INSTRUCTION MANUAL

Solid Auto Sampler
MODEL ASC-120S

MITSUBISHI CHEMICAL ANALYTECH
EC DECLARATION OF CONFORMITY

We hereby declare that the following equipment complies with the essential requirements of:

Electrical Equipment Designed for Use within Certain Voltage Limits : 73/23/EEC

Model Name : Solid Auto Sample Changer Model ASC-120S

Standard to which Conformity is Declared:

EN55011 (1991) Class B
EN50082-1 (1997)
EN61010-1/A2 (1995)

Name of Manufacturer : MITSUBISHI CHEMICAL ANALYTECH CO., LTD

Manufacturer’s Address : 370, Enzo Chigasaki, Kanagawa, Japan

EU Office Address : Prinzenallee 13 40549 Duesseldorf Germany

Type of Equipment : Laboratory Equipment

Month and year of CE Marking : March, 1998

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Position : General Manager
Date : 29 Oct. 2003
DD.MMM.YYYY
INTRODUCTION

Thank you for your purchase of our solid auto sample changer Model ASC-120S. This sample changer is an option for our analyzer. By connecting the unit to our analyzer, 20 samples can be measured automatically at most. This instruction manual describes each part name, installation, operation, troubleshooting, and specifications. To use Model ASC-120S efficiently and safely, read this manual and understand functions and operation fully. Read instruction manuals of our analyzers, too. Appoint the operator at first for the safety use.

Analyzers (AQF-100 is included.)

Analyzers connected to ASC-120S are as follows.

<table>
<thead>
<tr>
<th>No.</th>
<th>Analyzer name</th>
<th>Model</th>
<th>Indication at system program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total Sulfur/Chlorine Analyzer</td>
<td>TOX-100</td>
<td>S-ASC</td>
</tr>
<tr>
<td></td>
<td>Total Organic Halogen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analyzer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Total Nitrogen Analyzer</td>
<td>TN-110</td>
<td>ASC-120S</td>
</tr>
<tr>
<td>3</td>
<td>Trace Sulfur Analyzer</td>
<td>TS-100</td>
<td>ASC-120S</td>
</tr>
<tr>
<td>4</td>
<td>Automatic Quick Furnace</td>
<td>AQF-100</td>
<td>ASC-120S</td>
</tr>
</tbody>
</table>

Table 1. Analyzers connected to ASC-120S

NOTICE

(1) Do not reprint this manual wholly or partially without permission.

(2) The contents may be changed without notice.

(3) Though this manual was prepared carefully, contact local distributors when mistakes, omissions, and missing pages are found. But system program screens in this manual may be different partially every version.

(4) For the influence of used result, we don’t take the responsibility regardless of (3).

(5) Decide operators when using this unit.

(6) Follow the contents in this manual. When troubles or damages occur by neglecting the contents in this manual, we do not guarantee the unit even within the term.

MITSUBISHI CHEMICAL ANALYTECH has the copyrights of this manual and the unit. Microsoft and Windows are Microsoft's registered trademarks. Other company and product names are their trademarks and registered trademarks.
IMPORTANT SAFEGUARDS AND PRECAUTIONS

Many thanks for your purchase of our Solid Auto Sample Changer Model ASC-120S. You should read this instruction manual with care before its use. Keep the manual at hand when you are operating the analyzer. It should be noted that if you operate the analyzer in the way other than described in the manual, the security can not be assured. If you find questions, errors, and omissions, contact our distributor.

WARNING
“WARNING” SHOWS DANGER OF DEATH AND SERIOUS INJURY CAUSED BY NEGLECTING “WARNING” AND HANDLING THE UNIT MISTAKENLY.

CAUTION
“CAUTION” SHOWS DANGER OF DAMAGES CAUSED BY HANDLING THE UNIT MISTAKENLY.

POINT
INFORMATION IMPORTANT FOR THE ACCURATE USE OF THE UNIT
At installation

**CAUTION**
Install the unit at the place where the temperature is 15°C~35°C. By installing it at immoderate temperature, a fire is caused and operation is unstable.

**CAUTION**
Install the unit in the place free from direct sunlight to prevent a fire.

**CAUTION**
Install the unit in the place free from strong vibration or continuous weak vibration to prevent operation instability.

**CAUTION**
Install the unit in the place free from strong electromagnetic field to prevent error operation.

**CAUTION**
Install the unit in the place where humidity is under 80% to prevent a fire and electric shock.

**CAUTION**
Install the unit in the place free from corrosive gas not to deteriorate the unit.

**CAUTION**
Install the unit in the place free from much dust to prevent a fire and electric shock.

**CAUTION**
Install the unit in the place where fire is not used to prevent a fire.

**CAUTION**
Install the unit horizontally.
At the unit use

WARNING
Check gas leak necessarily before using the unit. When organic matter mixes with oxygen or air at high temperature, explosive combustion can occur and glass part such as a pyrolysis tube and a guide tube is damaged.
To prevent explosive combustion, this unit vaporizes slowly sample in argon gas, mixes it with oxygen or air, and combust it. Before the use, check necessarily gas piping looseness, O-ring deterioration, and gas leak by septum removal.

WARNING
Do not expose directly the unit to combustibles and combustible gas.
A high temperature furnace is used for the unit. Combustible liquid causes a fire and is very dangerous.

CAUTION
Appoint a person responsible for the operation and operators.

CAUTION
Check gas flow and inject sample.

CAUTION
Do not touch high temperature part. The electric furnace is heated up to 800°C~1100°C. Do not open the door and touch it with naked hands.

CAUTION
Do not touch a power plug with wet hands to prevent an electric shock.

CAUTION
Do not remake and break a power cable. Do not load a heavy thing on the cable and heat it.
CAUTION
Do not remove the unit cover except our servicemen. An electric shock and a fire can be caused.

CAUTION
Check that a ground terminal is connected to prevent an electric shock.

CAUTION
When handling chemicals, put on the safety goggles or glasses to protect ear, skin, and eyes. Do not inhale chemicals vapor.

Maintenance and inspection

CAUTION
Check the unit every day before the use. If you fail to check it, it doesn't perform properly and serious accidents can be caused.
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Section 1: Names and Functions of Model ASC-120S

This section describes the names and functions of a solid auto sampler Model ASC-120S.

1-1. Names and functions of the front panel of Model ASC-120S

Illustration 1-1 shows the front view of Model ASC-120S and Table 1-1 shows the names and functions.

![Illustration 1-1. Front panel of Model ASC-120S]

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Indication</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power switch</td>
<td>POWER</td>
<td>ASC-120S power switch</td>
</tr>
<tr>
<td>2</td>
<td>Operation panel</td>
<td></td>
<td>Use it to set ASC-120S.</td>
</tr>
<tr>
<td>3</td>
<td>Elevator</td>
<td></td>
<td>Arm for moving sample boats</td>
</tr>
<tr>
<td>4</td>
<td>Turntable</td>
<td></td>
<td>Table for setting sample boats</td>
</tr>
<tr>
<td>5</td>
<td>Turntable cover</td>
<td></td>
<td>Acrylic cover for protecting sample boats</td>
</tr>
<tr>
<td>6</td>
<td>Cover for ABC maintenance</td>
<td></td>
<td>When connecting a ladle, a guide tube, an Ar/O2 gas line, open this cover</td>
</tr>
</tbody>
</table>

Table 1-1. Names and functions of Model ASC-120S front panel
1-2. Names and functions of the rear panel of Model ASC-120S

Illustration 1-2. shows the rear view of Model ASC-120S and Table 1-2. shows the names and functions.

Illustration 1-2. Rear panel of Model ASC-120S

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Indication</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ar/O₂ gas inlet</td>
<td>Ar/O₂ GAS IN</td>
<td>Connect Ar/O₂ line from an analyzer</td>
</tr>
<tr>
<td>2</td>
<td>Power connector</td>
<td>a.c. POWER</td>
<td>Use a standard power cable.</td>
</tr>
<tr>
<td>3</td>
<td>Ground terminal</td>
<td></td>
<td>For connecting an earth cable.</td>
</tr>
<tr>
<td>4</td>
<td>Fuse holder</td>
<td>FUSE</td>
<td>Use an appropriate fuse. AC 100/115V-5AT AC 230/240V-2.5AT</td>
</tr>
<tr>
<td>5</td>
<td>H/W test switch</td>
<td>FUNCTION</td>
<td>For function test (our servicemen)</td>
</tr>
<tr>
<td>6</td>
<td>Signal cable connection part</td>
<td>MAIN UNIT</td>
<td>For connecting ASC-120S to an analyzer Connect it by RS-232C (D-SUB 25 Pin/Straight Type)</td>
</tr>
<tr>
<td>7</td>
<td>Pyrolysis tube connection part</td>
<td></td>
<td>Connect a pyrolysis tube inserted into an analyzer.</td>
</tr>
</tbody>
</table>

Table 1-2. Names and functions of Model ASC-120S rear panel
1-3. ASC-120S operation panel

Illustration 1-3. shows Model ASC-120S operation panel and Table 1-3. shows the names and functions.

