EWAI Products

GC-MS 3100/3200 Gas Chromatograph-Mass Spectrometer (Quadrupole)
GCxGC TOF MS 3300 Comprehensive Two-dimensional
Gas Chromatograph – Time of Flight - Mass Spectrometer
GC-MS 3110 Mobile Gas Chromatograph-Mass Spectrometer
GC-4000A/4100 Series Gas Chromatograph
EW-4400 Portable PID Gas Analyzer
LC-5510/5520 High Performance Liquid Chromatograph
IC-2800 Ion Chromatograph
ICP-1000II Automatic ICP Spectrometer
ICP-7700 ICP Spectrometer
AA-7001/7003/7020/7050/7090 Atomic Absorption Spectrometer
AA-7003M/7030A Medical Atomic Absorption Spectrometer
AF-7500/7500B/7550 Atomic Fluorescence Spectrometer
XD-8010 Energy Dispersive X-Ray Fluorescence Spectrometer
XF-8100 Wavelength Dispersive X-Ray Fluorescence Spectrometer
CA-9000 Mobile Lab for Inspection
Coal Mine Analyzers
Data Processing Workstations
LIMS Laboratory Information Management System

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AA-7050 Series

Atomic Absorption Spectrometer

EAST & WEST ANALYTICAL INSTRUMENTS, INC.

Simply Precise

Founded in 1988 by two senior engineers, East & West Analytical Instruments, Inc. (EWAI) has over 25 years of experience in providing a wide range of analytical solutions to fulfill our customer’s needs.

From the beginning, innovation has always been at the core of our business. With the introduction of the GC-MS 3100 in 2007, we became the first domestic manufacturer to produce a commercial GC-MS system. Through continuous focus on research and development, we have expanded our product line to include GC, GC-MS, LC, AAS, AFS, and XRF. Along the way, we have collected more than 30 patents and more than 100 awards and certificates. Our quality products provide solutions for applications ranging from mining to food safety.

EWAI is dedicated to maintaining a high quality of products and after-sale services. We have more than 30 branches in China and distributors in more than 20 countries. With our large and well trained service team, we can guarantee excellent service regardless of your location.

In 2013, EWAI and GBC Scientific Equipment Pty. Ltd. of Australia entered into a strategic partnership. This acquisition is a major step forward in our quest to become a diverse and internationally recognized manufacturer in the global analytical instruments industry. GBC adds to EWAI’s already long product line with a variety of products and solutions including AAS, UV-Vis, ICP,

- ISO9001 Quality Management System Certificate
- 21315 Quality Credit AAA Grade Certificate
- Top Ten Chromatography Instrument Awards from BCEIA
- Gold Award from BCEIA
- The Designated Enterprises for Coal Mine Safety Equipment
- The Most Popular Manufacturer Award in the instruments and equipment industry
- ISO14001 Environmental Management System Certificate
- CE Certificate
- Top Ten Spectroscopy Instrument Awards from BCEIA
- Innovation Award
- Beijing Science and Technology Award
- Scientific Instruments Product Excellence Award

High Tech Enterprise Certificate


ISO9001

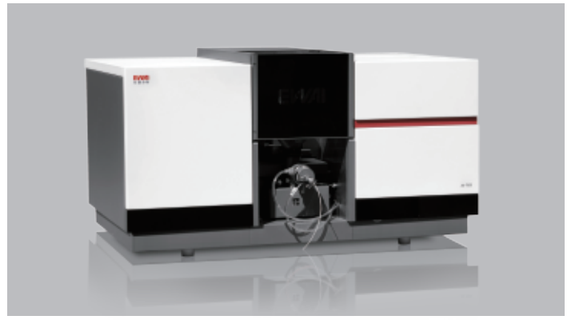

ISO14001


Innovative Design Red Star Award

National Important New Product

AA-7050 Series
Atomic Absorption Spectrophotometer

Application



The AA-7050 series atomic absorption spectrophotometer can be widely used in the fields of metallurgy, petrochemical industry, geology, medical science, environmental protection, scientific research, agriculture, disease control, food, material science, quality inspection etc. The AA-7050 series can be used to analyze over 70 elements at both normal or trace levels.

Features

Advanced Optical System

• The AA-7050 series features a unique suspension design for the optical system. Shaking of the instrument bench or change of the environmental temperature will have no effect on the instrument’s stability. (Patent No. ZL200620023296.X)

• First domestic manufacturer to use an 1800 lines/mm diffraction grating, which increases resolution and energy efficiency.

