

## Full-Spectrum Water Quality Monitoring Station

## ATE5300

### Features

- Based on UV-Vis full-wavelength absorption spectroscopy and electrode methods; requires no chemical reagents and produces no secondary pollution.
- COD, BOD, turbidity, suspended solids, total phosphorus (TP), total nitrogen (TN), ammonia nitrogen, pH value, water temperature, conductivity, etc.
- Modular design allows customers to select different combinations of water quality monitoring parameters.
- Professional lightning surge protection circuit design, equipped with a solar power supply system to ensure stable 24/7 operation.
- Pump-suction water intake; sampling interval and duration are configurable based on actual needs, enabling unmanned operation.
- RS485, NB-IoT, 4G, 5G data transmission methods, allowing seamless integration with terminal water quality monitoring platforms.
- Large touch-screen intelligent display with simple operation.
- Automated cleaning and detection functions, providing longer maintenance intervals and enhanced stability.

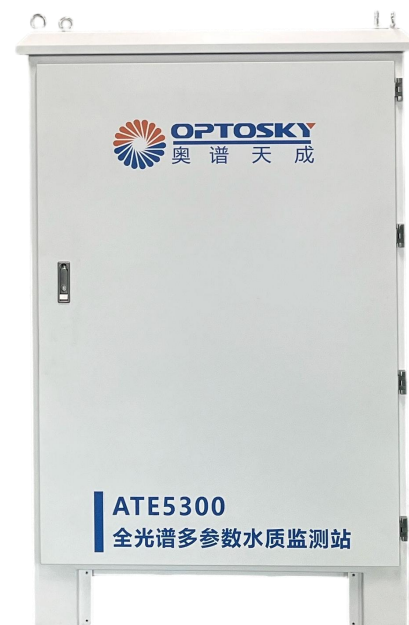
### Applications

- Drinking Water Sources, Water Plant Inlets: Conventional five parameters, ammonia nitrogen, COD, cyanobacteria, chlorophyll, oil in water, etc.
- Environmental Protection: Conventional five parameters, chlorophyll, cyanobacteria, ammonia nitrogen.
- Municipal Wastewater: Conventional five parameters, ammonia nitrogen, COD.
- Agriculture (Ecology, Aquaculture): Conventional five parameters, ammonia nitrogen, COD.
- Industrial Discharge: Conventional five parameters, ammonia nitrogen, COD.

### Description

ATE5300 is a highly integrated extraction-based water quality micro-monitoring station, consisting of a cabinet, sensor analysis unit, water intake unit, sample retention unit, and data acquisition/transmission system. Water quality monitoring parameters can be customized according to actual customer needs, with signal outputs supporting RS485, NB-IoT, 4G, 5G, and other data transmission methods to meet various application scenarios.

With the advancement of ecological environment monitoring networks and the promotion of water quality grid-based monitoring, water environment automatic monitoring stations require denser deployment to meet big data application demands such as pollution traceability, water quality early warning, and river chief system assessments. The ATE5300 project is specifically developed to address current requirements in environmental protection, water conservancy, and water management sectors for high density, high frequency, and low cost. It offers advantages such as small footprint, no land acquisition needed, flexible installation, short construction cycles, and low cost, enabling real-time online monitoring of multiple parameters.



## 1. Selection Guide

## 2. Parameter

| Water Quality Monitoring Sensor Parameters           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                         |                   |            |          |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|-------------------|------------|----------|
| Basic Measurement Parameters<br>(Range Customizable) | Monitoring Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Measurement Principle | Minimum Detection Limit | Measurement Range | Resolution | Accuracy |
|                                                      | Chemical Oxygen Demand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Spectroscopy          | 1mg/L                   | 0-500mg/L         | 0.01mg/L   | ±10%F.S  |
|                                                      | Total Phosphorus (TP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Spectroscopy          | 0.01mg/L                | 0-100mg/L         | 0.01mg/L   | ±30%F.S  |
|                                                      | Total Nitrogen (TN)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Spectroscopy          | 0.1mg/L                 | 0-100mg/L         | 0.01mg/L   | ±30%F.S  |
|                                                      | Ammonia Nitrogen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Spectroscopy          | 0.1mg/L                 | 0-100mg/L         | 0.01mg/L   | ±30%F.S  |
|                                                      | Turbidity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Spectroscopy          | 0.1NTU                  | 0-100NTU          | 0.01NTU    | ±10%F.S  |
|                                                      | Total Suspended Solids (TSS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Spectroscopy          | 1mg/L                   | 0-100mg/L         | 0.01mg/L   | ±10%F.S  |
|                                                      | Water Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Thermocouple          | No Detection Limit      | 0-50°C            | ±0.01°C    | ±0.5°C   |
| Supports Extended Parameters<br>(Range Customizable) | PH Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Glass Electrode       | 0.01PH                  | 0-14PH            | ±0.01PH    | ±0.05PH  |
|                                                      | Conductivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Graphite Electrode    | 1μS/cm                  | 0-5000μS/cm       | 1μS        | ±5%FS    |
|                                                      | Dissolved Oxygen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fluorophotometry      | 0.01mg/L                | 0-20mg/L          | 0.01mg/L   | ±5%FS    |
|                                                      | Chlorophyll                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fluorescence Method   | 0.1μg/L                 | 0-400ug/L         | 0.1μg/L    | ±5%FS    |
| Overall System Parameters                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |                         |                   |            |          |
| Power Supply System                                  | 1) Supports solar power and mains electricity supply;<br>2) Lightning surge protection circuit design for safe and stable operation under all weather conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                         |                   |            |          |
| Water Intake System                                  | 1) Water intake and distribution design: Equipped with a single pump function and dual water intake pipelines (one for backup); cross-shaped filter screen and liquid level probe installed at the water intake to prevent large particles/pollutants/suspended solids, ensuring the pump operates 50-100 cm below the water surface to avoid sediment intake.<br>2) Sampling function: Controls water intake volume and monitors sampling time, with automatic drainage and cleaning after measurement.<br>3) Water intake pipeline: Single-pipeline intake and drainage design, with a backup pipeline and one filter pumping module to prevent sediment entry. |                       |                         |                   |            |          |