![Illustration of ASC-120S operation panel](image)

Illustration 1-3. ASC-120S operation panel

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Indication</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Escape key</td>
<td></td>
<td>For ending input conditions or settings</td>
</tr>
<tr>
<td>2</td>
<td>Enter key</td>
<td>ENT</td>
<td>For deciding inputted numbers</td>
</tr>
<tr>
<td>3</td>
<td>LCD</td>
<td></td>
<td>For displaying ASC-120S conditions and information</td>
</tr>
</tbody>
</table>
| 4   | LED           |            | AUTO: It is on during automatic measurement.  
               |               | O₂: It is on when O₂ flows in a pyrolysis tube.  
               |               | POWER: It is on when power is supplied.                                 |
| 5   | Up arrow key  |            | During setting: The cursor moves to the upper item.                    |
|     |               |            | During manual operation: An arm moves up.                               |
|     | Down arrow key|            | During setting: The cursor moves to the lower item.                    |
|     |               |            | During manual operation: An arm moves down.                             |
|     | Left arrow key|            | During setting: The cursor moves to the left item.                     |
|     |               |            | During manual operation: An arm turns left.                             |
|     | Right arrow key| →          | During setting: The cursor moves to the right item.                    |
|     |               |            | During manual operation: An arm turns right.                            |

Table 1-3. Names and functions of Model ASC-120S operation panel
Section 2: Packed Parts Check

Carefully unpack and inspect Model ASC-120S. If possible, store the cartons and all packing parts for the future use.

2-1. ASC-120S common parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Quantity</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ASC-120S unit</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Turntable for ASC-120S</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Turntable cover for ASC-120S</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ladle for ASC-120S</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Thermal insulator for ASC-120S</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Fixing board for ASC-120S</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Sample boat for ASC-120S (5pcs/set) ceramic</td>
<td>4 sets</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>φ 4/2 PTFE tube 0.5m</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>φ 4 Nut (with ferrule)</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Glass petri dish</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>RS-232C cable 25-pin, straight-type</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Power cable (AC 100/115V or 230/240V, 2m)</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2P-3P converting plug (115V only)</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Fuse, 5A or 2.5A</td>
<td>2 pcs/set</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>ASC-120S instruction manual</td>
<td>1 pc</td>
<td></td>
</tr>
</tbody>
</table>

Table 2-1. ASC-120S parts

2-2. Parts by analyzer

Parts by analyzer are as follows. Check the table of your analyzer.

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Quantity</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outer pyrolysis tube for TOX-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Inner pyrolysis tube for TOX-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Springs for a pyrolysis tube</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>φ 4/4 Connector (30-4U-C)*</td>
<td>1 pc</td>
<td></td>
</tr>
</tbody>
</table>

Table 2-2. Parts for TOX-100
Section 2: Packed Parts Check

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Quantity</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outer pyrolysis tube with nails for TN-110</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Catalyst filled)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Inner pyrolysis tube for TOX-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Springs for a pyrolysis tube</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(\phi\ 4/4) Connector (30-4U-C)*</td>
<td>1 pc</td>
<td></td>
</tr>
</tbody>
</table>

Table 2-3. Parts for TN-110/TOX-100+ND-100

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Quantity</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outer pyrolysis tube for TOX-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Inner pyrolysis tube for TS-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Springs for a pyrolysis tube</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(\phi\ 4/3) Connector (30-4RU3-C)*</td>
<td>1 pc</td>
<td></td>
</tr>
</tbody>
</table>

Table 2-4. Parts for TS-100

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Quantity</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outer pyrolysis tube for TSV</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Inner pyrolysis tube for AQF-100</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Springs for a pyrolysis tube</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(\phi\ 4/4) Connector (30-4U-C)*</td>
<td>1 pc</td>
<td></td>
</tr>
</tbody>
</table>

Table 2-5. Parts for AQF-100

* When connecting TS-100, change the line at the main unit side from \(\phi\ 3\) to \(\phi\ 4\) with a \(\phi\ 4/3\) connector (30-4RU3-C).

By connecting an attached \(\phi\ 4/4\) connector (30-4U-C) to the line from Ar/O\(_2\) gas of the main unit when connecting frequently another option (such as ABC and CRI-100H) to TOX-100 or TN-110 or TOX-100+ND-100 or AQF-100, connection is easier.

Use a nut and a ferrule to connect it with a \(\phi\ 4/2\) PTFE tube.

Illustration 2-1. Connection of a connector to Ar/O\(_2\) line
Section 3: Installation

3-1. Installation

Install the unit as the following conditions for the long-term stable use. Refer to IMPORTANT SAFEGUARDS AND PRECAUTIONS and precautions for the details.

- Room temperature is 15~35°C.
- Free from direct sunlight
- No strong vibration and continuous weak vibration
- No strong electromagnetic field
- The humidity is under 80%.
- No corrosive gas
- Free from much dust
- Fire must not be used.
- No flammable materials
- The horizontal surface for installation

Even within the guarantee term, we can't compensate the troubles or damages caused by neglecting the above conditions.
Section 3: Installation

3-2. Installation space

ASC-120S system size is as follows. Prepare the space of the following height and width plus the space for the instruction manual for an analyzer.

- ASC-120S size: Width 440mm × Depth 360mm × Height 430mm, weight about 20kg
- Prepare more than 150mm space between the unit and the back wall.

A personal computer and a printer are sometimes different from the following illustration by specifications.

Illustration 3-1. System installation
3-3. Power preparation

3-3-1. Power

ASC-120S power voltage is AC 100V〜240V. Consumption power is 150VA. Prepare 2 lines of power of over 20A in capacity. The voltage fluctuation range should be within ±10%. When it is over 10%, use a voltage stabilizer.

3-3-2. Grounding

The attached power cable is 3-line type including a grounding line. Insert a power cord into a 3-line type power outlet and ground it stably. If the power outlet is 2-line type, ground it necessarily from the earth terminal of a power cable or the unit left grounding terminal.

Wiring

The following diagram is a wiring example. Separate the distribution board for an analyzer (including an electric furnace) from the one for others.

![Diagram](image)

<table>
<thead>
<tr>
<th>Distribution board</th>
<th>Outlet</th>
<th>Designed consumption current</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 100/115/230/240V 50/60Hz</td>
<td>20A</td>
<td>For an analyzer (Max. 15A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a detector (0.2〜2A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a personal computer (6A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a monitor (1.4A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a printer (0.8A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For ASC-120S (1.5A)</td>
</tr>
</tbody>
</table>

By analyzer, attachments such as a detector (including an absorption unit) are different.

The cable length is as follows.

- Power cable for ASC-120S : 2m
3-4. Gas line

Prepare gas lines as follows.

- Prepare an \( \text{O}_2 \) line and an \( \text{Ar} \) line on the center of a table.
- Prepare an outer size \( \phi \) 3 metal line to connect a line to the unit.
- Prepare about 1m space at the end of a line to the unit.

When adjusting gas purity and gas pressure, refer to the instruction manual of the main unit.

3-4-1. Preparation for gas lines

Refer to the instruction manual for an analyzer for the gas line from a metal line on the center of a table to an analyzer. After ASC-120S assembly, connect gas lines. Refer to 3-5-4. Connection of ASC-120S gas line for details.

3-4-2. Gas evacuation

Sample gas after combustion is discharged from an analyzer (or a detector). Prepare a ventilating fan or a ventilation line from the gas outlet to the outside. For the gas outlet position, refer to the instruction manual for an analyzer.
3-5. Preparation for ASC-120S

3-5-1. Setting of ASC-120S

Assemble ASC-120S as follows.

(1) Remove a turntable cover.

(2) Remove a turntable.

(3) Open a maintenance cover for ABC.

By loosening 4 screws, the turntable position can be fine-tuned.