• A single beam and short optical system allows for a strong signal and very low detection limits for elements such as As, Se among others.

• Carefully designed deuterium lamp background reduction and self-absorption background reduction results in more accurate calibration.


A patent for our unique optical system suspension design.

Integrated Design

• The AA-7050 features an integrated flame and graphite furnace design that contains the optical system, atomizer, graphite furnace power supply and electronics all in one unit. It is first such design and one of the most compact AAS in the world. (Patent No. ZL200620023298.9)

• Optimized lamp power supply technology to prolong lifetime of element lamps.


A patent for our compact AAS design.

Automated Switch between Flame and Graphite Furnace

• Features automated or manual switching between flame and graphite furnace in less than 2 seconds.

• Optics do not need to be adjusted between switches. (Patent No. ZL200620023297.4)


A patent for our flame/ graphite furnace workhead switching design.

Reliable Safety System

• Safe and reliable control alarm devices to ensure over-current protection for hollow cathode lamps.

• Under-pressure protection of combustion gas/protection gas, leakage alarm of combustion gas, over-heating protection for graphite furnace and protection against abnormal flame.

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Flexibility

• Optional HG-01 hydride generator that utilizes a heated ceramic tube to realize trace analysis of As, Pb, Se, Hg, Bi, Sb, Sn, Te with high sensitivity.
• Flame autosampler (optional).
• Optional graphite furnace autosampler that allows for automated preparation of standard solutions and automated analysis.
• Nitrous Oxide/Acetylene selection system（optional）

High Degree of Automation

• Automatic wavelength positioning, automatic slit switch and automatic optimization of lamp current and gain. All of these operations can be completed within 40 seconds.

• The eight lamp rotating turret is controlled by computer for automated

element lamp selection, which allows for automated analysis of up to eight elements in sequence.

• Automatic flame ignition, automatic control of the deuterium lamp and its facula, and automatic switch of graphite furnace power supply.

Automatic Flame Height Adjustment

• Automatically find the optimal flame height for best analysis condition.

Automatic Liquid Trap Protection

Flame ignition is controlled with a combination of a float inside the liquid trap and a solenoid to avoid acetylene leakage due to lack of water in the liquid trap. This increases operation safety.

Deuterium lamp background

When using deuterium lamp background correction, the instrument will automatically configure the deuterium lamp and optimize its position to increase the concentricity between the deuterium beam and element beam to the greatest extent, which allows for the best background correction results.

Graphite furnace saving gas mode

The intelligent control of the protection gas switch maximizes the effective use of protection gas and reduces waste when the gas is not needed, cutting down on the cost of operation.

Temperature correction programs

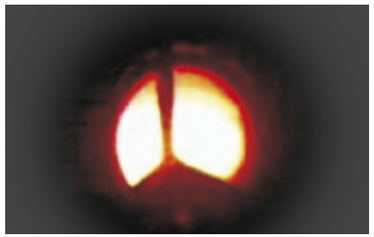
Temperature correction programs for two types of graphite tubes, standard and extended lifespan tubes, are built into the software. Using the extended lifespan tubes, for typical analysis of Pb, tube firings can reach >1,000 firings before replacement.

Multi-Element analysis

• Automatic multi-element analysis: After editing method, in cooperation with autosampler, the instrument can automatically set method parameters, including automatic wavelength selection, automatic slit setting, automatic element lamp position adjustment, automatic burner head position adjustment, automatic deuterium lamp switch, automatic atomizer switch, automatic ignition, and so on.
• Multi-element analysis in same project: Multiple elements can be established in same project, analysed according to sequence, and the comprehensive report can be printed out.

Graphite furnace viewing system

The graphite furnace can be observed in real time through the graphite furnace viewing system which uses a camera. The whole analysis process from sample injection to atomization can be observed. By observing the desolventizing, drying and ashing process, parameters can be optimized to obtain more accurate results. The position of injection probe and light beam can be constantly monitored to check for probe damage and alignment issues which may lead to inaccurate results.



Auxiliary Gas

Auxiliary gas, such as oxygen, can be used in the internal gas path of the graphite furnace to sufficiently remove organic components of the sample during the ashing treatment phase in order to reduce interference and increase analysis accuracy.