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|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Automatic Sample Retention System              | Equipped with one or more sets of over-limit water sample retention functions for evidence collection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Self-Cleaning System                           | Single-path water intake with automatic pre-sampling cleaning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Data Acquisition System                        | Integrated water quality monitoring parameter modules; customers can select different sensor modules based on measurement requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Control and Data Acquisition Transmission Unit | <ol style="list-style-type: none"> <li>1) 10.1-inch color touchscreen with Chinese interface for easy operation, supporting parameter calibration and historical alarm record queries.</li> <li>2) Capable of outputting full spectral graphs and absorbance curves with storage function.</li> <li>3) Control software enables device operation monitoring, parameter configuration, storage of historical data and system logs, and communication with central platforms.</li> <li>4) Data storage, query, and export functions: Local support for data queries and historical data export, with non-volatile historical data storage.</li> <li>5) Data re-transmission function: Automatically resends data to the platform when network communication resumes after interruption.</li> <li>6) Allows debugging of single control points (valves, pumps, etc.), control of water intake, distribution, and analysis units, with recording and display of control point status and pump on/off states.</li> <li>7) Real-time data acquisition with customizable monitoring frequencies based on regulatory needs, transmitting to cloud platforms and displaying results on PC.</li> <li>8) Capable of real-time video capture and transmission to central platforms.</li> <li>9) Supports simultaneous connection of multiple monitoring terminals, compatible with common water quality monitoring devices, with comprehensive external interfaces including <math>\geq 4</math> RS485 Modbus RTU protocol channels for future expansion.</li> <li>10) Includes <math>\geq 2</math> 30A relay channels and <math>\geq 4</math> analog input channels for remote control and other functions.</li> <li>11) Positioning: Supports GPS + BeiDou navigation systems.</li> <li>12) Remote maintenance features: Remote configuration, software upgrades, and system reboot.</li> <li>13) Optional smart integration: Water immersion alarms, temperature/humidity anomaly alerts, etc.</li> </ol> |
| Cabinet Integration                            | Cabinet made of stainless steel with internal insulation layer and double-layer thermal structure; interior includes sheet metal components, air cooling system, power distribution unit, and lighting system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Cabinet Dimensions                             | 600*1000*1600mm; (Customizable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Cabinet Weight                                 | $\geq 100\text{kg}$ ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Operating Voltage                              | 24V DC;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Rated Power                                    | $\leq 100\text{W}$ ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| Protection Rating     | IP54;                                           |
| Operating Temperature | 0-50°C(with anti-freezing protection function). |

## 3. Packing List

| No. | Item                        | Remarks                                                                              |
|-----|-----------------------------|--------------------------------------------------------------------------------------|
| 1   | ATE5300_Mains_Power_Version | The power supply method can be selected based on customer needs and site conditions. |
| 2   | ATE5300_Solar_Power_Version |                                                                                      |

Note: The shipping lists for the mains power and solar power versions differ, primarily in the configuration of solar power-related accessories.

## 4. Applications



Water Quality Monitoring Application Case in a Wastewater Treatment Plant



Water Quality Monitoring Application Case in a Reservoir



Water Quality Monitoring Application Case in a River Channel



Water Quality Monitoring Application Case in an Estuary



Water Quality Monitoring Application in a Scenic Area Stream



Water Quality Monitoring Application in an Underground Domestic Sewage Well

## 5. Effect Diagram