Illustration 3-2. Setting of ASC-120S
Section 3: Installation

(4) Insert a ladle into the pyrolysis tube setting part from a ladle iron core (part covered with glass).
Set the ladle so that the tip turns up.
At this time, check that the iron core overlaps with the position of the magnet holder at ABC side from ABC maintenance port.

Illustration 3-3. ASC-120S left side

(5) Close the cover for ABC maintenance cover.

(6) Set a turntable to ASC-120S.

**CAUTION**
When setting a turntable, take care not to touch the table to an arm.
Check that foreign matter is not adhered to the main unit table and the bottom of a center block.
If foreign matter is adhered, the table is inclined and an arm can’t catch a boat correctly.

(7) Close a turntable cover.
3-5-2. Fixing board setting

Connect a fixing board to ASC-120S as follows. Fix the board by inserting screws into the screw holes of the attached fixing board and the left side of ASC-120S and tightening them.

Illustration 3-4. Fixing board setting
Section 3: Installation

3-5-3. Connection of an analyzer and ASC-120S

Connect ASC-120S as follows.

1. Pass an O-ring holder through the right of a pyrolysis tube inserted into the analyzer.

2. Pass an O-ring by 1 cm position from the right.

3. Insert the O-ring into the left hole of ASC-120S not to distort it by rotating an inner pyrolysis tube.

4. Tighten the O-ring holder at the position where the branch tube of the pyrolysis tube is turned to the unit back and fix the tube.

5. Connect ASC-120S to the fixing board in the right of the analyzer and fix it with a knurled screw.

6. Put the thermal insulator on the fixing board. (by magnet)
   * When the thermal insulator is set to the right side of the analyzer, remove it.

---

Illustration 3-5. Connection of ASC-120S and an analyzer

**CAUTION**

After inserting a pyrolysis tube deeply, tighten an O-ring holder. By tightening it too tight, the pyrolysis tube can break.
3-5-4. Connection of ASC-120S gas line

The line connection of an analyzer, a pyrolysis tube, and ASC-120S is as follows.

* Refer to the instruction manual for an analyzer. (Line sizes and connector forms are different by an unit.)

(1) Set an O₂ gas line from GAS OUT of the analyzer rear panel to the branch tube of the pyrolysis tube with ① connector. (For AOF-100, an elbow-type connector is used.)

(2) Set Ar/O₂ gas line from GAS OUT of the analyzer rear panel to ② Ar/O₂ GAS IN with attached nuts with ferrules.

* When using TS-100 or replacing ASC-120S with ABC frequently, connect a 4/4 connector. Refer to Illustration 2-1. Connection of a connector to Ar/O₂ line for details.

Illustration 3-6. Connection of ASC-120S gas line
Section 3: Installation

3-6. Cable connection

3-6-1. Connection of a communication cable

Connect ASC-120S to the analyzer with a communication cable as follows.

(1) Connect OPTION 1 connector of the analyzer rear panel to MAIN UNIT connector of ASC-120S rear panel with a RS-232C cable (25-pin straight-type).

![Illustration 3-7. Connection of a communication cable]

3-6-2. Connection of ASC-120S power cable

Connect a power cable (2m) to a.c.POWER of ASC-120S rear panel.
For the connection of an analyzer power cable, refer to each instruction manual.

* For the connection of power cables of a personal computer and a printer, refer to each instruction manual.
Section 4: ASC-120S Function

This section describes Model ASC-120S functions.

4-1. Function type

ASC-120S functions are as follows.

(1) Automatic measurement function (Analysis)

Select it at ASC-120S hardware test.
For the automatic measurement by parameters set by the system program when ASC-120S is connected to the analyzer
Refer to the function for Section 5: Measurement.

CAUTION
Before automatic measurement, check measurement, combustion, and sample changer conditions. Inadequate conditions cause error operation and explosive combustion.

(2) Manual operation (H/W Test)

Select it at ASC-120S hardware test.
For setting operation program (turntable, ABC, arm, chuck, and sample boat prebaking) exclusively for ASC-120S and checking ASC-120S operation.

CAUTION
Use ASC-120S of conditions set by a serviceman in installation.

LCD indication

The sample boat number is displayed in ASC-120S LCD with #.

Ex. Sample boat No. 20 → Boat#20

Operation panel function

1 1 : For moving a cursor or an arm up and down
2 2 : For moving a cursor or an arm right and left
[ENT] key : For deciding or moving operation
[ESC] key : For cancellation or suspension, returning to the previous window
4-2. ASC-120S start

Start Model ASC-120S.

(1) Turn on ASC-120S power switch. “Initial Set” screen is displayed.

\[\text{**Initial Set**} \]
\[\ldots \text{Input [ESC]key=} \]

(2) By pressing [ESC] key, command waiting is canceled and the initial screen is displayed. ASC-120S checks the home position.

Initial screen is displayed.
Proceed to ASC-120S functions.

\[\text{**Menu**} \]
\[1. \text{Analysis} \]
\[2. \text{H/W Test} \]
\[3. ** ** \]

(3) To measure automatically, press [ENT] key when “1. Analysis” is selected. Command from the system program is waited.

\[\text{**Menu**} \]
\[1. \text{Analysis} \]
\[2. \text{H/W test} \]
\[3. ** ** \]


\[\text{*** Test Menu ***} \]
\[1. \text{Table} \]
\[2. \text{ABC} \]
\[3. \text{Arm} \]
\[4. \text{Chuck} \]
\[5. \text{Sample Inlet Cov} \]
\[6. \text{Sequence Run} \]
\[7. \text{Initial Home} \]
\[8. \text{Boat Prebake} \]

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Table</td>
<td>Operation test of the turntable</td>
</tr>
<tr>
<td>2</td>
<td>ABC</td>
<td>Operation test of ABC</td>
</tr>
<tr>
<td>3</td>
<td>Arm</td>
<td>Operation test of the arm</td>
</tr>
<tr>
<td>4</td>
<td>Chuck</td>
<td>Operation test of the chuck</td>
</tr>
<tr>
<td>5</td>
<td>Sample Inlet Cov</td>
<td>Operation test of the sample inlet box cover</td>
</tr>
<tr>
<td>6</td>
<td>Sequence Run</td>
<td>A series of the operation test</td>
</tr>
<tr>
<td>7</td>
<td>Initial Home</td>
<td>Resetting of each mechanical part to the initial position (home position)</td>
</tr>
<tr>
<td>8</td>
<td>Boat Prebake</td>
<td>Sample boat prebaking</td>
</tr>
</tbody>
</table>

Table 4-1. Test menu
4-3. H/W test

4-3-1. Table

(1) Display “Test Menu” screen.

(2) Press [ENT] key when “1. Table” is selected.

(3) Move a cursor to an item with ↑ and ↓ keys and press [ENT] key.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Home Position</td>
<td>The turntable turns to the home position (No.20).</td>
</tr>
<tr>
<td>2</td>
<td>1 Step</td>
<td>By pressing [ENT] key, the table is turned by 1 position.</td>
</tr>
</tbody>
</table>
| 3   | Continuous  | Continuous operation is run.  
Press [ESC] key to suspend operation.  
By pressing [ESC] key, operation is suspended and the condition display screen is displayed.  
Refer to “Sensor error is displayed in operation panel” in Section 6 : Troubleshooting for details.  
Run “Home Position” or “1. Step” to return the turntable to the home position. |

Table 4-2. Turntable operation test

(4) When the test is completed, press [ESC] key to return to “***Test Menu***” screen.
4-3-2. ABC

Run ABC operation test.

(1) Select “ABC” with  key and press [ENT] key. “**ABC**” screen is displayed.

(2) Move a cursor to an item with  and  keys and press [ENT] key.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Home Position</td>
<td>The ladle moves to the home position.</td>
</tr>
<tr>
<td>2</td>
<td>End Position</td>
<td>The ladle moves to the end position.</td>
</tr>
</tbody>
</table>
| 3   | Continuous     | For continuous operation  
Home position → End position → Home position  
Press [ESC] key to suspend operation.  
By pressing [ESC] key, operation is suspended and condition display screen is displayed.  
Refer to “Sensor error is displayed in operation panel” in Section 6: Troubleshooting for details.  
By running home positioning, return the ladle to the correct position. |

Table 4-3. ABC operation test

(3) When the test is completed, press [ESC] key to return to “***Test Menu***” screen.
4-3-3. Arm

**POINT**
When running “continuous” of the arm test, set a sample boat to the
turntable. Without the boat, the sensor error occurs and operation is
stopped. When the sensor error is displayed, press [ESC] key to
return to “**Arm**” screen and run the test again.

