

# AQUAREAD AP-Series Multi-Parameter Water Quality Monitoring System

## Excellent Functionality, Operability and Stability

### Built in GPS feature

Integrated GPS receiver in handheld Aquameter as standard

### Multi-parameter probe

Measure and display up to 17 parameters simultaneously within a single IP68 probe constructed of marine grade aluminium

### Compatible with various water monitoring applications

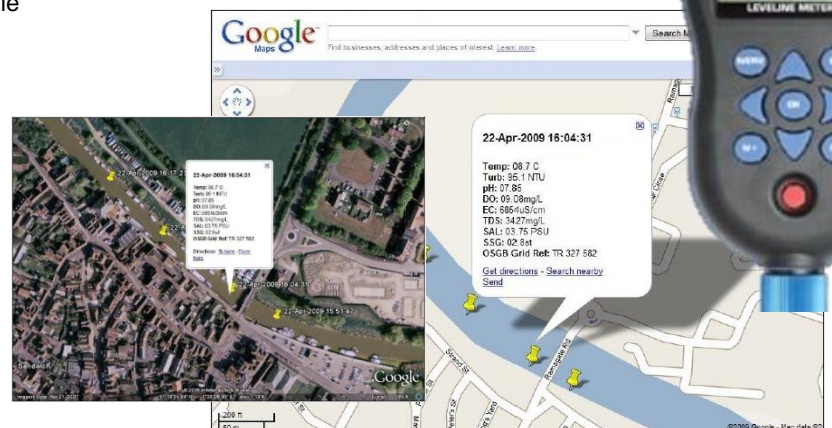
Suitable for both short term and long term monitoring in applications such as sea water, river water, dams, well water, ground water, city water, storm water run-off, lakes, ponds, and fish farms.

### Optical Dissolved Oxygen Sensor as standard

Probes comes standard with optical DO technology that offer significant advantages

### Datalogging and Software

Logging capacity up to 60,000 with the Aquameter. Data download via USB interface with supplied Software. Software provided enables user to view recorded data, save, archive and export of data. Exported data can be reported as excel file or as google file for viewing in Google earth and Google Maps.



GPS feature with Google earth/maps

## Available Parameters

- Standard Parameters**
- Dissolved Oxygen (Galvanic / Optical)
  - Electrical Conductivity
  - Total Dissolved Solids
  - Resistivity
  - Salinity
  - Seawater Specific Gravity
  - pH
  - Oxidation Reduction Potential (ORP)
  - Temperature
  - Depth
  - Ammonium / Ammonia
  - Chloride

- ISE**
- Fluoride
  - Nitrate
  - Calcium
- Optical**
- Turbidity
  - Chlorophyll
  - Phycocyanin (Freshwater Blue-Green Algae)
  - Phycoerythrin (Marine Blue-Green Algae)
  - Rhodamine WT Dye
  - Fluorescein Dye
  - Refined Oil
  - CDOM / FDOM (Colored/Fluorescent Dissolved Organic Matter)
  - Global Positioning System (GPS)

## The Entry Series



**AP-LITE**

The AP-LITE is a simple probe with a single optical socket. This socket is able to house any of our optical electrodes, including turbidity and chlorophyll.

**Turbidity,  
Chlorophyll,  
Blue Green Algae,  
Rhodamine,  
Fluorescein,  
Refined Oil,  
CDOM / FDOM.**



**AquaPlus**

The AquaPlus is a portable system for measuring dissolved oxygen using optical technology. Its built-in conductivity sensor facilitates salinity measurement which in turn allows automatic salinity compensation. Parameters measured includes DO, Conductivity, TDS, Resistivity, Salinity, SSG and Temperature.

### AP-LITE / AquaPlus Mechanical Specification

Protection Class	IP68 (permanent immersion)
Immersion Depth	Min 75mm. Max 100m**
Operating Temperature	-5 °C - +50 °C
Dimensions (L x Dia)	250mm x 24mm
Weight	400g

\*\*100m submersion for period of 1 week, 30m submersion suitable for permanent deployment.



**AP-700 / AP-800**

The AP-700 and AP-800 Aquaprobes are our entry level multi-parameter probes. They are designed to cover the most frequently requested parameters pH, ORP, EC, Optical DO, Temp and Turbidity with a standard 3m cable connected to the probe. Depth measurement and extended cable lengths are available upon request.

