 uses (P/N:9037007400)* |
| Nitrate Ion   | #302 (P/N:9037006600) | #7681 (P/N:9003015200) | -                                 |
| Chloride Ion  | #301 (P/N:9037006700) | #7660 (P/N:9003015000) | -                                 |
| Calcium Ion   | #300 (P/N:9003003200) | #7683 (P/N:9003015400) | -                                 |
| Fluoride Ion  | #300 (P/N:9003003200) | #7682 (P/N:9003015300) | -                                 |
| Potassium Ion | #303 (P/N:9037006900) | #7661 (P/N:9003015100) | -                                 |
| Ammonia       | #370 (P/N:9012000900) | -                      | Approx. 6 uses (P/N:9037007000)   |

\*includes internal solution

### ● Standards and calibration solutions

|                                    |                          |
|------------------------------------|--------------------------|
| pH4                                | #100-4 (P/N:9003001600)  |
| pH7                                | #100-7 (P/N:9003001700)  |
| pH9                                | #100-9 (P/N:9003001800)  |
| ORP (89mV at 25°C)                 | #160-51 (P/N:9003003100) |
| ORP (258mV at 25°C)                | #160-22 (P/N:9003003000) |
| Ion one-point calibration solution | #130 (P/N:9037005200)    |

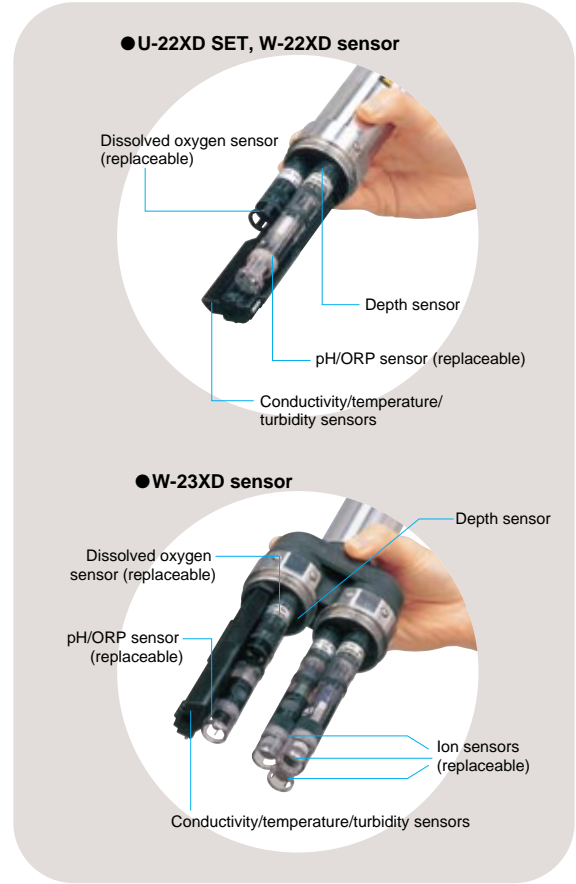
# U-20XD series specifications

|   |                                 |   | U-22XD SET  | W-22XD | W-23XD |  |
|---|---------------------------------|---|---|--------|--------|--|
| <b>Control Unit</b>   | Water proof construction        | IP-67   | ●   | ●      | ●      |  |
| <b>Multi-Probe *1</b>   | Measurement temperature         | 0-55°C  |   | Option | Option |  |
|   | Storage temperature             | -5-60°C   |   |        |        |  |
|   | Measurement depth *2            | to 100 m  |   |        |        |  |
|   | Maximum probe size              | 95 mm   | ●   | ●      | ●      |  |
|   | Probe length                    | 430 mm  | (to 30 m)   |        |        |  |
|   | Continuous use *3               | 30days  |   |        |        |  |
|   | Data logging                    | ○   |   |        |        |  |
|   | Manual data memory (2880 items) | ○   |   |        |        |  |
|   | Automatic calibration           | ○   |   |        |        |  |
| <b>pH</b><br>● Two-point calibration<br>● Automatic temperature compensation                                  | Measurement Principle           | Glass electrode method                          |   |        |        |  |
|   | Range                           | pH 0-14   |   |        |        |  |
|   | Resolution                      | 0.01 pH   | ●   | Option | Option |  |
|   | Repeatability                   | ±0.05 pH  |   |        |        |  |
|   | Accuracy                        | ±0.1 pH   |   |        |        |  |
| <b>Dissolved oxygen</b><br>● Salt correction (0 to 40 ppt /automatic)<br>● Automatic temperature compensation | Measurement Principle           | Diaphragm galvanic battery method               |   |        |        |  |
|   | Range                           | 0-19.99 mg/L                                    |   |        |        |  |
|   | Resolution                      | 0.01 mg/L                                       | ●   | Option | Option |  |
|   | Repeatability                   | ±0.1 mg/L                                       |   |        |        |  |
|   | Accuracy                        | ±0.2 mg/L                                       |   |        |        |  |
| <b>Conductivity</b><br>● Auto range<br>● Automatic temperature conversion (25°C)<br>● SI units                | Measurement Principle           | 4 AC electrode method                           |   |        |        |  |
|   | Range                           | 0-9.99 S/m                                      |   |        |        |  |
|   | Resolution                      | 0.1%F.S   | ●   | ●      | ●      |  |
|   | Repeatability                   | ±1%   |   |        |        |  |
|   | Accuracy                        | ±3%   |   |        |        |  |
| <b>Salinity</b>   | Measurement Principle           | Conductivity conversion                         |   |        |        |  |
|   | Range                           | 0-4%  |   |        |        |  |
|   | Resolution                      | 0.01%   | ●   | ●      | ●      |  |
|   | Repeatability                   | ±0.1%   |   |        |        |  |
|   | Accuracy                        | ±0.3%   |   |        |        |  |
