Multitype ICP Emission Spectrometer

ICPE-9000
ICPE-9000
ICP-AES Multitype ICP Emission Spectrometer

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ICP emission spectrometers are analytical instruments used in a broad range of fields. They feature high ppb level detection ability, broad 5-6 digit analysis concentration ranges, and batch analysis of multiple elements. Recent wider usage has resulted in an increased demand for shorter analysis times and improved high-matrix sample detection. As a result, we have developed two models - a “multitype” using a semiconductor detector to shorten analysis times, and a high-resolution sequential type for improved detection.

Shimadzu’s ICPE-9000 multitype ICP emission spectrometer includes our new ICPEsolution software, a radical departure from conventional thinking. Making full use of the ICPE-9000’s multitype performance, problems with measurement samples can be evaluated in a number of ways. The Assistant Function automatically carries out wavelength selection for measured elements and interference correction for coexisting elements, tasks that typically relied on the skill of the analyst. Simple and accurate measurement is possible even with hard-to-measure high-matrix samples.
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ICPE-9000

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Assistant software simplifies plasma emission spectroscopy.

MULTI TYPE

ICPEsolution

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Multifaceted diagnosis of coexistent element interference quantities. Methods are automatically corrected, based on determining the necessity of each type of correction.

Simple and Accurate

Simply and accurately measure all types of samples.
Ultra-Trace Element Detection and Component Analysis for Highly Precise Analytical Results

In addition to standard high-precision elemental analysis for R&D, Shimadzu’s ICPE-9000 multitype emission spectrometer can also be used in application stages requiring high-precision analytical assessments, including elemental analysis of important major elements for production control, activities requiring environmental management analysis such as water quality control, ultra-trace element analysis and high-concentration component analysis.
Leading-Edge Proprietary Analysis Technology for Superior Reliability and Operability

**Spectral Interference Elements Database**
Adds data on the interference amount due to adjacent coexisting element spectrums to the conventional wavelength database. This, in turn, allows accurate calculation of the extent of interference with analysis data from coexistent elements.

**Simple selection of analysis elements**
After simply choosing elements for analysis from the qualitative results, the Method Development Assistant automatically selects the optimal wavelength from the interference element database. When necessary, correction information is automatically created by the Assistant, which means that the same high-level measurement conditions created by experienced analysts through trial and error can now be easily reproduced.

**Automatic selection of optimal analysis wavelengths**
The ICPE-9000 automatic wavelength selection system completely automates the troublesome task of wavelength selection. After measurement, the optimal wavelength is selected for the measurement sample from all of the wavelengths registered, and the measurement results are then displayed. Further, the optimal wavelength is selected for each measurement sample, ensuring reliable results, even with unanticipated spectral interference.

**Method Development Assistant**
Automated setting of measurement conditions
Simple creation - simply select the analysis elements
Automated sample investigation after measurement

**Automatic Wavelength Selection System**
Fully automatic analysis wavelength selection
Automatic selection of the optimal wavelength for each measurement sample
Can also handle spectral interference

**Database calibration feature allows all-element calibration**
The ICPE-9000 is equipped with qualitative database calibration functionality based on a mixed sample of multiple elements. Perform all-element calibration simply and quickly.

**Qualitative Database Calibration**
All-element batch calibration
All elements calibrated simply and quickly

**Method Diagnosis Assistant**
In many multitype ICP spectrometers, measurement may be possible even without a pre-measurement evaluation of the analysis sample, but evaluation after measurement is extremely difficult. Depending on the sample, if a time-consuming evaluation is not carried out, accurate results may not be obtainable. The ICPE-9000 offers a key advantage over other spectrometers with its Method Diagnosis Assistant, which automates the troublesome work of evaluation, corrects incomplete methods, and determines accurate values through recalculation.

**Automation of post-measurement evaluation**
Easy method correction and recalculation

**ICPE-9000**
Multitype ICP Emission Spectrometer
Simplifying Measurement and Reducing Running Costs Utilizing Ideas for Maintaining Performance Stability

The ICPE-9000 is a high-performance high-throughput ICP, with all of the features required of an ICP emission spectrometer, including reduced running costs, highly stable performance, high sensitivity and low contamination. Shimadzu’s accumulated experience has been utilized to minimize error sources arising in

Echelle spectrometer and CCD detectors
High Throughput
A large-scale 1-inch CCD detector with a large number of elements has been adopted, together with an Echelle spectrometer, providing high-speed measurement. Measurements that would take five minutes or more with a sequential-type device are now completed in only a few minutes. In addition, evaluation and recalculation is simple, as all-element and all-wavelength data is acquired during measurement. If the Assistant is used, the evaluation is completed quickly and automatically.