### AP-700 Package Parameters

- pH/ORP
- 4 ring Conductivity\*
- Dissolved Oxygen (Galvanic / Optical)
- Temperature

\*Additional parameters are calculated from the EC and Temperature readings

### AP-800 Package Parameters

- pH/ORP
- 4 ring Conductivity\*
- Dissolved (Galvanic / Optical)
- Turbidity
- Temperature

### AP-700 / AP-800 Mechanical Specification

Protection Class	IP68 (permanent immersion)
Immersion Depth	Min 75mm. Max 50m**
Operating Temperature	-5 °C - +50 °C
Dimensions (L x Dia)	290mm x 42mm
Weight	700g

\*Additional parameters Salinity, TDS, SSG and Res are calculated from the EC and Temperature readings.

\*\*50m submersion for period of 1 week, 10m submersion suitable for permanent deployment.



## The Advance Series



**AP-2000 (D)**

The AP-2000 probe is our entry model which is supplied with standard parameters along with 1 custom ISE Port and 1 custom Optical Port. Depth measurement is available with the AP-2000D.

### AP-2000/2000-D Mechanical Specification

Protection Class	IP68 (permanent immersion)
Immersion Depth	Min 75mm. Max 100m <sup>**</sup>
Operating Temperature	-5 °C - +50 °C
Dimensions (L x Dia)	290mm x 42mm
Weight	700g

\*Additional parameters Salinity, TDS, SSG and Res are calculated from the EC and Temperature readings.

\*\*100m submersion for period of 1 week, 30m submersion suitable for permanent deployment, depth measurement up to 60m.



**AP-5000**

The AP-5000 probe offers the customer with further flexibilities and greater sensor capacity and is capable of recording 15 parameters. The probe is supplied with standard parameters along with 4 unrestricted auxiliary ports for any combination of any ISE or Optical electrodes.

### AP-5000 Mechanical Specification

Protection Class	IP68 (permanent immersion)
Immersion Depth	Min 75mm. Max 100m <sup>**</sup>
Operating Temperature	-5 °C - +50 °C
Dimensions (L x Dia)	340mm x 55mm
Weight	950g

\*Additional parameters Salinity, TDS, SSG and Res are calculated from the EC and Temperature readings.

\*\*100m submersion for period of 1 week, 30m submersion suitable for permanent deployment, depth measurement up to 60m.



**AP-7000**

The AP-7000 probe takes long term deployment to the next level. It features a novel dual wiper system to clean ALL electrodes, keeping the sensors clean for extended monitoring. It comes with a standard set of sensors plus 6 Auxiliary ports to house any combination of ISE and Optical electrodes, allowing customers to measure up to 17 parameters.

### AP-7000 Mechanical Specification

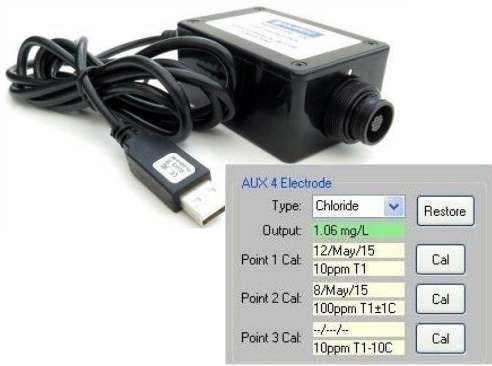
Protection Class	IP68 (permanent immersion)
Immersion Depth	Min 75mm. MAX 100m <sup>†</sup>
Operating Temperature	-5 °C - +50 °C
Dimensions (L x Dia)	440mm x 77mm
Weight	1350g

\*Additional parameters Salinity, TDS, SSG and Res are calculated from the EC and Temperature readings.

†100m submersion for period of 1 week, 30m submersion suitable for permanent deployment.



## Optional Add-Ons



The Aquaprobe PC-KIT allows you to calibrate and record measurements from an Aquaprobe without the need for a GPS Aquameter.

The Aquaprobe PC-KIT consists of the USB interface kit and the AquaCal PC application. The Aquaprobe cable is plugged into the interface box and the USB cable can be connected to your PC, once connected you can view live readings on the PC, calibrate all sensors of the Aquaprobe, perform cleaning cycles on an AP-7000 and even record measurements with data being recorded to a csv file.