“**Arm**” screen is displayed.

(2) Move a cursor to an item with [ ] and [ ] keys
and press [ENT] key.
The specified operation test is run.
For “Up/Down” and “Left/Right”, a cursor is
decided and ▶ changes from flashing to lighting.
■ returns to flashing condition.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
</table>
| 1   | ↑↓: Up/Down| For arm up and down operation,
To raise the arm, continue to press [↑ ] key.
To lower the arm, continue to press [↓ ] key. |
| 2   | ←→: Left/Right| For arm right and left operation
For the left rotation, continue to press [← ] key.
For the right rotation, continue to press [→ ] key. |
| 3   | Continuous| A sample boat is put to the sample inlet box and returned to
the turntable again. A series of operation is run.
Details:
Arm lowering → Sample boat holding → Arm rise →
Arm left rotation → Arm lowering → Cover opening →
Sample boat putting → Arm rise → Cover opening and closing
→ Arm lowering → Sample boat holding → Arm rise → Cover
closing → Arm right rotation → Arm lowering → Sample boat
putting → Arm rise |

* * * Test Menu * * *
1. Table
2. ABC
3. Arm

* * * Arm * * * ( )

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>↑↓</td>
<td>: Up/Down</td>
<td></td>
</tr>
<tr>
<td>←→</td>
<td>: Left/Right</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

Table 4-4. Arm operation test

(3) When the test is completed, press [ESC] key to return to “***Test Menu***” screen.
4-3-4. Chuck


<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Open</td>
<td>For opening a chuck</td>
</tr>
<tr>
<td>2</td>
<td>Close</td>
<td>For closing a chuck</td>
</tr>
</tbody>
</table>

Table 4-5. Chuck operation test

(3) When the test is completed, press [ESC] key to return to “***Test Menu***” screen.
4-3-5. Sample Inlet Cover

(1) Select “5. Sample Inlet Cov” with \[ \downarrow \] key and press [ENT] key.
“*** Inlet Cover ***” screen is displayed.

(2) Move a cursor to an item with \[ \uparrow \] and \[ \downarrow \] keys and press [ENT] key.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Open</td>
<td>The cover of the sample inlet box is opened.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* After Sample Inlet Cov operation test, run Close &amp; Lock to close the cover.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(The cover is not closed by “Initial Home” of H/W Test.)</td>
</tr>
<tr>
<td>2</td>
<td>Close &amp; Lock</td>
<td>The cover is closed and locked.</td>
</tr>
</tbody>
</table>

Table 4-6. Sample Inlet Cov operation test

(3) When the test is completed, press [ESC] key to return to “*** Test Menu ***” screen.
4-3-6. Sequence Run

**POINT**
When running this test, set sample boats to the turntable.


2. Move a cursor to an item with [ ] and [ ] keys and press [ENT] key.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ABC Used</td>
<td>Sequence Run is run with all mechanical parts including ABC.</td>
</tr>
<tr>
<td>2</td>
<td>ABC Not Used</td>
<td>Sequence Run is run with mechanical parts without ABC.</td>
</tr>
</tbody>
</table>

*Table 4-7. Sequence Run operation test*

3. Input times with [ ] and [ ] keys.

Ex. Boat # 20 002 Time

1. The current position (No.) of a sample boat is displayed.

2. Specify the number from the next boat.
   Use #1 and #2 sample boats.

   Specified times of “Sequence Run” test is run.

5. After the test, press [ESC] key to return to “*** Test Menu ***” screen.
4-3-7. Initial Home

Use this function to return a driving part to the home position after hardware test.

(1) Select "7. Initial Home" with [↓] key and press [ENT] key. Home positioning starts immediately and a turntable, ABC, an arm, and a chuck return to home positions.

* When the cover of the sample inlet box is open, the error is displayed. Press [ESC] key, run Close & Lock of 4-3-5. Sample Inlet Cov, and run home positioning.

(2) The right screen is displayed during operation. When home positioning ends, the screen returns to "*** Test Menu ***".

* a waiting minute *
4-3-8. Boat Prebake

Sample boats can be prebaked by ASC-120S manual operation. Usually, boat prebaking is run from a personal computer with the system program.

**POINT**
Set sample boats to the turntable.
Check that the temperature of an electric furnace in an analyzer is high.


(2) Input the seconds of the stop at end position with [↑] and [↓] keys. 120 seconds is standard.

(3) Press [ENT] key.

(4) Input the number of the boats with [↓] and [↑] keys.

Ex. Boat # 20 002 Time

1. The current position (No.) of a sample boat is displayed.
2. At this setting, #1 and #2 sample boats are prebaked.

Boat prebaking is run.

(6) After boat prebaking, the screen returns to "**Menu**".
5-1. Measurement principle

Sample boats with samples are set to the turntable of ASC-120S. After an arm sets the boat to the sample inlet box, ABC moves the boat to a pyrolysis tube. Sample is heated and vaporized slowly in argon flow and it is combusted completely in oxygen flow. Samples are different by analyzer. Refer to each instruction manual for details. The example of gas flow when ASC-120S is connected to an analyzer is as follows.

* When TS-100 is used, Ar/O₂ is Ar line, O₂ is O₂ Main line, and another line is O₂ Sub line.

Illustration 5-1. Measurement principle
5-2. Preparation for measurement

5-2-1. Measurement preparation flow

Basic flow of measurement preparation is as follows.

- 5-2-2. Power and gas supply
- 5-2-3. Start
- 5-2-4. System Setup
- 5-2-5. Preference
- 5-2-6. Gas flow setting and gas leakage check
- 5-2-7. Heater
- 5-2-8. Ozonizer
- 5-2-9. Boat Prebake
5-2-2. Power and gas supply

(1) Open main valves of O₂ gas and Ar gas cylinders.

(2) Set the second pressures of a cylinder and a STOP valve to 0.3±0.1MPa or 0.4±0.1MPa with a reducing valve. (The setting of the second pressure is different by analyzer.)

(3) Supply power to the outlet on a table.

5-2-3. Start

(1) Turn on the following power switches.
   A power switch and a heater switch (The analyzer front panel)
   Other switches (such as an ozonizer and so on)

(2) Turn on the power switch of ASC-120S.
   "Initial Setting" screen is displayed.

(3) By pressing [ESC] key, command waiting is canceled and ** Menu ** screen is displayed.
   ASC-120S checks the home position.

   Procced to ASC-120S functions.

(4) Check that a cursor is in "1. Analysis" and press [ENT] key.
(5) Turn on the power switches of a personal computer, a monitor, and a printer.

(6) Start an analyzer system program.

1. The operation procedure is described here with “TOX-100”.
   If you use another analyzer, replace “TOX-100” with your analyzer name.
   Click “Programs”, “TOX-100 System”, and “TOX-100 System”.
   After “TOX-100 System Program” is displayed, TOX-100 window is displayed.

2. Input an analyzer model name into “Analyst ID”. Click [OK] button.

![Image of TOX-100 Analyst ID window]

The system main window is displayed.

**POINT**
To limit this software user for Product Liability, Analyst ID can be registered.
Refer to Registration and deletion of Analyst ID in the instruction manual for analyzers.
5-2-4. System Setup

Set “Accessory” and “Mode” in “System Setup” and start the communication with the main unit.

**POINT**
Run necessarily “System Setup” before measurement. When “System Setup” is completed, TOX-100 unit communication to system program starts. The icons of “Analysis Parameters”, “Heater”, “Ozonizer”, and “Boat Prebake” are effective and their operation can be run.

1) Press <F5> key or click “System” and “System Setup” in the menu of TOX-100 system program. “System Setup” window is displayed.

2) Click ▼ of “Accessory” to select “S-ASC” or “ASC-120S”.

3) Click ▼ of “Mode” to select it.

4) Some analyzers have the following item. Click ▼ to set them.
   - Titration Current (mA): Select titration current.
   - Balance: Select a balance marker.

   * By connecting a balance and setting the balance maker when weighing sample with the balance, sampling volume can be transferred to “Sample Size” in the method file.

   * Without a balance, select “NO USED”.

5) Click [Transmit] button.
“System Setup” is saved and “System Setup” window is closed. Analyzer system program starts to communicate with the analyzer.
5-2-5. Preference

Set the environment of analyzer system program and automatic operation. ASC-120S setting is described here.