Adopting a vacuum spectrometer
Eliminates the Need for Spectrometer Purge Gas
The ICPE-9000 utilizes a vacuum spectrometer, the first of its kind in an ICP emission spectrometer equipped with semiconductor detectors. A vacuum spectrometer does not require high-purity gas for internal gas purging. This reduces running costs since no gas other than the Argon used in the measurement is required.

Equipped with Mini Torch
Low Running Costs
The ICPE-9000’s mini torch reduces consumption of argon gas to half that of conventional torches. The mini torch’s automatic radio frequency power source tuning provides approximately the same sensitivity as a conventional torch.

Performance quality is maintained even during long-term measurements
Extremely Stable Vacuum Spectrometer
Spectrometer stability is extremely important for stable measurement over extended periods. Spectrometer temperature is controlled to a highly precise ± 0.1 degrees Celsius, and since no gas with an impact on thermal control is used, the unit demonstrates stable performance even during long-term analysis. In addition, since the vacuum spectrometer always maintains a vacuum, contamination does not occur. Even during long-term use, there is basically no reduction in sensitivity due to contamination.
each of the device’s components, from the light source ICP to the spectrometer and detectors. This ensures the ICPE-9000 is always stable, and measurements are always assured.

**Low noise, high sensitivity**

**Large-scale 1-inch CCD**

The ICPE-9000 is equipped with a large-scale 1-inch CCD. In multitype devices, semiconductor detectors with a large number of elements are indispensable for increasing resolution. However, with small-sized detectors, pixel size is reduced, which, in turn, reduces the amount of light captured by each pixel. With the ICPE-9000, a large-scale 1-inch CCD is used, eliminating this problem. In addition, in comparison with conventional semiconductor detectors, the ICPE-9000 runs at a relatively high cooling temperature (-15 degrees Celsius), which shortens the initial stabilization period and provides long-term stability.

**A vertical torch layout**

Minimizes Contamination and Blockages, Ensuring even High-concentration Samples are Safe

Standard ICP emission spectrometers with axial observation are not ideal for high-matrix samples. For this reason, options are used to reduce the quantity of sample introduced. Often, torch layout direction is the primary cause of contamination and blockages. With a radial-axis torch layout, gravity causes the sample to gradually fall while it moves through the torch, leading to adhesion to the walls, contamination and torch blockage.

With the ICPE-9000, a vertical torch orientation is used in order to solve these problems. As a result, even with high-matrix samples, contamination and torch blockages are minimized, ensuring stable measurement.
Easily Perform Analysis From the First Sample

Once measurement elements have been determined, measurement with the Multitype ICPE-9000 is simple with the system method.

Even if element selection is incorrect, recalculation without remeasurement is simple, due to the storage of all elemental data.

**Equipped with qualitative database calibration**

Sample Measurement is Simple Using High-Precision Qualitative Analysis

Measurement of completely new samples is simple, even if both elements and concentrations are not known. The elements present and their concentrations can be easily determined using the ICPE-9000’s all-element qualitative analysis method. With the ICPE-9000, the qualitative database can be calibrated quickly and easily, resulting in consistently accurate qualitative results. Further, the use of an automatic wavelength selection system ensures accurate qualitative results are obtained with negligible impact from spectral interference.

**ICPEsolution**

High-precision qualitative analysis

Qualitative results are highly reliable thanks to the automatic wavelength selection system and fast calibration of the all-element qualitative database.

Highly reliable qualitative results, even from actual samples
No need for time-consuming comparative examination with a standard sample.