• Intelligent frequency conversion

The software can intelligently identify the power frequency and automatically match it. Suitable for the power supply frequency instability or other frequencies power grid.

The AA-7050series of the simplified table

Model	Explanation
AA-7050	Flame atomizer, graphite furnace
AA-7050F	atomizer
AA-7050G	Flame atomizer

Excellent Graphite Furnace

Advanced Longitudinal Heating Mode

Atomization temperature can reach 3000 ℃. This meets the atomization temperature demands of Ni, Mo, V, Co, etc.

High Stability

Advanced optics system ensures high optical energy of the instrument. High signal-noise ratio ensures repeatable data.

Maximum Sample Size Increased

Maximum sample size is 70 μL. This feature is useful for multiple samples and analysis of samples with low concentrations.

High Performance Background Correction

Continuous light source (D2) and self absorption background correction is capable of 1 A of background correction.

Fast Heating

Optical temperature control greatly increases heating rate and allows for rapid atomization.

High Precision Homogeneous Heating

Unique design of the graphite furnace ensures homogeneous heating during atomization to obtain accurate data.

Titanium Nebulizer and Burner

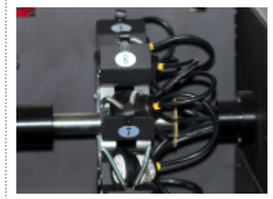
Utilizing aerospace technology, the industrial grade pure titanium nebulizer and burner head is cast using the paraffin method. These parts have excellent resistance to corrosion and oxidation, can withstand high temperatures, and are extremely durable.

Convenient Injection Port

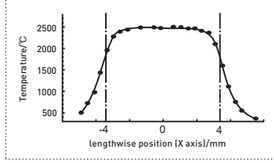
Design of the injection port simplifies sample injection and decreases error. Good precision can be obtained even by manual injection.

Advanced Graphite Furnace

Graphite cone can be replaced when worn to ensure stable conductivity of electrodes. (Patent No. ZL200720104071.1)



Eight Lamp Rotating Turret



Iso-temperature Line During Atomization

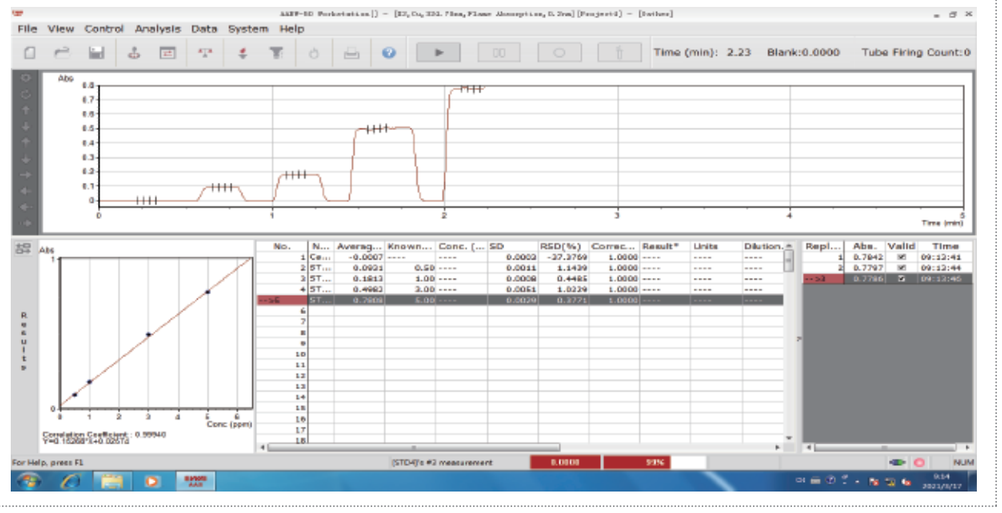
Titanium Nebulizer

Convenient Injection Port

Graphite Furnace and Graphite Cone

Patent Certificate of Graphite Furnace

Data Processing Workstation



Software Interface

User Friendly Interface

Run on the Windows XP operating system in many languages including Chinese, English, and Korean among others.

Strong Analysis Capabilities, Fault-tolerant Processing, and Flexible Modification of Curve Fitting Equation

Report Printing

Customizable report templates are capable of generating reports of any format the user may need.