**POINT**
Set “Preference” if necessary.

1. Click “System” and “Preference”. “Preference” window is displayed.
2. Click [Environment].
   Click ▼ of “Calibration-Degree of Polynomials” to select an approximate expression.
   * By presetting approximate expression, edit is easier after the automatic measurement of standard sample and sample by one method.
3. Click “Measurement” tab.
[ASC-When all measurement is finished.]
For setting the automatic operation after the automatic measurement with ASC-120S TN-110 and TS-100 have the following item.
[Change Sens. in Method.]
For using plural Sens. in one method, “Change Sens.” is added to “Target” of a method window.
4. Click “Acc.” or “Accessory” and set “Home Cool Time” to 0.
   “Home Cool Time” is for cooling a sample boat at home position (in a sample inlet box).
   For ASC-120S, sample boats at the turntable are used in order.
   By setting it to 0, one measurement time can be shortened.
5. Click [OK] button.
   “Preference” contents are saved and “Preference” is closed.
5-2-6. Gas flow setting and gas leakage check

Change gas at the personal computer side, adjust gas flow of an analyzer, and check gas leakage.
For gas flow and gas leakage check points in the analyzer side, refer to the instruction manual for an analyzer.

**CAUTION**
After turning on the power switch, more than 30 minutes is required to stabilize an analyzer flow sensor.
The flow can be checked in the “Status” of the main window.
After full time, check gas leakage.

**CAUTION**
Check gas leakage when the heater switch is off. By checking gas leakage when the switch is on, you can get burned.
When setting a gas flow meter for gas leakage check, a pyrolysis tube already can be hot. Take care not to get burned.

**CAUTION**
Do not clog the outlet of a pyrolysis tube. The tube breaks and you can get hurt.

**CAUTION**
If flow is under the set value, gas can leak. Stop the unit use immediately and check gas leakage.
Section 5: Measurement

(1) Replace the ball joint of a pyrolysis tube outlet with one of a flow meter (option) for gas leakage check.

(2) Check the flow meter value is within the specified value set by the instruction manual for an analyzer.

(3) If the value is under the set flow, refer to Illustration 5-2 and check gas leakage.

(4) Recover gas leakage points and run (2) again.

Illustration 5-2. Gas leakage check points
5-2-7. Heater

**POINT**
Turn on an analyzer heater switch and click “On” and [OK] button in “Heater” window.
Before the temperature reaches the set temperature and the heater is stable, more than 60 minutes is required.

(1) Click 
or click “System” and “Heater”. “Heater” window is displayed.

(2) Click “On”.

(3) Click [OK] button.
The temperature starts to rise.
“Heater” window is closed and 
(blue) changes to 
(red).

5-2-8. Ozonizer

Some analyzers have an ozonizer.

**POINT**
Start an ozonizer necessarily when oxygen flows.
Before the ozonizer is stable, about 30 minutes is required.

(1) Click 
or “System” or “Ozonizer”. “Ozonizer” window is displayed.

(2) Click “On”.

(3) Click [OK] button.
Ozone generates.
“Ozonizer” window is closed and the shortcut button changes to 
(yellow).
5-2-9. Boat Prebake

(1) Click or click “Run” and “Boat Prebake”. “Boat Prebake” window is displayed.

(2) Input “Number of times”.

(3) Set sample boats to a turntable.

(4) Click [Next] button. The following window is displayed.

* By clicking [ABC Programs] button, ABC program can be checked.

(5) Click [OK] button. “Boat Prebake” window is closed.

(6) Click [Start] or press <Enter> key. Boat prebaking starts.
Prebaking of ASC-120S sample boats (Operation panel)

(7) 1 prebaking requires about 4~5 minutes and set times are repeated automatically. “Boat Prebake” is indicated in “Analysis Status”.

“Ready” in [Status] changes to “Busy” and ASC-120S waits for the communication from the system program.

The home position is checked.
It is No. 20 of the turntable.

By clicking , current operation is displayed.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Indication</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Table No.</td>
<td>1~20</td>
<td>The number (turntable No.) of a sample boat during measurement is displayed.</td>
</tr>
<tr>
<td>2</td>
<td>Sample Box</td>
<td>Close</td>
<td>The opening and closing of the sample inlet box cover is displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Elevator</td>
<td>Up</td>
<td>The up and down operation and stop position of the chuck is displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sample Box</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn Table</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Arm</td>
<td>Sample Box</td>
<td>The left and right position of the chuck is displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn Table</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Chuck</td>
<td>Close</td>
<td>The opening and closing of the chuck to grip sample boats are displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open</td>
<td></td>
</tr>
</tbody>
</table>

Table 5-1. Operation display of ASC-120S system program
(8) The turntable rotates.

| ABC: Home  | Table: Step              |
| Arm: Home  | (1/20)                   |
| Chuck: Close|                          |
| Cover: Close|                          |

(9) The chuck opens and the arm lowers.

| ABC: Home  | Table: Step              |
| Arm:       | (1/20)                   |
| Chuck: Open|                          |
| Cover: Close|                         |

(10) The arm lowers to the sample boat position.

| ABC: Home  | Table: Step              |
| Arm: End   | (1/20)                   |
| Chuck: Close|                         |
| Cover: Close|                          |

(11) The chuck grips a sample boat. The arm rises.

| ABC: Home  | Table: Step              |
| Arm:       | (1/20)                   |
| Chuck: Open|                          |
| Cover: Close|                          |

(12) It rises to the home position.

| ABC: Home  | Table: Step              |
| Arm: Home  | (1/20)                   |
| Chuck: Open|                          |
| Cover: Close|                          |

(13) It moves to the sample inlet box.

| ABC: Home  | Table: Step              |
| Arm:       | (1/20)                   |
| Chuck: Open|                          |
| Cover: Close|                          |

(14) It lowers to the box. The cover opens.

| ABC: Home  | Table: Step              |
| Arm:       | (1/20)                   |
| Chuck: Open|                          |
| Cover: Open|                          |

(15) It lowers to End in the box and releases the boat.

| ABC: Home  | Table: Step              |
| Arm: End   | (1/20)                   |
| Chuck: Open|                          |
| Cover: Open|                          |

(16) It rises.

| ABC: Home  | Table: Step              |
| Arm:       | (1/20)                   |
| Chuck: Open|                          |
| Cover: Open|                          |
(17) It rises to the home position.

(18) The chuck closes. The box cover closes.

(19) The boat moves to End position.
It stops at the position for 180 seconds.
180 seconds is the initial value.

(20) It moves to Cooling position.
It stops at the position for 120 seconds.
(By setting the value to 0, prebaking time can be shortened. Refer to 5-2-5. Preference for details.)

(21) It moves to the home position.

(22) The arm opens and lowers.
The box cover opens.

(23) The chuck grips the boat.

(24) The arm rises.

(25) It rises to the home position.

(26) It moves to the turntable.
The box cover closes.
(27) It lowers to the boat position. The chuck opens and the boat is returned to No.1 of the table.

(28) It rises.

(29) It returns to the home position and the chuck closes. ASC-120S is ready.

(30) Repeat (8)~(29) by the number of set sample boats.

---

* * * Analysis * * *
Command Waiting...

(esc) key＝
5-3. Automatic measurement

5-3-1. Automatic measurement flow

Measurement process is as follows.

New method

Existing method

Edit is necessary.

Edit is unnecessary.

```
“File”-“New Method”  →  Method name registration  →  Method edit  →  Measurement start (Data ID registration)  →  Standard sample Measurement  →  Measurement end

“File”-“Open Method”  →  Method file selection  →  Method edit during measurement (If necessary)  →  Analysis parameters edit during measurement (If necessary)  →  Measurement result edit (If necessary)

“Run”-“Method”
```

End
5-3-2. Method edit

Edit the method for automatic measurement. ASC-120S setting when preparing and editing a new method is described here.
* By opening an existing method, it can be edited.

(1) Click \[\text{ }\] or click “File” and “New Method”. “New Method” window is displayed. Accessory and Mode set at “System Setup” are displayed.

(2) Click \[\downarrow\] of “Accessory” to select “S-ASC” or “ASC-120S”.

(3) Click \[\downarrow\] of “Mode” to select it. The type of measurement modes is different by an analyzer.

(4) Click “Folder 1” or “Folder 2” of “Folder” to select a folder for saving method files.