**Soil Analysis (Conventional device)**

<table>
<thead>
<tr>
<th>Soil Analysis (Conventional device)</th>
<th>Soil Analysis (ICPE-9000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At &lt; 100</strong></td>
<td><strong>At &lt; 100</strong></td>
</tr>
<tr>
<td><strong>Fe &lt; 100</strong></td>
<td><strong>Fe &lt; 100</strong></td>
</tr>
<tr>
<td><strong>Cr 144</strong></td>
<td><strong>Cr 29</strong></td>
</tr>
<tr>
<td><strong>Fe 151</strong></td>
<td><strong>Fe 80</strong></td>
</tr>
<tr>
<td><strong>Pb 500</strong></td>
<td><strong>Pb &lt; 8</strong></td>
</tr>
</tbody>
</table>

With conventional ICP units, various elements are shown at incorrect values due to spectral interference from iron in the soil.

With the ICPE-9000, accurate values are shown due to wavelengths being unaffected by spectral interference from iron in the soil.
The Method Development Assistant generates measurement conditions based on the results of the all-element qualitative analysis. If elements are selected from the qualitative results listed, the optimal measurement wavelength and information about the calibration curve sample are automatically created.

If interference cannot be avoided, correction information including BG Correction and IEC is also automatically generated.

**Simple Element and Wavelength Selection Using the Method Development Assistant**
Statistical values are shown for each elemental concentration from the all-element qualitative results for the measurement sample. Simply by selecting the elements requiring measurement, the optimal wavelengths for each element’s concentration are automatically selected.

**Automatic Generation of Measurement Wavelengths and Calibration Samples**
The optimal measurement wavelength is automatically selected from the quantitative element concentration range. The Assistant also automatically generates the calibration sample.

**Automatically Creates Interference Correction Information**
The necessity of BG correction and IEC is evaluated from the quantitative element concentrations and the concentration of interference elements.

With sequential-type units, remeasurement is required, and measurement conditions must be checked a number of times prior to measurement. However, with the ICPE-9000, these measurements can all be done simply.
Easily Measure a Variety of Sample Types

Many samples have virtually no coexistent elements other than the elements to be measured, and wavelength selection is easy. However, when there are a large number of coexistent elements in addition to the elements to be measured, a variety of interference occurs. Typical wavelengths can no longer be used and wavelength examination is required. Furthermore, when concentrations are high and the amount of

Equipped with an automatic wavelength selection system
Simplified Wavelength Selection

With conventional instruments, measurement of multiple types of samples under a single measurement condition (wavelength) is very difficult. Typically, the measurement method involves selecting multiple wavelengths. However, when measurements are made at multiple wavelengths, measurement results are obtained equal to the number of selected wavelengths, which then require wavelength examination. With the ICPE-9000, only a single optimal measurement result is shown, regardless of the number of wavelengths registered. All elements included in the measurement sample are monitored, and interference from the various wavelengths of the measured elements is automatically evaluated. The optimal wavelength for measurement is automatically selected, thereby obtaining accurate measurement results.

Echelle spectrographic method compatible database
Accurate Automatic Wavelength Selection with an Exclusive Database

The ICPE-9000 is equipped with an exclusive interference database. Interference elements and interference amounts for all measurement wavelengths are stored in a database. This means that interference elements and their interference amounts can be evaluated using only measurement sample data. As a result, optimal wavelengths having no interference can be accurately and automatically selected.
interference is excessive, a high-resolution sequential-type device is required for accurate measurement. With the ICPE-9000, combining an automatic wavelength selection system with the IEC ensures accurate measurement is simple, even for samples requiring wavelength examination and even for samples with many matrix components that require a high-resolution sequential type unit.

**Method Diagnosis Assistant checks the causes of errors**

**Confirmation of Measurement Results is Easy**

With ICP emission spectrometers, measurement errors can have a number of causes, including physical interference, ionization interference and spectral interference. For this reason, a determination of whether or not the measurement results are truly the correct values is sometimes required. The ICPE-9000’s Method Diagnosis Assistant, however, evaluates the causes of errors for each measurement sample. The solution method is displayed so that the optimal method is used, based on the results of the diagnosis, allowing simple adjustment of the method.

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![Image](image.png)

**Method diagnosis results**

Methods are evaluated for each element and each sample. If there are differences from the analysis values, the problem point is indicated.

**Solution method**

Calibration information is added to the method simply by selecting the solution method in the sequence shown. Method is automatically modified.