Powerful Data Management

The workstation has powerful data management capabilities including backup and subsequent treatment of historic data, including search, edit, sort, etc. Data files can be exported into many different formats.

QA/QC Control

The QA/QC feature allows for automated determination of whether the analysis result or some function of the result exceeds user-defined limits. If the result exceeds the limit, the system automatically runs the analysis again according to setup parameters. Functions of QA/QC include standard deviation (SD) detection, relative standard deviation (RSD) detection, correlation coefficient detection, QC detection, baseline drift (sensitivity correction) detection, sample upper limit detection (automatic online dilution).

Instrument Control

Automatic selection of element lamps, automatic wavelength scanning, automatic slit switch, automatic setup of lamp current.

Status Monitoring

Real-time dynamic monitoring of working conditions. For flame method: type of burner head (air + acetylene or nitrous oxide + acetylene), water level of the liquid trap, status and pressure of the combustion gas and the oxidant gas, flow rate of the combustion gas, acetylene leakage alarm. For graphite furnace method: over-current protection, water temperature, water flow rate, pressure of the protection gas.

Management of Lamp Use Time

Automatically records the usage time of element lamps.

Graphite tube firing count monitoring

Technical Specifications

Optical System

Wavelength range: 190~900 nm

Mono-Chromator: C-T Grating Mono-Chromator
Wavelength repeatability: ⩽0.05 nm
Blaze Wavelength: 250 nm
Resolution: better than 0.1nm

Spectral bandwidth: Automatic switching between 5 levels: 0.1, 0.2, 0.4, 1.0, 2.0 nm
Wavelength accuracy: ±0.1nm
Grating: 1800 lines/mm
Baseline Stability: ⩽0.003A/30 min (Static)
⩽0.002A/30 min (Dynamic)

Flame Method

Benchmark Concentration of Cu: ⩽0.02 μg
Precision RSD: ⩽0.6%
Position Adjustment: Adjustable height and angle. Flame to hydride can be switched in less than 1 minute.

Detection Limit: ⩽0.003 μg/ml
Burner: Interchangeable full titanium burner of 50mm and 100 mm

Background Correction

Background correction is available for both flame and graphite furnace method.
Correction mode: Deuterium lamp, Self absorption background correction(optional)
Correction capability: When background absorption approaches 1.0 Abs, the instrument is capable of a background correction of 60 times or more.

Graphite Furnace Method

Benchmark Concentration of Cd: 0.3×10^{-12} g
Temperature Range: Room temperature to 3000 ℃
Temperature Control Program: Max 20 step temperature program. 3 modes of temperature rise: step, slope and flat.
Heating Modes: Max power heating and optical control rapid heating

Detection Limit: 0.2×10^{12} g
Precision RSD: ⩽1.8%
Optical Control Temperature Rise Rate: ⩾3000 ℃/s
Max Power Temperature Rise Rate: ⩾2000 ℃/s

Temperature control modes:
power control mode: Accuracy⩽1%,
Reproducibility⩽0.5%
Optical control mode: Optional

Data Processing

Measurement methods: Flame absorption, flame emission, graphite furnace, and hydride method
Analysis method: Linear fitting, nonlinear fitting, standard addition method
Printing output: Calibration curve, spectrum, analysis conditions, analysis parameters, and analysis results can be automatically stored and printed.

Main Unit with Integrated Graphite Furnace Power Supply

Dimensions: 880 (L) x 540 (W) x 450 (H) mm, 125 kg
Power Supply: ~220 V 50 Hz single phase, main unit power: 200 W, graphite furnace power: 4 KW

High Accuracy Graphite Furnace Analysis System

The most important specification of a graphite furnace analysis system is the repeatability of analysis data. The precision requirement of trace analysis depends on the concentration level of the sample, which varies based on application. A quality graphite furnace analysis system must satisfy all such requirements. Additionally, it must have accurate temperature control, high quality graphite tubes, a fast heating system, fast signal processing electronics and easy to use analysis software.

High Precision Analysis of Boundary Wavelength Elements

Boundary atomic absorption wavelengths elements include As (193.7 nm) and Cs (852.1 nm). Their spectral lines have very low energies on the high or low end of the mono-chromator grating. Analysis performance of these two elements can be used to evaluate the optical characteristics of an instrument. Analysis results of these two elements by graphite furnace method are shown in Figure 1.