(5) Input a method name into “Method Name”. (Up to 20 characters)
(6) Click [OK] button. The method edit window is displayed.

* Window contents are different by an analyzer.
  For method contents, refer to the instruction manual for an analyzer.
  Only the setting when using ASC-120S is described here.

![New Method Edit Window](image)

(7) Click ▼ of “Type” to select “Sample”.
  For solid sample, put a sample to a sample boat and weigh it.
  Input sample volume into “Sample Size” and set the unit to “mg”.

* By clicking [balance] button when an analyzer is connected to a balance,
  sample volume is inputted automatically from the balance.
  The following operation is required previously.

**POINT**

When a balance is connected.

① Place the boat on the balance and clear the tare.
② Put a sample into the boat.
③ Press the balance key (Such as <Print> key or foot switch) and transfer the weight into an analyzer.

Caution: Set necessarily the balance unit to “g”.
In the system program side, change it to “mg” at the input.
By setting it to “mg” at the balance side, it can be mistakenly regarded as “g” in the system program side.
(8) Edit contents by “Target” and set ABC Program No. by sample volume.

**CAUTION**

When ASC-120S is used, standard sample volume should be under 30mg or 50 µl. Too much samples can cause incomplete combustion.

(9) Click of ABC Program No. right. “ABC Programs” window is displayed.
* When program No. is known, input it directly into “ABC Program No.”
  Proceed to (12).

(10) Click ABC program to select it.

(11) Click [OK] button. Method edit window returns.

Selected program No. is displayed in “ABC Program No.”.

(12) Click [Add] button by measurement times. The same measurement contents are added into the below list by clicked times.

When using AQF-100, [Accumulate] button is displayed.
By clicking [Accumulate] button, combusted sample gas is absorbed into the same number tube. After the last sample of the same number tube is absorbed, absorption solvent is injected into an ion chromatography unit.
(13) Like other measurement settings, add them into the list by (7)~(12).

* For each setting addition and deletion, refer to the instruction manual for an analyzer.
* For TN-110 and TS-100, plural Sens. can be used in one method.
  Refer to “Change Sens. during method measurement” for details.

(14) To start measurement when method edit is completed, click [Run Method] button. “Method” window is displayed. Next, proceed to 5-3-3. Automatic measurement start.

**Change Sens. during method measurement**

For TN-110 or TS-100, plural Sens. can be used in one method.

**POINT**
Set Sens. at standard sample measurement and at sample measurement to the same setting.
When Sens. settings are different, the factor of prepared calibration can’t be used.

(1) Click “System”, “Preference”, “Measurement” tab.
  Check [Change Sens. in Method.] and click [OK] button.
  (“Change Sens” is added to “Target” of the method edit window.)

(2) Open the method edit window and click “Change Sens” of “Target”.
  “Change Sens” edit window is displayed.

(3) Select Ultra or High or Middle or Low from “Change Sens”.
  Set it in order from a low-concentration sample.

(4) Click [Add] button. The changed contents of “Sens.” are displayed in the window bottom.

(5) Select “Target” and prepare the method of measurement by “Sens.” set at (3).
  When changing “Sens.” again, repeat (2)~(4).
5-3-3. Automatic measurement start

Register Data ID and start measurement.

**POINT**
By using existing methods, measurement can start without method edit. By selecting “Run” and “Method”, [Method] window is displayed. But, click ▼ of “Method” to select a method.

(1) Input Data ID into “Data ID”. (Within 20 characters)
Measurement data can be printed and recalculated by this Data ID.

* As initial setting, “TSXC + measurement dominical year and date + serial number” (Example: TSXC20030421.001) is displayed in Data ID. But this can be changed.

* For some analyzers, when “Change Sens.” is set, a new Data ID is added to measurement data after Sens. change. Added indication is added to the main window top. (Original Data ID + serial number Example: TS20000731.001_1)

(2) Click [Run] button. The main window returns.
“S-ASC Home Moving” or “ASC-120S Home Moving” is displayed.

* For some analyzers, blank values and calibration factors can be inputted manually.
Input manually after this operation.

* For some analyzers, when setting “Change Sens.” in the first line of a method, “Sens. is changing. Click start.” is displayed. Click [OK] button.

After a while, measurement is ready.
5-3-4. Automatic measurement

Measurement contents set by a method are displayed in “Analysis Status.” Check the display and run measurement.

![Image showing analysis status and graph]

(1) When the unit is stable and measurement is ready, red “Ready” is displayed in “Status” and [Start] button flickers.

<table>
<thead>
<tr>
<th>Status</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready</td>
<td>Measurement is ready.</td>
</tr>
<tr>
<td>Wait</td>
<td>Waiting before peak detection after measurement start</td>
</tr>
<tr>
<td>Sampling</td>
<td>During signal processing</td>
</tr>
<tr>
<td>End</td>
<td>Measurement end</td>
</tr>
<tr>
<td>Busy</td>
<td>Measurement is unready or ASC-120S is unready</td>
</tr>
</tbody>
</table>

**POINT**

By clicking ASC-120S condition can be checked. Red part is a sample boat position.

(2) Set sample to a turntable.

When measuring a liquid sample

1. Prepare empty boats from No. 1 and set a turntable previously.
2. Take a standard sample of the volume set by a method to a microsyringe.
3. After injecting the standard sample with the syringe, click [Start] button or press [Enter] key. Measurement starts and a peak is displayed in a graph.

ASC-120S operation and operation panel indication are same as those of sample boat prebaking.
When measuring a solid sample (Do ① and ② at method edit.)

Put a sample into a sample boat and weigh it. Input sample weight into “Sample Size” and click ▼ of the right to set the unit to “mg”.

① Put a prebaked boat to the balance and weigh a solid sample.

② Input the sample weight into “Sample Size”. (Refer to 5-3-2, Method edit.)

③ Set sample boats to the turntable in the order set by method.

④ After sample setting, click [Start] button or press [Enter] key. Measurement starts and a peak is displayed in a graph.

ASC-120S operation and operation panel indication are same as those of sample boat prebaking.

(3) When measurement is completed, the result (Area) is displayed in “Analysis Status”.

When sample boat cooling time set at “Home Cool Time” of “Preference” window passes and measurement is ready, “Ready” is displayed in “Status” and [Start] button flickers. Refer to 5-2-5. Preference for the details.

(4) Measurement after No.2

For a liquid sample

When the cover of a sample inlet box is open, inject standard sample to the next sample boat in the turntable.

* Measurement after No.2 is repeated automatically. Therefore, method addition whenever measurement finishes is convenient. After method is added, repeat (2) and (3).

To add method, click Result Table or Method to display “Results Table” window. After clicking [Open Method] button and adding methods, click [Run Method] button. Refer to the instruction manual for an analyzer for details.

For a solid sample

For measurement after No.2, (2) and (3) are repeated automatically.

(5) After all measurements, “Completed” is displayed in “Analysis Status”.

(6) After method measurement, click or click “Run”, “Operation”, and “Exit Run”. Measurement ends.

* Measurement can be suspended.
Measurement suspension

Click 🡀 or click "System" and "Accessory" to display "Accessory" window.
By clicking [Pause] button, measurement can be suspended.
To resume measurement, click [Start] button.

By suspending measurement, analysis parameters and methods can be changed.

When a trouble occurs during measurement.

**CAUTION**

When a trouble occurs during measurement, click 🡀 to stop the system urgently.

Take measures against emergent stop causes and check that the unit is not wrong.
Measurement can't be continued, so measure again with the same method.
5-3-5. Method edit during measurement

By editing methods during measurement, measurement can be added and deleted.

(1) Click [Accessory] or click “System” and “Accessory”. “Accessory” window is displayed.

(2) Click [Pause] button. After the current measurement completes, the unit stops without the next measurement.

(3) Click [Close] button. The main window returns.

(4) Click [Results Table] or [Method]. "Results Table" is displayed.

(5) Click [Open Method] button. The method edit window is displayed.

(6) Add and delete methods by the same procedure as method preparation.
   * Measured methods can’t be deleted.

(7) Click [Run Method] button in the method edit window.

(8) Click [Close] button in “Results Table” window.

(9) To resume measurement, click [Start] button.
5-3-6. Exit

After measurement, stop the unit and exit program as follows.

**Personal computer side**

1. Communication disconnection
2. Program exit
3. Personal computer exit

**Unit side**

1. Unit stop
2. Analyzer stop

1. Communication disconnection
   - Press <F5> key while pressing <Shift> key or click “File” and “Disconnect”.
   - The heater switch of the system program, an ozonizer switch, and a titration current switch are off and the communication to an analyzer is disconnected.