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**The Method Diagnosis Assistant automatically generates IEC information**

**High-precision Measurement is Simple with IEC**

For samples with multiple matrix components, spectral interference occurs at all wavelengths, and accurate analysis may not be possible. For this type of sample, a high-resolution sequential-type analyzer has been the logical choice. The ICPE-9000, however, utilizes IEC to ensure accurate measurement. In general, IEC requires specialized knowledge for creating calibration curve samples and for calculating correction factors. However, with the ICPE-9000, only a single sample is required in order to add a calibration sample to the calibration curve sample. Further, if the Method Diagnosis Assistant is used, both correction information and calibration sample data are automatically created, allowing the simple implementation of IEC.
### Accessories, Options

Note) Purchase items individually for sample types without a part number (P/N)

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Item</th>
<th>Nebulizers</th>
<th>Sample Take-up Tubing</th>
<th>Chambers</th>
</tr>
</thead>
</table>
| Standard Set | Standard Accessories | Nebulizer, 10UES (P/N 046-00092-20)  
Designed for high-concentration samples, with high-efficiency nebulization.  
(Sample take-up rate approx. 1 ml/min) | Take-up tube ASSY, NFTS-075 (P/N 046-00092-18)  
For “10UES” and “07UES” nebulizers. | Cyclone chamber, HE (P/N 046-00093-02)  
Locking screw, 0152 (P/N 046-00093-02)  
Seal, 0237 (P/N 046-00093-92)  
These are included. |

| For Small Amounts of Samples | Nebulizer, 07UES (P/N 046-00092-21)  
A nebulizer with high-efficiency nebulization.  
(Sample take-up rate approx. 0.6 ml/min) | Take-up tube ASSY, NFTS-075 (P/N 046-00092-18)  
For “10UES” and “07UES” nebulizers. | Cyclone chamber, HE (P/N 046-00093-02)  
Locking screw, 0152 (P/N 046-00093-02)  
Seal, 0237 (P/N 046-00093-92)  
These are included. |

| High Salt Samples | Nebulizer, 10UES (P/N 046-00092-20)  
Sample take-up rate approx. 1 ml/min) | Take-up tube ASSY, NFTS-075 (P/N 046-00092-18)  
For “10UES” and “07UES” nebulizers. | Cyclone chamber, HE (P/N 046-00093-02)  
Locking screw, 0152 (P/N 046-00093-02)  
Seal, 0237 (P/N 046-00093-92)  
These are included. |

| Organic Solvent Samples | Nebulizer, 10UES (P/N 046-00092-20)  
Sample take-up rate approx. 1 ml/min) | Take-up tube ASSY, NFTS-075 (P/N 046-00092-18)  
For “10UES” and “07UES” nebulizers. | Chamber drain straight (P/N 211-84352-91)  
Nebulizer holder kit type 2 (P/N 211-48062)  
Includes organic solvent resistant O-rings. They are attached to each chamber other than the cyclone chamber, and are used to support nebulizers. |

| Organic Solvent Samples | Nebulizer, 10UES (P/N 046-00092-20)  
Sample take-up rate approx. 1 ml/min) | Take-up tube ASSY, NFTS-075 (P/N 046-00092-18)  
For “10UES” and “07UES” nebulizers. | Water-cooled chamber kit (P/N 211-4372)  
This increases injection efficiency of organic solvent samples by cooling the chamber and suppressing sample evaporation within the chamber.  
*Cooling water circulator is necessary. |