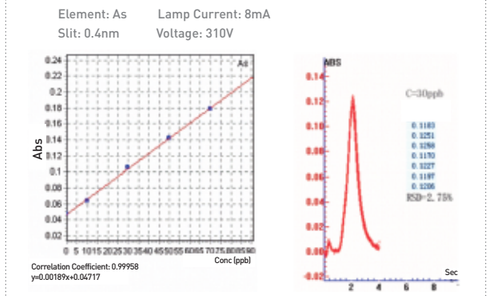


Figure 1 Linearity and RSD% of element As

The figures to the right show an RSD% of 2.95% for 7 consecutive manual samples of 20 µL of 5 µg/L Cs solution, and an RSD% of 2.75% for 7 consecutive manual samples of 20 µL of 30 µg/L As solutions.

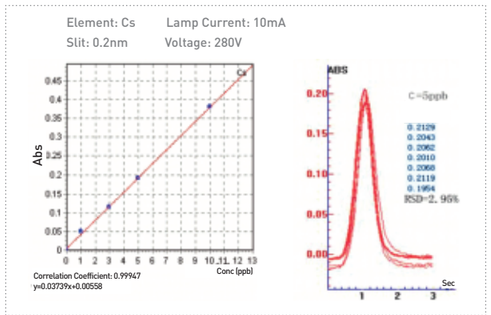


Figure 2 Linearity and RSD% of element Cs

Analysis of Cd and High Atomization Temperature Element Mo

The element Cd is selected for analysis by graphite furnace due to its high sensitivity. High atomization temperature element Mo can easily form a carbide in graphite furnace, so its analysis data reflects high temperature behaviors of the graphite furnace, the quality of graphite tubes and the sensitivity of high atomization temperature elements.

Below are the graphite furnace analysis results for Cd and Mo.

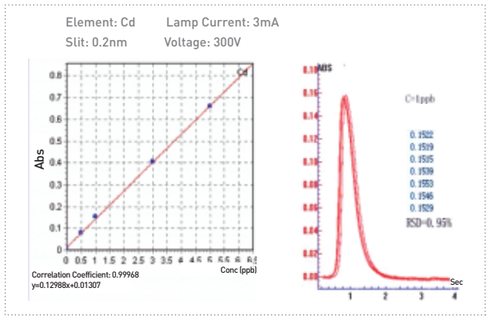


Figure 3 Linearity and RSD% of element Cd

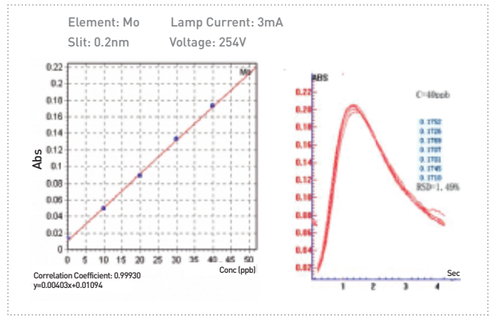


Figure 4 Linearity and RSD% of element Mo

The figures above show an RSD% of 0.95% for 7 consecutive manual samples of 20 µL of 1 µg/L Cd solution, and an RSD% of 1.49% for 7 consecutive manual samples of 20 µL of 40 µg/L Mo solutions.

The linearity of the results shown above in addition to using a negative high voltage of no more than 300 V shows the sensitivity and stability of the graphite furnace system. Even for a high atomization temperature, low sensitivity element such as Mo, the system delivers satisfactory sensitivity.

State-of-the-art Graphite Tube Design

The graphite tube is the core component of the graphite furnace system. In addition to using high grade graphite material, a sound mechanical design of the graphite tube is a key factor to creating an isothermal state. Figure 5 shows a cross-sectional view and figure 6 is a temperature diagram of the AA-7050 series graphite tube.

To create isothermal conditions in the atomization zone, two rings with a smaller inner diameter were added in the middle of the graphite tube. The tube wall between the two rings was thinned in order to increase the electric current density to ensure isothermal conditions in the 8 mm long, 170 mm^3 volume atomization zone. This design increases the sensitivity and precision while reducing the interference of the system. Figure 6 shows the isothermal condition of the 8 mm long atomization zone. The maximum capacity of the tube is 70 µL.

As you can see, the AA-7050 graphite furnace analysis system is an excellent analysis system with high accuracy and precision, and can compete with any advanced graphite furnace system on the market. Additionally, the small graphite furnace with low energy cost (maximum 4KW, 220 V) is economical and suitable for lab use.