   * When AQF-100 is used, turn off WS-100 power switch previously.

2. Unit stop
   - Turn off the following switches.
     - Power switch in the ASC-120S right side
     - Another accessory power switches

3. Program exit
   - Click [X] of the main window upper right or click “File” and “Exit”.
   - The analyzer system program is ended.

4. Personal computer exit
   1. Click [Start] button of a taskbar.
   2. Click “Shut Down”. Windows end page is indicated. Shut down Windows.
   3. Confirm “Shut down the computer?” is selected and click [Yes] button.
      - The computer power is off.
   4. Turn off the power switches of a printer and a monitor.

5. Analyzer stop

   **POINT**
   - The electric furnace must be cooled with a cooling fan.
   - After more than 30 minutes from communication disconnection, stop an analyzer.

   1. Turn off the power switch of the analyzer front panel.
   2. Close Ar and O₂ gas valves.
   3. To prevent the contamination of sample boats, keep them in a petri dish with tweezers.
Section 6: Troubleshooting

Countermeasures against hardware or software troubles in ASC-120S and system program use are described in this section.

**CAUTION**
When checking the power, pay attention to safety.

### No power to ASC-120S

<table>
<thead>
<tr>
<th>Point</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the power switch of ASC-120S ON?</td>
<td>Turn on the power switch.</td>
</tr>
<tr>
<td>Is the power connector in the rear of ASC-120S connected?</td>
<td>Connect the power connector firmly.</td>
</tr>
<tr>
<td>Is the power plug put in the outlet?</td>
<td>Connect the power plug firmly.</td>
</tr>
<tr>
<td>Is the power supplied to the outlet of the laboratory table?</td>
<td>Supply it.</td>
</tr>
<tr>
<td>Is ASC-120S power fuse broken?</td>
<td>(1) Take off the fuse holder of the rear panel with a screwdriver.</td>
</tr>
<tr>
<td></td>
<td>(2) Check the conduction with a tester.</td>
</tr>
<tr>
<td></td>
<td>(3) If a fuse is blown out, replace it with new one.</td>
</tr>
</tbody>
</table>

### Measurement does not start even by connecting ASC-120S to an analyzer.

<table>
<thead>
<tr>
<th>Point</th>
<th>Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the power switch of ASC-120S side ON?</td>
<td>Turn on the power switch.</td>
</tr>
<tr>
<td>Is the communication cable to an analyzer disconnected?</td>
<td>Insert firmly the signal connector of ASC-120S rear. Insert firmly the option connector of the analyzer rear.</td>
</tr>
<tr>
<td>Is “System Setup” run from a personal computer?</td>
<td>Check the system setting by the following procedure.</td>
</tr>
<tr>
<td></td>
<td>(1) When the main window of the analyzer system program is displayed, press &lt;F5&gt; key. “System Setup” dialog box is displayed.</td>
</tr>
<tr>
<td></td>
<td>(2) Click ▼ of “Accessory” to select “S-ASC” or “ASC-120S”.</td>
</tr>
<tr>
<td></td>
<td>(3) Click [Transmit] button.</td>
</tr>
<tr>
<td>Is ASC-120S operation panel AUTO?</td>
<td>When ASC-120S operation panel is “Command Waiting”, automatic measurement is available. For operation panel setting, refer to 5-2-3. Start.</td>
</tr>
</tbody>
</table>
Sensor error is displayed in the operation panel.

When the sensor error is displayed in the operation panel, restart ASC-120S. If it is still displayed even after the restart, mechanism can be damaged. Contact our local distributors.

Restart procedure

1. Turn off ASC-120S power switch.
2. Turn on ASC-120S power switch.
4. Check that the sensor error is not displayed.

Sensor error indication

| Table : 11 | Cover : 11 |
| ABC : 11 | Copen : 1 |
| Arm : 11111 | |
| Chuck : 1 | (esc) key=■ |

When the sensor is wrong, the indication of a wrong place is “0”. When the sensor is normal, the indication is “1”.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Contents</th>
<th>Sensor No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table: 11</td>
<td>Home sensor</td>
<td>S8</td>
</tr>
<tr>
<td></td>
<td>Step sensor</td>
<td>S9</td>
</tr>
<tr>
<td>ABC: 11</td>
<td>Home sensor</td>
<td>S1</td>
</tr>
<tr>
<td></td>
<td>End Limit (Over Run) sensor</td>
<td>S2</td>
</tr>
<tr>
<td>Arm: 11111</td>
<td>Elv. Home sensor</td>
<td>S3</td>
</tr>
<tr>
<td></td>
<td>Elv. Down (turntable side) sensor</td>
<td>S4</td>
</tr>
<tr>
<td></td>
<td>Elv. Down (sample inlet box side) sensor</td>
<td>S5</td>
</tr>
<tr>
<td></td>
<td>Arm Home sensor</td>
<td>S6</td>
</tr>
<tr>
<td></td>
<td>Arm Limit sensor</td>
<td>S7</td>
</tr>
<tr>
<td>Chuck: 1</td>
<td>Boat chuck sensor</td>
<td>S12</td>
</tr>
<tr>
<td>Cover: 11</td>
<td>Sample inlet box close sensor</td>
<td>S10</td>
</tr>
<tr>
<td></td>
<td>Sample inlet box open sensor</td>
<td>S11</td>
</tr>
<tr>
<td>Copen: 1</td>
<td>Protective cover sensor</td>
<td>(It is not used at present. “1” is displayed.)</td>
</tr>
</tbody>
</table>

6-2
This section describes warnings and error messages displayed in a monitor when troubles occur.

**CAUTION**
Danger and Warning displayed in a personal computer monitor show the danger of serious accidents. When this message is displayed, cope with the trouble immediately.

---

*ASC-120S error messages are as follows.*

<table>
<thead>
<tr>
<th>ERROR No.</th>
<th>Error messages</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>ASC-120S CABLE CONNECTION ERROR</td>
<td>The cable between an analyzer and ASC-120S is not connected. Connect it and restart the system.</td>
</tr>
<tr>
<td>203</td>
<td>ABC SENSOR ERROR</td>
<td>The sensor position is unknown or the sensor is broken at power supply. Contact our local distributors.</td>
</tr>
<tr>
<td>209</td>
<td>SAMPLE BOX OPEN/CLOSE ERROR</td>
<td>The cover of a sample inlet box can’t be opened and closed. Contact our local distributors.</td>
</tr>
<tr>
<td>211</td>
<td>CHUCK ERROR</td>
<td>A sample boat can’t be griped or it was fallen. Collect it and restart the system.</td>
</tr>
<tr>
<td>212</td>
<td>AC POWER SUPPLY ERROR</td>
<td>The voltage is wrong. Contact our local distributors.</td>
</tr>
<tr>
<td>213</td>
<td>ARM UP/DOWN ERROR</td>
<td>Arm up and down operations are wrong. Contact our local distributors.</td>
</tr>
<tr>
<td>214</td>
<td>ARM TURN ERROR</td>
<td>Arm turn is wrong. Contact our local distributors.</td>
</tr>
<tr>
<td>215</td>
<td>DIP SWITCH ERROR</td>
<td>Dip switch setting is wrong. Contact our local distributors.</td>
</tr>
<tr>
<td>216</td>
<td>H/W TEST ERROR</td>
<td>Telegram is received during the hardware test.</td>
</tr>
<tr>
<td>217</td>
<td>COVER OPEN ERROR</td>
<td>The protective cover is removed. Close the cover and the restart system. (It is not used at present.)</td>
</tr>
<tr>
<td>218</td>
<td>ABC PARAMETER ERROR</td>
<td>ABC parameters are inappropriate. Check them.</td>
</tr>
<tr>
<td>219</td>
<td>TABLE SENSOR ERROR</td>
<td>The table position can’t be determined. Contact our local distributors.</td>
</tr>
<tr>
<td>220</td>
<td>SENSOR ERROR</td>
<td>The sample boat position can’t be determined. Contact our local distributors.</td>
</tr>
</tbody>
</table>

Table 7-1. Error messages
Section 8: Maintenance and Inspection

8-1. Unit Inspection

**CAUTION**
Check the unit every day before use. If you fail to check it, it doesn’t perform properly and serious accidents can occur.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unit cleaning</td>
<td>Clean the unit if necessary.</td>
</tr>
<tr>
<td>2</td>
<td>Gas leakage check</td>
<td>Check the leakage of O₂ and Ar gases with the flow meter for gas leakage check.</td>
</tr>
<tr>
<td>3</td>
<td>Sample boat contamination check</td>
<td>Check that sample boat is not contaminated and devitrified.</td>
</tr>
<tr>
<td>4</td>
<td>Check of the packing of a sample inlet box</td>
<td>If it is contaminated and broken, change it with new one.</td>
</tr>
</tbody>
</table>

*Table 8-1. Items of daily inspection*

**Gas leakage check**

Check no leakage of supply gas (O₂ and Ar). Refer to 5-2-6. Gas flow setting and gas leakage check for details.

