The solution for O/N/H analysis

The EMGA has all the functions essential for speeding up and automating analysis and maintenance work.


1. **Crucible loader**
   (Automated crucible supply system)
   
   - Precise capture and positioning of crucibles by rotary mechanism.
   - Maximum stack: 100 pcs.
   - Compatible with normal/long type crucibles.
   
   * Not available for the EMGA-800 series

2. **Hopper** (Sample window)
   
   - Smart hopper mechanism for large samples loading and easy cleaning.

3. **Auto-cleaner**
   
   - Two rotating brushes clean the upper and lower electrodes after each measurement.
   - The vacuum cleaner prevents contamination by removing dust.
   
   ** Optional for the EMGA-800 series

4. **Easy replacement of electrodes and reagent tubes**

5. **Crucible waste box**
   
   - About 200 crucibles can be stored before disposal.

6. **Sample/Flux dual loading mechanism**
   
   Thanks to this mechanism, sample and flux drop independently allowing out-gassing of the flux at low temperature prior to the analysis. The benefits are the prevention of the flux penetration, the control of the crucible and the optimization of flux out-gassing temperature. The optimization of flux efficiency and the reduction of blank signals result in highly accurate measurements.

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**Oxygen/Nitrogen/Hydrogen Analyzers**

**EMGA-900/800 series**

Wide range measurement from ppm to % without pretreatment. Automating functions for fast and accurate analysis.
Simple automated operation

EMGA uses two automation systems for loading and disposing crucibles, and for cleaning the electrodes after each measurement. With automated sequences, simply place the sample and push the start button.

The operator just needs to specify the method and the sample’s name in the software. The crucible loader and auto-cleaner avoid operator to be in contact with carbon dust and provide clean and secure operating conditions.

Options

- **Auto sampler**
  - Autoloader for both samples and fluxes
  - Numbered positions allow placing them without risk of error.
  - Also, we can provide a fully automated system. Please feel free to contact us.

- **Transfer vessel**
  - Measurement of samples isolated from air (ex: cathode electrode of Li batteries).
  - Sample can be prepared in a glove box and measured without atmospheric exposure.

User-friendly Software

- **Measurement window**
  - Intuitive software facilitates the instrument usage. Results are directly tabulated and extraction curves are displayed together with the temperature ramps.
  - Graphs are saved automatically. In the measurement window, sample weight can be registered automatically. Results are saved in a data table for easy management.

- **HORIBA Interactive maintenance - Maintenance navigator**
  - Maintenance counter informs users about consumables replacement frequency to assure that highly accurate results will be permanently obtained. In the same window, you can access pictures and videos illustrating maintenance operations by a simple click. Operators can easily 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.

Gas Flow

**EMGA-930/830, EMGA-920/820**

OMEGA-930/830, OMEGA-920/820: CO/CO₂/N₂

**EMGA-921/821**

- Carrier gas He
- Carrier gas Ar

High accuracy semiconductor-type non-dispersive infrared detectors (NDIR)

- CO detector
- CO₂ detector
- H₂O detector

- Copper oxide
- Dehydrating agent
- Separation column

Thermal conductivity detector (TCD)

- N₂ detector
- H₂ detector

* Also, we can provide a fully automated system. Please feel free to contact us.

* EMGA-930/920 only

Applications

- Measurement window
- HORIBA Interactive maintenance - Maintenance navigator

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# EMGA Series Specifications