## Aquaprobe PC-KIT



## AquaLogger-2000 / 7000

The AquaLogger is designed for long term unmanned logging. It is available in 2 different sizes, the AquaLogger-2000 is for use with the AquaPlus, AP-700/800, AP-LITE and AP-2000. The AquaLogger-7000 is for use with the AP-5000 and AP-7000. Both systems will record data for up to 6 months on standard alkaline “C” cell batteries and can hold up to 32,000 full data sets.

An Event Trigger feature triggers an increase logging rate when certain configured specified event are met. Software for the AquaLogger is provided for configuration of logging rates and data management.



## BlackBox

The BlackBox is a data converter that allows the water quality probes to be interfaced directly to any third party data loggers, telemetry devices and PLC systems via analogue interface or digital interface such as SDI-12 and MODBUS RS-485.

<b>Input Voltage</b>	14V – 28V DC
<b>Input Current</b>	28mA (Includes current drawn by attached Probe)
<b>Protection Class</b>	IP 67
<b>Digital Interface</b>	User selectable between SDI-12 and MODBUS RS-485
<b>Analogue Interface</b>	Two 4-20mA current loop (Pre-programmed in factory. Please specify output setting during order.)

HORIBA and our partners provide customized solutions for your telemetry needs for remote monitoring. This includes Remote Solar Powered Systems, Water Quality Monitoring Stations & etc.



## Standard Parameter Specification

<b>Optical Dissolved Oxygen</b>	Range	0 – 500.0% / 0 – 50.00 mg/L
	Resolution	0.1% / 0.01mg/L
	Accuracy	0 - 200%: ± 1% of reading. 200% - 500%: ± 10%
<b>Conductivity (EC)</b>	Range	0 – 200 mS/cm (0 - 200,000 µS/cm)
	Resolution	3 Auto-range scales: 0 – 9999 µS/cm, 10.00 – 99.99 mS/cm, 100.0 – 200.0mS/cm
	Accuracy	± 1% of reading or ± 1µS/cm if greater (see note 2)
<b>TDS*</b>	Range	0 – 100,000 mg/L (ppm)
	Resolution	2 Auto-range scales: 0 – 9999mg/L, 10.00 – 100.00g/L
	Accuracy	± 1% of reading or ± 1mg/L if greater (see note 2)
<b>Resistivity*</b>	Range	5 Ω•cm – 1 MΩ•cm
	Resolution	2 Auto-range scales: 5 – 9999 Ω•cm, 10.0 – 1000.0 KΩ•cm
	Accuracy	± 1% of reading or ± 1 Ω•cm if greater (see note 2)
<b>Salinity*</b>	Range	0 – 70 PSU / 0 – 70.00 ppt (g/Kg)
	Resolution	0.01 PSU / 0.01 ppt
	Accuracy	± 1% of reading or ± 0.1 unit if greater (see note 2)
<b>Seawater Specific Gravity*</b>	Range	0 – 50 σ <sub>t</sub>
	Resolution	0.1 σ <sub>t</sub>
	Accuracy	± 1.0 σ <sub>t</sub>
<b>pH</b>	Range	0 – 14 pH / ± 625mV (see note 3)
	Resolution	0.01 pH / ± 0.1mV
	Accuracy	± 0.1 pH / ± 5mV
<b>ORP</b>	Range	± 2000mV (see note 3)
	Resolution	0.1mV
	Accuracy	± 5mV
<b>Temperature</b>	Range	-5°C – +50°C (23°F – 122°F)
	Resolution	0.1° C/F
	Accuracy	± 0.5° C
<b>Depth</b>	Range	± 0 – 60.00m
	Resolution	1 cm
	Accuracy	± 0.5% FS
<b>Depth AP-7000 Only</b>	Range	± 0 – 99.99m
	Resolution	1 cm
	Accuracy	± 0.2% FS

\* Readings calculated from EC and temperature electrode values

Notes:

1. The accuracy figures quoted throughout this document represent the equipment's capability at the calibration points at 25°C. These figures do not take into account errors introduced by variations in the accuracy of calibration solutions and errors beyond the control of the manufacturer that may be introduced by environmental conditions in the field. Accuracy in the field is also dependent upon full calibration and minimal time between calibration and use.
2. The EC electrode can be calibrated at various points for use in fresh, brackish or salt water. The accuracy of the electrode, and therefore all derived readings, relies upon the readings being within a reasonable range of the calibration point. For taking measurements in fresh surface or ground water, use Aquaread® RapidCal solution. If this is not available, use a third party 1413µS/cm EC Calibration Standard. For taking readings in brackish or salt water, use a third party 12,880µS/cm (12.88mS/cm) EC Calibration Standard.
3. The measurement of pH and ORP relies upon the ability of the electrode to pass a minute electrical current through the water under test. For this reason, when using the standard pH/ORP electrode, the water under test must have a minimum EC (electrical conductivity) of 100µS/cm. Special low EC pH electrodes are available to special order.

## ISE Electrode Specification

<b>Ammonium / Ammonia†</b>	Range	0 – 9,000mg/L (ppm)
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 8,999.9 mg/L
	Accuracy	± 10% of reading or 2ppm (whichever is greater)
	MLD(1)	1.0 ppm
	Interfering Ions(2)	Potassium, Sodium and Magnesium
	pH Range(3)	5 - 8
<b>Chloride</b>	Range	0 – 20,000mg/L (ppm)
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 19,999.9 mg/L
	Accuracy	± 10% of reading or 2ppm (whichever is greater)
	MLD(1)	2.0 ppm
	Interfering Ions(2)	Bromide, Iodide, Cyanide and Sulphide
	pH Range(3)	2 - 11
<b>Fluoride</b>	Range	0 – 1,000mg/L (ppm)
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 999.9 mg/L
	Accuracy	± 10% of reading or 2ppm (whichever is greater)
	MLD(1)	0.05 ppm
	Interfering Ions(2)	Hydroxide (OH <sup>-</sup> )
	pH Range(3)	4 - 8
<b>Nitrate</b>	Range	0 – 30,000mg/L (ppm)
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 29,999.9 mg/L
	Accuracy	± 10% of reading or 2ppm (whichever is greater)
	MLD(1)	0.5 ppm
	Interfering Ions(2)	Chloride, Bromide, Fluoride, Sulphate, Chlorate and Perchlorate
	pH Range(3)	3 - 10
<b>Calcium</b>	Range	0 – 2,000mg/L (ppm)
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 1,999.9 mg/L
	Accuracy	± 10% of reading or 2ppm (whichever is greater)
	MLD(1)	0.05 ppm
	Interfering Ions(2)	Magnesium, Barium, Lead, Zinc and Sodium
	pH Range(3)	4 - 9

† Ammonia readings are calculated from Ammonium, pH and temperature electrode values.

**Notes:**

1. MLD (Minimum Level of Detection) is the minimum value the electrode is physically capable of measuring.
2. Each ion selective electrode is prone to interference from ions that are similar in nature to the target ion. The main interfering ions for each electrode type are listed here. If the water under test contains interfering ions, the electrode will produce erroneous readings. **Ion Selective Electrodes are not recommended for use in brackish or salt water** due to the high level of interfering ions.
3. Each ion selective electrode will only operate within a specific pH and EC range. The pH limits vary and are listed against each electrode. All ion selective electrodes work in conjunction with the pH electrode during measurement. For this reason, the selected Aquaprobe® must have a working pH or pH/ORP electrode fitted and the conductivity (EC) of the water under test must be greater than 50µS/cm.
4. All ion selective electrodes exhibit calibration drift over time. Drift should not be a major problem where the electrodes can be frequently calibrated. However, if the electrodes are to be used in long-term deployment studies, drift is almost certain to occur.

