High-precision Hydrogen Analyzer for Solid Materials

Hydrogen Analyzer

EMGA-921

Hydrogen
EMGA-921 is a hydrogen elemental analyzer with high accuracy and repeatability suited to advanced R&D as well as quality control in the markets of steel, new materials, catalysts and many others. This is a new generation model optimized to fit the user’s needs.

**Super High Performance**

- **Wide measurement range**
  - Hydrogen: Up to 200μg/g
  - Optimized TCD design for hydrogen.

- **Precision**
  - Hydrogen: SD≤0.04μg/g or RSD≤0.5% whichever is larger (Reference gas)

- **Standard method**
  - EMGA-921 fulfills requirements of the standard methods for analysis of various metals (titanium, zirconium, tantalum etc.)
  - JIS Z2614, JIS H1619, JIS H1664, JIS H0696
  - ASTM E1447

- **Analysis examples of JSS samples containing low concentrations of hydrogen.**

<table>
<thead>
<tr>
<th>JSS GS-1c</th>
<th>SS-5-27</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.77μg/g</td>
<td>7.39μg/g</td>
<td>–</td>
</tr>
<tr>
<td>2.227</td>
<td>6.971</td>
<td></td>
</tr>
<tr>
<td>1.711</td>
<td>7.364</td>
<td>6.979</td>
</tr>
<tr>
<td>1.686</td>
<td>7.367</td>
<td>6.973</td>
</tr>
<tr>
<td>1.703</td>
<td>7.418</td>
<td>6.981</td>
</tr>
<tr>
<td>1.729</td>
<td>7.436</td>
<td>6.967</td>
</tr>
<tr>
<td>1.719</td>
<td>7.405</td>
<td>6.974</td>
</tr>
<tr>
<td>Average</td>
<td>1.71</td>
<td>7.405</td>
</tr>
<tr>
<td>Standard</td>
<td>0.016</td>
<td>0.037</td>
</tr>
</tbody>
</table>

**Simple Operation**

- **Simple operation**
  EMGA-921 uses two automation systems for loading and disposing crucibles and for cleaning the electrodes after measurement. Automation sequences allow operation by simply positioning the sample and pushing the start button. The operator has to specify the method and the sample’s name in the software. The crucible loader and auto cleaner avoid operator contact with carbon dust by providing clean operating conditions.

- **Measurement window**
  Simple software allows easy operation. Extracted gas signals are displayed in real time numerically as well as graphically with curves that include temperature level. Graphs are saved automatically. In the measurement window, sample weight can be registered automatically. Results are saved in a data table for easy management.

**User-friendly Software**

- **HORIBA originality - Maintenance navigator**
  Maintenance counter informs users about consumables replacement to assure high accuracy results. In the same window, you can reach pictures and videos illustrating maintenance operations by a simple click. Operators can freely have a look at the concerned area by playing with the 3D display. As the navigator describes the easy-to-understand procedure for replacing parts, operators can perform routine maintenance without any experience or technical knowledge.
Fully Supported Accessories

To achieve high-speed and simple operation all accessories are included in the EMGA-921.

**Crucible loader** (automated crucible supply system)

Crucibles are accurately captured and supplied by motor rotation. Up to 100 crucibles can be stored at once. Compatible with both long and short crucibles.

**Automatic cleaner**

Upper and lower rotating brushes clean the electrodes after each analysis. Dirt is removed by a vacuum, to prevent contamination during measurement.

**Sample/Flux dual loading mechanism**

The original Sample/Flux dual loading mechanism developed by HORIBA features separate openings for loading of samples and flux, and incorporates a sequence in which the flux can be loaded in advance to be degassed at a low temperature level. This prevents excessive scattering of flux and crucible erosion, and allows flux degassing at optimum temperatures. As a result, this mechanism contributes to high-precision analysis with maximum use of the flux effect, without affecting the blank.

**Crucible waste box**

This box can hold about 200 crucibles for disposal after measurements.

**Hopper** (for sample loading)

The hopper mechanism has been redesigned for easier cleaning.

**Easy replacement of electrodes and reagent tubes**

**Gas flow**

- **Carrier gas Ar**
- **Extraction furnace**
- **Hydrogen component**
- **Dust filter**
- **Gas compensation mechanism**
- **Ambient temperature oxidant**
- **CO₂ absorbent**
- **Dehydrating agent**
- **Separation column**
- **H₂ detector**
- **Thermal Conductivity Detector (TCD)**

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Specifications

<table>
<thead>
<tr>
<th>Product name</th>
<th>Hydrogen Analyzer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>EMGA-921</td>
</tr>
<tr>
<td>Measurement method</td>
<td>Thermal Conductivity Detector (TCD)</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0.000001 mg/g</td>
</tr>
<tr>
<td>Sample weight</td>
<td>1 g as standard condition, possible to decrease.</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.001 mg/g</td>
</tr>
<tr>
<td>Precision (Repeatability)</td>
<td>± SD±0.04 mg/g or RSD±0.5% whichever is larger (Reference gas)</td>
</tr>
<tr>
<td>Display</td>
<td>1) Measurement result: PC or printout</td>
</tr>
<tr>
<td>Type of furnace</td>
<td>Impulse furnace with inert gas fusion with power variable from 0 to 8kw</td>
</tr>
<tr>
<td>Sample loading</td>
<td>Sample Flux dual loading mechanism</td>
</tr>
<tr>
<td>Automation functions</td>
<td>Auto cleaner, Crucible loader</td>
</tr>
<tr>
<td>Installation condition</td>
<td>Present integration times, integration time to reach the compare limit or both with the shortest time used.</td>
</tr>
<tr>
<td>Sample ID</td>
<td>Latter up to 30 characters</td>
</tr>
<tr>
<td>Calibration</td>
<td>1) One point or multi point calibration (Reference gas or standard samples)</td>
</tr>
<tr>
<td></td>
<td>2) Calibration using previous analysis data</td>
</tr>
</tbody>
</table>

Other available models
1. EMGA-821AC: same performance as EMGA-921 but without crucible loader
2. EMGA-821M: same performance as EMGA-921 but without crucible loader and auto cleaner

External dimensions

Areas marked in gray indicate space for opening/closing doors, etc.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>655mm(W) × 785mm(D) × 750mm(H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample window</td>
<td>Positioned at 650mm from table.</td>
</tr>
<tr>
<td>Cooling water circulation unit</td>
<td>H: 795mm, Weight: 55kg</td>
</tr>
</tbody>
</table>

Consumables/Options

<table>
<thead>
<tr>
<th>Standard crucible</th>
<th>Long crucible</th>
<th>Double crucible</th>
<th>Ni capsule</th>
<th>In capsule</th>
</tr>
</thead>
</table>

Installation example

- Flats marked in green must be provided by the user
- Air tank
  - 2-step pressure adjustment valve
  - With coupling for 6 SUS tube

- Power supply
  - AC 100 V ±10%
  - 1.5 kVA
  - 3-pin plug with earth

Please note that the indicated lengths of tubes, power cables, etc., are based on the length of accessories included. In the actual installation, ensure that the layout allows for some freedom of movement.

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http://www.horiba.com e-mail: info@horiba.co.jp

Please see the operation manual before using this product to assure safe and proper handling of the product.


We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

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