| <b>Total Dissolved Solids (TDS)</b><br>● Conversion factor setting  | Measurement Principle           | Conductivity conversion                         |   |        |        |  |
|   | Range                           | 0-100 g/L                                       |   |        |        |  |
|   | Resolution                      | 0.1%F.S   | ●   | ●      | ●      |  |
|   | Repeatability                   | ±2 g/L  |   |        |        |  |
|   | Accuracy                        | ±5 g/L  |   |        |        |  |
| <b>Seawater specific gravity</b><br>● Display σ <sub>t</sub> , σ <sub>0</sub> , σ <sub>15</sub>               | Measurement Principle           | Conductivity conversion                         |   |        |        |  |
|   | Range                           | 0-50 σ <sub>t</sub>                             |   |        |        |  |
|   | Resolution                      | 0.1 σ <sub>t</sub>                              | ●   | ●      | ●      |  |
|   | Repeatability                   | ±2 σ <sub>t</sub>                               |   |        |        |  |
|   | Accuracy                        | ±5 σ <sub>t</sub>                               |   |        |        |  |
| <b>Temperature</b>  | Measurement Principle           | Thermistor method                               |   |        |        |  |
|   | Range                           | 0-55°C  |   |        |        |  |
|   | Resolution                      | 0.01°C  | ●   | ●      | ●      |  |
|   | Repeatability                   | ±0.3°C  |   |        |        |  |
|   | Accuracy                        | ±1.0°C  |   |        |        |  |
| <b>Turbidity</b><br>● Unit selection  | Measurement Principle           | Penetration and scattering method               |   |        |        |  |
|   | Range                           | 0-800 NTU                                       |   |        |        |  |
|   | Resolution                      | 0.1 NTU   | ●   | ●      | ●      |  |
|   | Repeatability                   | ±3%   |   |        |        |  |
|   | Accuracy                        | ±5%   |   |        |        |  |
| <b>Water depth</b>  | Measurement Principle           | Pressure method                                 |   |        |        |  |
|   | Range(NTU or mg/L)              | 0-100m  |   |        |        |  |
|   | Resolution                      | 0.1 m   | ●   | ●      | ●      |  |
|   | Repeatability                   | ±3%   |   |        |        |  |
|   | Accuracy                        | ±5%   |   |        |        |  |
| <b>Oxidation reduction potential(ORP)</b>   | Measurement Principle           | Platinum electrode method                       |   |        |        |  |
|   | Range                           | ±1999 mV  |   |        |        |  |
|   | Resolution                      | 1 mV  | ●   | Option | Option |  |
|   | Repeatability                   | ±5 mV   |   |        |        |  |
|   | Accuracy                        | ±15 mV  |   |        |        |  |
| <b>Ion</b><br>● Auto range  | Measurement Principle           | Ion electrode method                            |   |        |        |  |
|   | Resolution                      | 0.1% F.S  |   |        | Option |  |
|   | Repeatability                   | ±5%   |   |        | Option |  |
|   | Accuracy                        | ±10%  |   |        | Option |  |
|   | Range                           | Nitric acid ion                                 | NO <sub>3</sub> <sup>-</sup> : 0.62-62,000 mg/L(pH 3-7) |        |        |  |
|   |                                 | Chloride ion                                    | Cl <sup>-</sup> : 0.4-35,000 mg/L(pH 3-11)              |        |        |  |
|   |                                 | Calcium ion                                     | Ca <sup>2+</sup> : 0.4-40,080 mg/L(pH 5-11)             |        |        |  |
|   |                                 | Fluoride ion                                    | F <sup>-</sup> : 0.02-19,000 mg/L(pH4-10:20 mg/L)       |        |        |  |
|   |                                 | Potassium ion                                   | K <sup>+</sup> : 0.04-39,000 mg/L(pH5-11:3.9 mg/L)      |        |        |  |
|   | Ammonia                         | NH <sub>3</sub> : 0.1-1,000 mg/L(pH 12 or more) |   |        |        |  |
| Simultaneously measurable parameters  |                                 |   | 10  | 10     | 13     |  |

Note: The accuracy rating value is obtained from measurements at an intermediate point of the standard solution after two-point calibration (at room temperature and pressure).  
 The repeatability and accuracy rating percentages are based on the full scale (except for salinity).  
 \*1: Organic solvents, strong acids, and strong alkaline solvents cannot be measured.  
 \*2: The maximum depth for ion measurements are 100 m for nitric acid ion, chloride ion, fluoride ion, 15 m for calcium ion, ammonia, and 3 m for potassium ion.  
 \*3: Based on the data measured automatically at 15 minutes intervals. The battery life taken into account.  
 Periodical maintenance and calibration is necessary when a lot of shellfishes and seaweeds exist at the measurement point.

● Influence of Hindering Ions. The values show permissible coexistence limits

|               |  |
|---------------|--|
| Nitrate ion   | ClO <sub>4</sub> =0.03 I <sup>-</sup> =0.1 Br <sup>-</sup> =2 NO <sub>2</sub> =3 Cl <sup>-</sup> =40 F <sup>-</sup> =200 CH <sub>3</sub> COO <sup>-</sup> =300 SO <sub>4</sub> <sup>2-</sup> = more than 1000  |
| Chloride ion  | S <sub>2</sub> O <sub>3</sub> <sup>2-</sup> , S <sup>2-</sup> , I <sup>-</sup> , Ag <sup>+</sup> , Hg <sup>2+</sup> =Not possible SCN <sup>-</sup> =0.3 MnO <sup>+</sup> =0.1 Br <sup>-</sup> =0.03  |
| Calcium ion   | Fe <sup>3+</sup> =0.1 Fe <sup>2+</sup> , Zn <sup>2+</sup> =1 Sr <sup>2+</sup> =50 Ni <sup>2+</sup> , Cu <sup>2+</sup> =70 Co <sup>2+</sup> =350 Mn <sup>2+</sup> =500 Mg <sup>2+</sup> =1,000 Na <sup>+</sup> , K <sup>+</sup> , Ba <sup>2+</sup> , NH <sub>4</sub> <sup>+</sup> =more than 1000 |
| Fluoride ion  | OH <sup>-</sup> =10, All negative ions except for OH <sup>-</sup> is permissible   |
| Potassium ion | Rb <sup>+</sup> =0.4 Cs <sup>+</sup> =3 NH <sub>4</sub> <sup>+</sup> =70 Li <sup>+</sup> , Na <sup>+</sup> , Mg <sup>2+</sup> , Ca <sup>2+</sup> , Sr <sup>2+</sup> , Ba <sup>2+</sup> =more than 1000   |
| Ammonia       | —  |



## Option

■ **System unit**  
Model U-2002 (with GPS, printer, and sample software)

■ **Carrying Case**  
Model U-2002 (for cable length less than 10m), Model W-2030 (for cable length more than 30m)

Please specify the printer voltage: 100, 110, 220V

Please select appropriate carrying case depending on your cable length.  
 \*Multi-probe guard or Flow Through Cell can only be stored in W-2030

■ **Extension Unit**  
Model U-2001

■ **Multi-probe Guard**  
Model W-2200

■ **Flow Through Cell**  
Model W-2100

Attaching the extension adapter to the main unit enables connection of an AC adapter, analog output, and RS-232C interface.

Applicable only for U-22XD set and W-22XD.  
 \*Multi-Probe not included

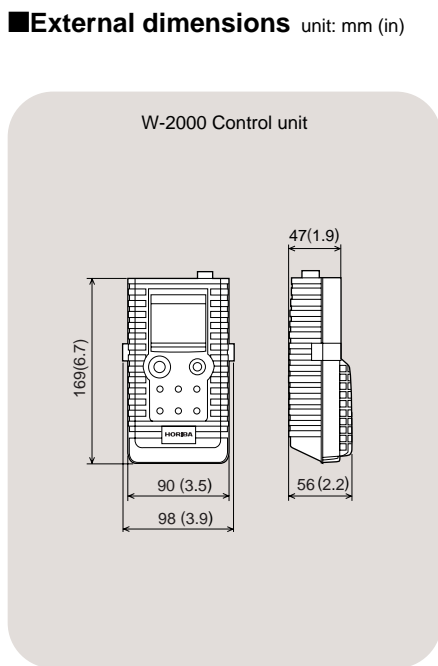
■ **AC adapter**  
Model AC-10

■ **Communication Cable**  
Model RS-232C

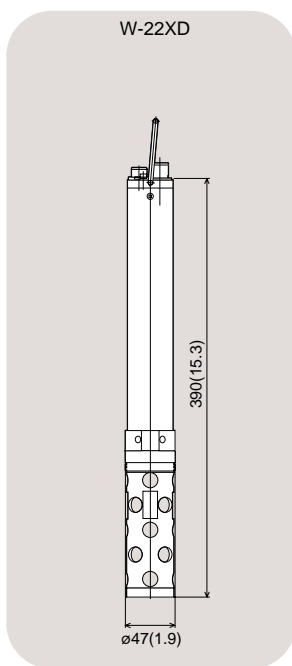
Connection to the extension adapter or system unit is required. Please specify the voltage: 100, 110, 220V

For RS-232C communication. U-2001 or U-2002 is necessary.

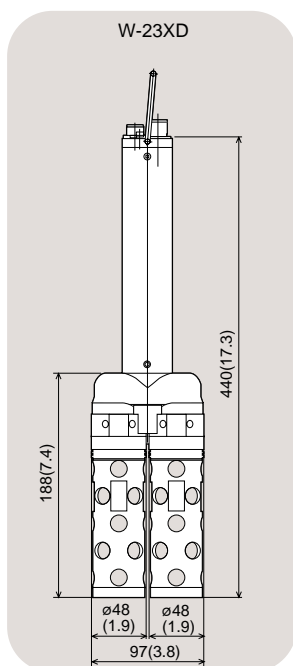
■External dimensions unit: mm (in)



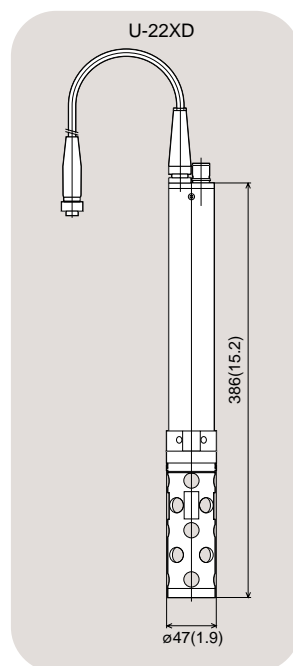
Weight: approx 500 g



Weight: approx 1300 g



Weight: approx 1800 g



Weight: approx 1400 g (2m cable)  
approx 1900 g (10m cable)

### Customer Registration System

Register as a Horiba meter user to receive periodical information such as FAQ, Software upgrade, Technical documents and lot others.



Horiba continues contributing to the preservation of the global environment through analysis and measuring technology.



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

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# HORIBA

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