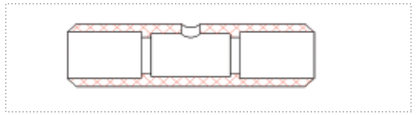


Figure 5 Cross-Sectional View of AA-7050 series Graphite Tube

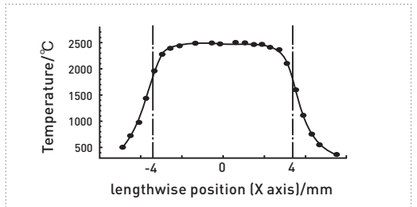


Figure 6 Temperature Diagram of the Graphite Oven

HG-01 Hydride Generator

The HG-01 uses a peristaltic pump for sample injection, and has an atomizer consisting of a ceramic electric heating tube heating a quartz tube. It allows for ultra low trace analysis of the eight elements (As, Se, Hg, Pb, Bi, Sb, Sn and Te), which have relatively low sensitivity using the atomic absorption method. The instrument is fast and easy to operate. It is compatible with any AAS using the hydride-atomic absorption method.

Features

• Samples are continuously pumped by 3 channels using a peristaltic pumps. Injection volume is 1~5 mL.

• Uses Tygon wear-resistant durable pump tube. The life span of these pump tubes can be as long as 500~1000 hr.

• Using a uniquely designed ceramic electric heating tube, the HG-01 is oxidation-resistant and expels no waste. It can withstand temperatures of up to 1000 ℃ for a many hours with no damage to the quartz tube.

• Temperature control is fast and accurate. The temperature range is 100~1000 ℃ with an accuracy of ±2 ℃.The optimal atomizing temperature can be quickly reached and precisely controlled.

• Compact design and easily mounted on the AAS in the flame nebulizer base position.

AS-600 Flame / Furnace Auto-Sampler

• At most 133 sample holders including 5 holders used for solutions.Many kinds of sample plates and both plastic and quartz injection tubes are compatible.

• Without moving the autosampler, automatic sampling can be switched from flame to graphite furnace or vice versa. Manual injection can be processed without removing the autosampler.

• Sampling depth and injection depth are software controlled.

• Sampling of tested samples, standard samples and chemical modifiers are all software controlled.

• After solution injection, the software will start the graphite furnace heating program automatically.

• The system immediately enters the automatic cleaning procedure after each injection to prevent pollution of samples. After each injection, the system runs an automatic rinse procedure to prevent samples from being contaminated.

• Automatic concentration and dilution.

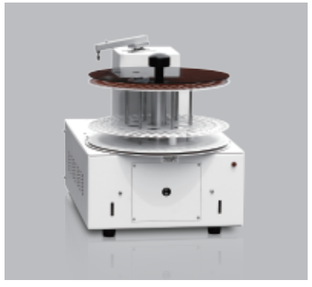
• Graphite furnace supports hot injection and reservation function.

AS-200 Auto-Sampler for Flame

• 123 positions for samples, 6 positions reserved for standard solution, blank solution, etc.

• The injection time and freguency can be set automatically through software.

• Automatic rinse.



EW-320AC Air Compressor

• The EW-320AC is a double cylinder piston compressor that is stable, reliable and oil-less.

• It uses three filters(two filters for gas inlet and one filter for gas outlet) to ensure that the gas output is pure.

• Provides clean and dry compressed air with constant pressure for atomic absorption spectrometers.

Model	Gas Flow	Pressure Range	Dimensions	Features	Note
EW-320AC	20L/min	0.005 ~ 0.3 Mpa	400(W)×300 (L)×635 (H)	Quiet oilless dual piston compressors	Manual drain

EW-900CH Water Cooling System

The EW-900CH Water Cooling System is designed for various industrial applications with a strong protection and alarm system. It has the unique option of a purification configuration that ensures pure water is produced. This system provides a variety of alarms and output connections, along with a water level alarm, over temperature alarm and water flow alarm. All configurations can be customized according to the user's requirements.

Features

• Large volume open tank, easy to clean, easy to do water bath testing.

• Multiple alarm protection, including water level alarm, water flow alarm and over temperature alarm

• Optional configurations for water purification

The first option: full stainless steel water pipelines;

The second option: built-in filtering devices to ensure water quality.