## Common Specifications

<table>
<thead>
<tr>
<th>Measurement target element</th>
<th>EMGA-930/830</th>
<th>EMGA-920/820</th>
<th>EMGA-921/821</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen/Nitrogen/Hydrogen</td>
<td>Oxygen/Nitrogen</td>
<td>Hydrogen</td>
<td></td>
</tr>
<tr>
<td>Measurement gas type</td>
<td>CO / CO₂ / N₂ / H₂O</td>
<td>CO / CO₂ / N₂</td>
<td>H₂</td>
</tr>
<tr>
<td>Detector</td>
<td>Oxygen</td>
<td>NDIR: Detection with CO / CO₂</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nitrogen</td>
<td>TCD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrogen</td>
<td>NDIR: Detection with H₂O</td>
<td></td>
</tr>
<tr>
<td>Measurement range</td>
<td>Oxygen</td>
<td>~5%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nitrogen</td>
<td>~3%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Hydrogen</td>
<td>~0.25%</td>
<td>~0.02%</td>
</tr>
<tr>
<td>Precision repeatability</td>
<td>Oxygen</td>
<td>σ₁ ≤ 0.02 µg/g or RSD ≤ 0.5% whichever is larger (Reference gas)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nitrogen</td>
<td>α₀,₁ ≤ 0.3 µg/g (Standard sample value 10 µg/g or less)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrogen</td>
<td>σ₁ ≤ 0.04 µg/g or RSD ≤ 2.0% (Reference gas)</td>
<td></td>
</tr>
<tr>
<td>Sample weight</td>
<td>1.0 g (Standard condition, possible to decrease)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Required gases

- **He/Ar**: Purity greater than 99.995%, Pressure 0.35 MPa (Stainless steel tube (O.D. 3 mm) and suitable connector fitting within 3 m from unit)
- **Dry air or N₂ as operating gas**: Pressure 0.45 MPa (Nylon pipe (O.D. 6 mm) and suitable connector fitting within 5 m from unit)

## Display

- 1) Measurement result: PC or printout
- 2) Alarm message: PC or printout
- 3) Flow sheet: PC

## Dimensions

- **653 x 750 x 785 mm [W x H x D]** (Sample window is positioned at 650 mm from table)

## Power

- 1) Power supply voltage: 
  - Main unit AC 200/220/230/240 ±10 %
  - AC 100-240 V (step down transformers may be needed in some territories)
- 2) Voltage fluctuation: Within ±10 % of standard voltage
- 3) Frequency: 50/60 ±1 Hz
- 4) Electric power consumption: 
  - Main unit 12 kVA (MAX)
  - Vacuum cleaner 1.5 kVA (MAX)
- 5) Ground resistance: Less than 10 Ω

## Installation conditions

- 1) Temperature: 
  - Operation temperature: 5 - 40 °C
  - Optimum temperature: 5 - 35 °C
- 2) Humidity: 
  - Maximal relative humidity: 80% RH between 5 - 31 °C
  - Linearily decrease down to 50% RH between 31 - 40 °C
- 3) Vibration: 
  - Duplex amplitude 20 µm and 0.098 m/s² accelerations at frequency band

## Cooling mechanism

- Separate water cooler unit

## Electric balance

- Enable connection with electronic balance with 1 - 0.01 mg sensitivity

## Automatic voltage regulator (AVR)

- Capacity: 150 kVA
- Weight: 130 kg

## Computer

- PC with Windows®

*Windows is a registered trademark or trademark of Microsoft Corporation in the United States and other countries.*
**Setup Example**

- **Items marked in green must be provided by the user**
- **Power source:** AC 100 V ±10% 1.5 kW
  - 3-pin plug with earth

**Dimensions**

- **EMGA main unit**
  - Dimensions: 600mm x 660mm x 800mm

**Consumables**

- **Consumables and other options**
  - Standard crucible
  - Long crucible
  - Double crucible
  - Ni capsule
  - Sn capsule
  - Sn/Ni pellets
  - Manual press

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

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**HORIBA, Ltd.**

- **Japan**
  - Head Office
    - 2 Miyahigashi-cho, Kisshoin, Minami-ku, Kyoto, 601-8510, Japan
    - Phone: 81 (75) 313-8121 Fax: 81 (75) 321-5725

**HORIBA (China) Trading Co., Ltd.**

- **China**
  - Unit D, 1F, Building A, Synnex International Park, 1068 West Tianshan Road, 200335, Shanghai, China
  - Phone: 86 (21) 6289-5955 Fax: 86 (21) 6289-5953

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**IMSI**

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**Bulletin: HRE-3755B**