| Hydrofluoric acid sample injection system | Nebulizer, 10CPS (P/N 046-00092-14)  
Includes sample take-up tube. | Chamber ASSY (P/N 205-57778-02) |
|------------------------------------------|---------------------------------|---------------------------------|
| (P/N 211-42853-03) (Used for hydrofluoric acids) | PTFE Tube, 1.27 x 1500L  
(P/N 046-00092-03)  
Tube adaptor, 0735 (P/N 046-00092-10)  
These are included. | |
<table>
<thead>
<tr>
<th>Torches</th>
<th>Drains</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mini torch</strong> <em>(P/N 211-81448)</em></td>
<td><strong>Drain trap, 8214</strong> <em>(P/N 046-00093-01)</em></td>
<td><strong>Orifice ASSY L</strong> <em>(P/N 211-84532-91)</em></td>
</tr>
<tr>
<td><strong>Torch for high-concentration salt solution samples</strong> <em>(P/N 204-74323)</em></td>
<td><strong>Cyclone chamber Drain trap</strong> <em>(Indicated by “•”)</em></td>
<td><strong>Water bubbler</strong> <em>(P/N 204-19281)</em></td>
</tr>
<tr>
<td><strong>Torch</strong> <em>(P/N 204-70272)</em></td>
<td><strong>Connect pipe L</strong> <em>(P/N 211-85533)</em></td>
<td><strong>Please arrange the ICPE-9000 with Radial View Unit</strong> <em>(P/N 211-86000-93)</em></td>
</tr>
<tr>
<td><strong>Organic solvent torch</strong> <em>(P/N 204-77296)</em></td>
<td><strong>Ball joint clip</strong> <em>(P/N 210-15508-01)</em></td>
<td><strong>Extension pipe L</strong> <em>(P/N 211-85533)</em></td>
</tr>
<tr>
<td><strong>Demountable torch</strong> <em>(P/N 205-09627-01)</em></td>
<td><strong>Drain tube</strong> <em>(P/N 046-00093-01)</em></td>
<td><strong>Low-temperature thermostatic chamber NCB-1200 (SP) for water-cooled chambers</strong> <em>(P/N 044-01910-01)</em></td>
</tr>
<tr>
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<td><strong>Please arrange the ICPE-9000 with Radial View Unit</strong> <em>(P/N 211-86000-93)</em></td>
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<tr>
<td></td>
<td></td>
<td><strong>Extension pipe L</strong> <em>(P/N 211-85533)</em></td>
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<td></td>
<td><strong>Please arrange the ICPE-9000 with Radial View Unit</strong> <em>(P/N 211-86000-93)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Connect pipe HFS</strong> <em>(P/N 211-84175)</em></td>
</tr>
</tbody>
</table>
Peripheral Equipments (Options)

**Autosampler ASC-6100F**
(P/N 206-50100-30)  
(P/N 206-50100-39)
After placing the samples in the autosampler, sample names and analysis conditions can be set via a PC, and multiple samples can be continuously analyzed.

Size: W330 x D280 x H285mm
Power supply: Single-phase 100V ±10% 50/60Hz 1A (-30)

**Turntable cover**
(P/N 206-50295-01)

**Hydride Generator HVG-ICP**
(P/N 211-40981)
The elements within the sample are reduced and vaporized by the nascent hydrogen generated in the decomposition of sodium borohydride. Only the gas phase is injected into the plasma, providing high-sensitivity measurement.

Size: W333 x D210 x H195mm
Power supply: Single-phase 100V 50/60Hz  2A

**Ultrasonic Nebulizer UAG-1**
(P/N 205-09295)
This is a sample injection system developed for high-sensitivity ICP analysis. Unlike a standard nebulizer that uses negative carrier gas pressure, this nebulizer uses ultrasonic energy to nebulize a solution. Ultrasonic energy produces large amounts of extremely fine particles. This enables the ICPE-9000 to perform analyses at a sensitivity 10 times higher than conventional nebulizers.

Size: Main unit W320 x D380 x H159mm
Power supply: Single-phase 100V 50/60Hz  10A
* A cooling water system utility is required.

**Cooling Water Circulator CA-1114**
(P/N 044-01809-07)
Size: W340 x D384 x H851mm
Power supply: Single-phase 100V 50/60Hz  15A
* When only the main unit ICPE-9000 is connected, the stand cooling-water valve kit (P/N 211-86152-91) is needed.
* When the ultrasonic nebulizer UAG-1 is also connected, the stand cooling-water valve kit (in combination with UAG-1) (P/N 211-86152-92) is needed.

**Software PKG ICPE-9000(E)**
(P/N 211-44263-92)

**Tap Water Connection Kit**
(P/N 211-86153-91)
Required when tap water is used to cool the ICPE-9000.

**Hydrofluoric Acid Sample Injection System HFS-2**
(P/N 211-42853-03)
Samples composed primarily of silicates, such as rocks, soil, cement and ceramics, are insoluble or dissolve poorly even in strong acids. If hydrofluoric acid is used to dissolve these samples, normal glass injection systems cannot be used. A sample dissolved in hydrofluoric acid can be injected into the plasma directly by using an injection system made of fluorinated ethylene resin.