1. Connect the ball joint of the flow meter to the outlet of a pyrolysis tube.

2. Check the set gas flow and the indicated value of the flow meter.
Sample boat contamination check

**CAUTION** (When using an optional sample boat (quartz glass))
Sample boat devitrification deteriorates mechanical strength and causes the breakage. White discoloration of a sample boat is devitrification. When devitrification is severe and fine cracks are in devitrified part, mechanical strength is low. Change the tube immediately.

*Check of the packing of a sample introduction box*

If it is contaminated and broken, change it with new one.

1. Display the test menu by referring to 4-2. ASC-120S start. Open the cover of a sample inlet box by referring to 4-3-5. Sample Inlet Cov.
2. Put 4 attached spacers (PTFE tube) to the slot of a sample inlet box.
3. Turn a packing slot to the bottom. Cover spacers with packing and push the packing into the slot with a finger.

![Enlarged illustration of the cross section](attachment:image.png)

**Illustration 8-1. Setting of packing**
8-2. Keeping of ASC-120S

If you don’t use ASC-120S for one month or more, keep it under the following conditions.

Cautions in keeping the unit set at a table
- Disconnect a power cable and a gas line.
- Remove the cable to an analyzer.
- Remove ASC-120S from an analyzer.

Cautions about a keeping place
- Room temperature should be under 45°C.
- Free from direct sunlight
- Free from strong vibration and slight continuous vibration
- Free from strong electromagnetic field
- Humidity should be under 80%.
- Free from corrosive gas
- No fire
- Free from much dust
### Section 9: Specifications

<table>
<thead>
<tr>
<th>Name</th>
<th>Solid Auto Sampler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>ASC-120S</td>
</tr>
<tr>
<td>Sample</td>
<td>Solid samples and nonvolatile liquid samples</td>
</tr>
<tr>
<td>Sample volume</td>
<td>Under 30mg</td>
</tr>
<tr>
<td>Sample boat number</td>
<td>Up to 20 pcs</td>
</tr>
<tr>
<td>Boat operation</td>
<td>3 positions + end position + cooling position</td>
</tr>
<tr>
<td>Sample boat</td>
<td>Ceramic</td>
</tr>
<tr>
<td>Boat cooling</td>
<td>Thermoelectric cooling</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>15～35℃ (No change during measurement)</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100/115/230/240V, 50/60 Hz, 150VA</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Approx. 440(W) × 360(D) × 430(H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 20 kg</td>
</tr>
<tr>
<td>Operation</td>
<td>Analyzer (Refer to &quot;Introduction&quot; in this manual for analyzer types.)</td>
</tr>
<tr>
<td></td>
<td>Automatic operation (Start the unit from the analyzer side with a personal computer.)</td>
</tr>
<tr>
<td></td>
<td>Manual operation (By the operation panel)</td>
</tr>
</tbody>
</table>
### Section 10: Consumables

#### 10-1. Consumables

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part Number</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Guide tube for ASC-120S</td>
<td>TX3RTG</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>S-ASC pushrod</td>
<td>BL1RDL</td>
<td>1 pc</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S-ASC sample boat (quartz glass)</td>
<td>TX3SCQ</td>
<td>5 pcs/bag</td>
<td>Transparent</td>
</tr>
<tr>
<td>4</td>
<td>S-ASC sample boat (ceramic)</td>
<td>TX3SCX</td>
<td>10 pcs/bag</td>
<td>White</td>
</tr>
<tr>
<td>5</td>
<td>S-ASC sample boat (ceramic)</td>
<td>TX3SCY</td>
<td>100 pcs/bag</td>
<td>White</td>
</tr>
<tr>
<td>6</td>
<td>S-ASC packing for the sample inlet port</td>
<td>TX3SCP</td>
<td>1 pc</td>
<td>With 4 spacers</td>
</tr>
<tr>
<td>7</td>
<td>Outer pyrolysis tube for TOX-100</td>
<td>TX3QPG</td>
<td>1 pc</td>
<td>For TOX-100 and TS-100</td>
</tr>
<tr>
<td>8</td>
<td>Inner pyrolysis tube for TOX-100</td>
<td>TX3QPN</td>
<td>1 pc</td>
<td>For TOX-100 and TN110 and ND-100</td>
</tr>
<tr>
<td>9</td>
<td>Outer pyrolysis tube (with nails) for TN-110</td>
<td>TN3QPG</td>
<td>1 pc</td>
<td>For TN110 and TOX-100+ND-100</td>
</tr>
<tr>
<td>10</td>
<td>Inner pyrolysis tube for TS-100</td>
<td>TS6QPI</td>
<td>1 pc</td>
<td>For TS-100</td>
</tr>
<tr>
<td>11</td>
<td>Outer pyrolysis tube for TSV</td>
<td>TS8QPG</td>
<td>1 pc</td>
<td>For AQF-100</td>
</tr>
<tr>
<td>12</td>
<td>Inner pyrolysis tube for AQF-100</td>
<td>AQ1QPN</td>
<td>1 pc</td>
<td>For AQF-100</td>
</tr>
<tr>
<td>13</td>
<td>Spring for a pyrolysis tube</td>
<td>SX1QSP</td>
<td>4 pcs/set</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Fuse 5A/2.5A</td>
<td>FU05MS/FU25MS</td>
<td>2 pcs/set</td>
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</tr>
</tbody>
</table>

**Table 10-1. ASC-120S consumables list**
## 10-2. Parts pictures

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Number</th>
<th>Pictures</th>
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<tbody>
<tr>
<td>1</td>
<td>TX3RTG</td>
<td><img src="image1.png" alt="Picture" /></td>
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<tr>
<td></td>
<td>Guide tube for ASC-120S</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>BL1RDL S-ASC pushrod</td>
<td><img src="image2.png" alt="Picture" /></td>
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<tr>
<td>3</td>
<td>TX3SCQ</td>
<td><img src="image3.png" alt="Picture" /></td>
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<tr>
<td></td>
<td>S-ASC sample boat (quartz glass)</td>
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<tr>
<td>4</td>
<td>TX3SCX</td>
<td><img src="image4.png" alt="Picture" /></td>
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<tr>
<td></td>
<td>S-ASC sample boat</td>
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</tr>
<tr>
<td></td>
<td>(Ceramic 10 pcs /bag)</td>
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</tr>
<tr>
<td></td>
<td>TX3SCY</td>
<td><img src="image5.png" alt="Picture" /></td>
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<tr>
<td></td>
<td>S-ASC sample boat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Ceramic 100 pcs /bag)</td>
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<tr>
<td>5</td>
<td>TX3QPQG</td>
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<td>Outer pyrolysis tube for TOX-100</td>
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</tr>
<tr>
<td>6</td>
<td>TX3QPNI</td>
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<td>Inner pyrolysis tube for TOX-100</td>
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<td>7</td>
<td>TN3QPQG</td>
<td><img src="image8.png" alt="Picture" /></td>
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<td>Outer pyrolysis tube (with nails) for TN-110</td>
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<td>8</td>
<td>TS6QPII</td>
<td><img src="image9.png" alt="Picture" /></td>
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<td>9</td>
<td>TS8QPG</td>
<td><img src="image10.png" alt="Picture" /></td>
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<tr>
<td>10</td>
<td>AQ1QPNI</td>
<td><img src="image11.png" alt="Picture" /></td>
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<td>Inner pyrolysis tube for AQF-100</td>
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<tr>
<td>11</td>
<td>SX1QSP</td>
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<td>TX3SCP</td>
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<td>S-ASC packing for the sample inlet port</td>
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</tr>
<tr>
<td></td>
<td>Fuse 5A/2.5A</td>
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</tr>
</tbody>
</table>

Table 10-2. ASC-120S parts pictures