## Optical Electrode Specification

<b>Turbidity</b>	Range	0 – 3000 NTU
	Resolution	2 Auto-range scales: 0.0 99.9 NTU, 100 – 3000 NTU
	Repeatability	± 5% of reading
	MLD(1)	0.0 NTU
	MLR(2)	5.0 NTU
<b>Chlorophyll</b>	Range	0 – 500 µg/L (ppb)
	Resolution	0.1 µg/L
	Repeatability	± 5% of reading
	MLD(1)	0.1 µg/L
	MLR(2)	5 µg/L
<b>Phycocyanin (BGA-PC)</b> <small>(Freshwater Blue -Green Algae)</small>	Range	0 – 300,000 cells/mL
	Resolution	1 cell/mL
	Repeatability	± 10% of reading
	MLD(1)	200 cells/mL
<b>Phycoerythrin (BGA-PE)</b> <small>(Marine Blue- Green Algae)</small>	Range	0 – 200,000 cells/mL
	Resolution	1 cell/mL
	Repeatability	± 10% of reading
	MLD(1)	400 cells/mL
<b>Rhodamine WT Dye</b>	Range	0 – 500 µg/L (ppb)
	Resolution	0.1 µg/L
	Repeatability	± 5% of reading
	MLD(1)	0.1 µg/L
	MLR(2)	5 µg/L
<b>Fluorescein Dye</b>	Range	0 – 500 µg/L (ppb)
	Resolution	0.1 µg/L
	Repeatability	± 5% of reading
	MLD(1)	0.1 µg/L
	MLR(2)	5 µg/L
<b>Refined Oil</b>	Range	0 – 10,000 µg/L (ppb) (Napthalene)
	Resolution	0.1 µg/L
	Repeatability	± 10% of reading
	MLD(1)	100 µg/L (Napthalene)

**Notes:**

1. MLD (Minimum Level of Detection) is the minimum value the electrode is physically capable of measuring.
2. MLR (Minimum Level of Repeatability) is the value below which optical electrode readings become generally unreliable and unrepeatable (unless taken under ideal conditions) due to interfering factors such as refraction from visible air bubbles and microscopic aeration.
3. Interference by other species and compounds, which fluoresce at similar wavelengths will affect measurement accuracy of the respective fluorescence measurement.
4. Accuracy of the fluorescence measurement can be affected by differences in the response caused by temperature and ambient light.
5. Accuracy of fluorescence measurements is affected by turbidity.
6. Please refer to operator manual before calibrating and using the Fluorescence Electrodes.

## Ordering Information

### Package Set

Standard accessories for GPS AQUAMETER includes 5AA Alkaline Cells, Lanyard, USB cable with software, 'Getting Started' cards and user manuals. Standard parameters shall consist of Optical DO, EC w/ calculated parameters, pH, ORP, Temperature & depth measurement unless otherwise indicated. Extended cable lengths option is available upon request.

AP-LITE Package	Supplied with complete set of GPS AQUAMETER with AP-LITE Probe, 3m cable, rugged carrying case and accessories.
AquaPlus Package	Supplied with complete set of AquaPlus GPS Meter with AquaPlus Probe (w/ Optical DO, EC & Temperature), integrated 3m cable, hard carrying case and accessories.
AP-700 (Optical) Package	Supplied with complete set of GPS AQUAMETER with AP-700 Probe (w/ standard parameters except depth), integrated 3m tough cable with metal AquaConn connector, hard carrying case and accessories. Shipped with a 250mL RapidCal solution, a pH Electrode Storage Cap, a 25mL bottle of Storage Solution, a calibration / rinse bottle and a probe sleeve cap with end cap plug. (Galvanic DO & Depth sensor option on request)
AP-800 (Optical) Package	Supplied with complete set of GPS AQUAMETER with AP-800 Probe (w/ standard parameters and Turbidity, except depth), integrated 3m tough cable with metal AquaConn connector, hard carrying case and accessories. Shipped with a 250mL RapidCal solution, a pH Electrode Storage Cap, a 25mL bottle of Storage Solution, a calibration / rinse bottle and a probe sleeve cap with end cap plug. (Galvanic DO & Depth sensor option on request)
AP-2000 Package	Supplied with complete set of GPS AQUAMETER with AP-2000 Probe (w/ standard parameters except depth), 3m cable, rugged carrying case and accessories. Shipped with a 250mL RapidCal solution, a pH Electrode Storage Cap, a 25mL bottle of Storage Solution, a calibration / rinse bottle and a probe sleeve cap with end cap plug.  Optional add on with either 2 ISE electrodes or 1 ISE electrode + 1 Optical Electrode
AP-2000-D Package	Supplied with complete set of GPS AQUAMETER with AP-2000-D Probe (w/ standard parameters), 3m cable, rugged carrying case and accessories. Shipped with a 250mL RapidCal solution, a pH Electrode Storage Cap, a 25mL bottle of Storage Solution, a calibration / rinse bottle and a probe sleeve cap with end cap plug.  Optional add on with either 2 ISE electrodes or 1 ISE electrode + 1 Optical Electrode
AP-5000 Package	Supplied with complete set of GPS AQUAMETER with AP-5000 Probe (w/ standard parameters), 3m cable, rugged carrying case and accessories. Shipped with a 250mL RapidCal solution, a pH Electrode Storage Cap, a 25mL bottle of Storage Solution, a calibration / rinse bottle and a probe sleeve cap.  Optional add on with any 4 ISE or Optical electrodes
AP-7000 Package	Supplied with complete set of GPS AQUAMETER with AP-7000 Probe (w/ standard parameters), 3m cable, AquaLink Software and accessories. Shipped with a dual wiping self cleaning system, pH storage cap, a 25ml bottle of storage solution and a probe sleeve cap.  Optional add on with any 6 ISE or Optical electrodes