*For system design information, refer to pages 12 and 13.*
Specifications

<table>
<thead>
<tr>
<th>ICPE-9000 (P/N211-86000-92)</th>
<th>ICPE-9000 with radial view unit (P/N211-86000-93)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plasma Light Source</strong></td>
<td></td>
</tr>
<tr>
<td>Torch unit</td>
<td>Axial(ann)</td>
</tr>
<tr>
<td>Sample misting chamber</td>
<td>Cyclonic</td>
</tr>
<tr>
<td>Plasma torch</td>
<td>Either mini torch (standard accessory) or conventional torch can be used.</td>
</tr>
<tr>
<td>Nebulizer</td>
<td>Coaxial type</td>
</tr>
<tr>
<td><strong>Radio Frequency Generator</strong></td>
<td></td>
</tr>
<tr>
<td>Oscillator/Coil</td>
<td>Crystal oscillators</td>
</tr>
<tr>
<td>Maximum frequency output</td>
<td>1.6 kV</td>
</tr>
<tr>
<td>Output stability</td>
<td>Within ± 0.3%</td>
</tr>
<tr>
<td>Radio frequency circuit element</td>
<td>Transistor/Coil</td>
</tr>
<tr>
<td>Ignition method</td>
<td>Fully automatic</td>
</tr>
<tr>
<td>Load matching</td>
<td>Automatic matching</td>
</tr>
<tr>
<td><strong>Spectrometer Unit</strong></td>
<td></td>
</tr>
<tr>
<td>Optical system</td>
<td>Echelle spectrometer</td>
</tr>
<tr>
<td>Wavelength range</td>
<td>167nm to 800nm</td>
</tr>
<tr>
<td>Detector</td>
<td>CCD</td>
</tr>
<tr>
<td>Resolution</td>
<td>≤ 0.005nm @ 200nm</td>
</tr>
<tr>
<td>Vacuum ultraviolet compatibility</td>
<td>Vacuum spectrometer</td>
</tr>
<tr>
<td>Spectrometer temperature</td>
<td>With thermal control</td>
</tr>
</tbody>
</table>

Installation

1. **Installation Environment**
   - Temperature: 18 to 28°C (rate of temperature change: 2 degrees Celsius/h or lower)
   - Humidity: 20 to 70%
   - Avoid locations with high levels of vibration or dust.

2. **Power Source**
   - Main unit: Single-phase 200/220/230/240V ±10% (max 250V) 50/60Hz 30A
   - Data processor unit: Please refer to the manual
   - Options
     - Laser printer: Please refer to the manual
     - Autosampler ASC-6100F: Single-phase 100-240V ±10% 50/60Hz 1A
     - Ultrasonic nebulizer UAG-1: Single-phase 100V ±10% 50/60Hz 10A
     - Hydride generator HVG-ICP: Single-phase 100V ±10% 50/60Hz 2A
   - All of the above are grounded and require 3-prong sockets.
   - Check separately when using the cooling water circulator.

3. **Grounding**
   - Resistance: independent grounding below 30 ohms

4. **Gas Installation**
   - Type: Argon gas of 99.95% or greater purity
   - Adjust so that argon gas supply pressure is 450±10 kPa.
   - Approximately one 7-cubic meter gas cylinder is required per 8 hours of operation.
   - Consumption rate of argon gas used in analysis is 0.74 cubic meters/h with the standard specifications.

5. **Cooling Water**
   - Plasma stand cooling water: Water temperature 5 to 30°C flow rate 1L/min or more
   - CCD detector cooling water: Use Shimadzu’s recommended cooler
   - Note) UAG-1 requires separate cooling water supply.
   - Note) Cooling water circulator can also be used for plasma stand and UAG-1.

6. **Exhaust Duct**
   - Plasma stand and radio frequency power source exhaust duct
   - Exhaust gas from the plasma stand is primarily argon, however, be sure to install an exhaust duct, since this gas may also contain metallic vapors and solvents.

For details on other instruments, refer to the ICPE-9000 Installation Requirements Manual.

Software

- Wavelength automatic selection
- Automatic generation of coexistent element information
- Qualitative analysis
- Quantitative analysis Can also store data for entire wavelength range
- Accuracy control (optional)

External Dimensions

Unit: mm  Weight: 270kg

Installation Example

(ICPE-9000 and autosampler placed on a 1800 x 800 table)

Unit: mm