Also consider

Measure and Display up to 11 Items Simultaneously

Rugged Outdoor Design



## Multi-parameter Water Quality Meters U-50 Series

Easy to read LCD Display and Easy Operation

Control Unit Design for Field Operations

Data Management

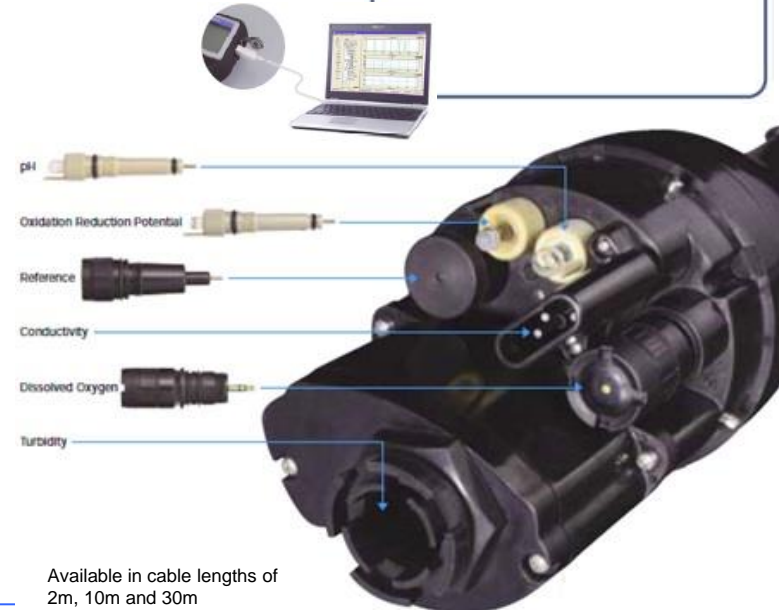
Multiple Sensors Housed in Each Probe

\*Request for separate brochure

The system can be used in conjunction with the Global Positioning System (GPS) to record latitude, longitude, and other location data for individual measurements. This is particularly useful for environmental surveys.

	U-51	U-52	U-52G	U-53	U-53G	U-54	U-54G
pH	●	●	●	●	●	●	●
ORP (Oxidation Reduction Potential)	●	●	●	●	●	●	●
Dissolved Oxygen	●	●	●	●	●	●	●
Conductivity	●	●	●	●	●	●	●
Salinity	●	●	●	●	●	●	●
TDS (Total Dissolved Solids)	●	●	●	●	●	●	●
Seawater Specific Gravity	●	●	●	●	●	●	●
Temperature	●	●	●	●	●	●	●
Turbidity (LED)	—	●	●	—	—	●	●
Turbidity (Tungsten lamp)	—	—	—	●	●	—	—
Water depth	—	—	●	●	●	●*	●*
GPS	—	—	●	—	●	—	●

Note: \*U-54/G(2m) don't have the feature of water depth.



Available in cable lengths of 2m, 10m and 30m

### H-1



The on-site installation type H-1 series Analyzers and Transmitters offer a rainproof structure. This has been newly developed under the concepts of “durability”, “functionality”, and “maintainability” in order to stand the severe environmental conditions of on-site processes. This series of units comprehensively can use all kinds of water treatment from purified water monitoring to waste water monitoring.

Contact our sales representative for more information.

pH ORP DO COND TURB RC MLSS NH<sub>4</sub> F<sup>-</sup> COLOR SL COD UV N P Oil

Contact our local distributor: