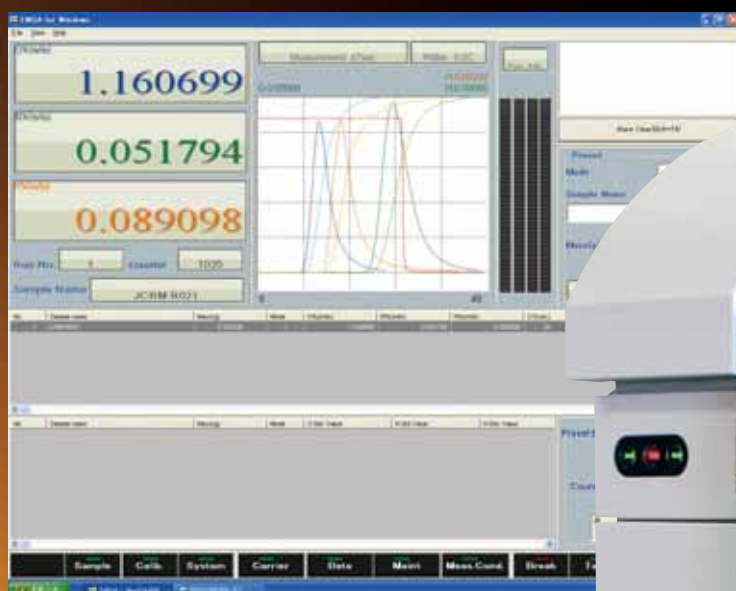


Oxygen/Nitrogen/Hydrogen Analyzer

EMGA-930

EMGA-930



Oxygen
Nitrogen
Hydrogen

Evolution

In Pursuit of High performance/Speed/Operability

EMGA-930 is a simultaneous oxygen/nitrogen/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

Oxygen: ~5%(m/m) & Nitrogen: ~3%(m/m)

Hydrogen: ~0.25%(m/m)

- Dual detectors for CO and CO₂ provide the widest measurement range for oxygen.
- Optimized TCD design for nitrogen.
- Mounting NDIR, H₂O detector that measures hydrogen enables to analyze 3 elements simultaneously.

● Precision

- Oxygen/Nitrogen: SD ≤ 0.02 μg/g or RSD ≤ 0.5% whichever is larger (Reference gas)
- Hydrogen: SD ≤ 0.04 μg/g or RSD ≤ 2.0% whichever is larger (Reference gas)

● Standard method

- EMGA-930 fulfills requirements of the standard methods for analysis of steel, titanium, tantalum, ceramics etc.
ISO 10720:1997, ISO 17053:2005
JIS G1228:1997
ASTM E1019:2003, ASTM E1569:2003, ASTM E1409:2005 etc.

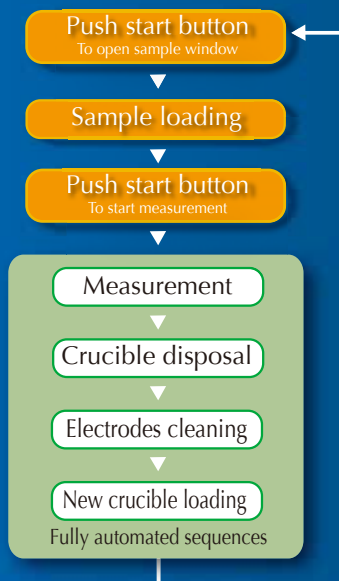
Analysis examples of JSS samples containing low concentration of Oxygen, Nitrogen and Hydrogen

| | JSS GS-6b | JSS366-8 | JSS GS-1d |
|--------------------|----------------|----------------|----------------|
| | O (3.4μg/g) | N (7.5μg/g) | H (1.6μg/g) |
| 1 | 3.42 | 7.72 | 1.59 |
| 2 | 3.28 | 7.74 | 1.60 |
| 3 | 3.48 | 7.51 | 1.61 |
| 4 | 3.25 | 7.69 | 1.55 |
| 5 | 3.51 | 7.25 | 1.62 |
| Average value | 3.39 | 7.58 | 1.60 |
| Standard deviation | 0.11 | 0.20 | 0.02 |

Simple Operation

● Simple operation

EMGA-930 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 does have to specify the method used and the sample's name in the software. The crucible loader auto cleaner avoid operator contact with carbon dust by providing clean operating conditions.



User-friendly Software

● 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.



● 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-930.

Crucible loader (Automated crucible supply system)



Precise capture and positioning of crucibles by rotary mechanism
Maximum stock: 100pcs. Compatible with normal or long type crucibles.

Hopper (Sample window)



Improved Hopper mechanism for easy cleaning.

Auto cleaner



Two rotating brushes clean the upper and lower electrode after each measurement. The vacuum cleaner prevents contamination by removing dust.

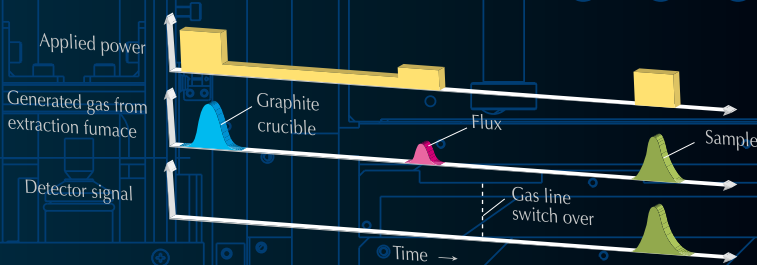
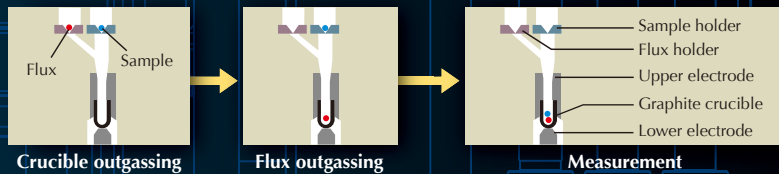
Crucible waste box



About 200 crucibles can be held in the waste box.

Dual Sample/Flux introduction mechanism

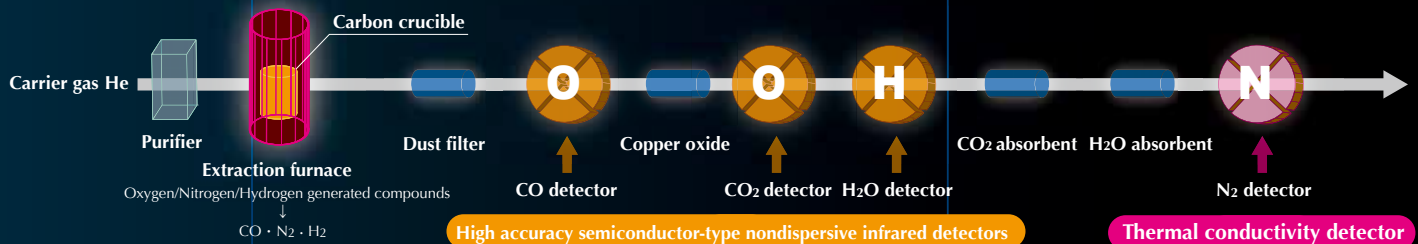
Thanks to this mechanism, sample and flux drop independently allowing outgassing of the flux at low temperature prior to the analysis. The benefits are prevention of flux spatter, control of crucible erosion and optimization of flux outgassing temperature. As a result, optimization of flux efficiency and blank reduction contribute to high accuracy measurements.



Easy replacement of electrode and reagent tubes



Gas flow diagram



- Oxygen determination : 2 NDIR detectors for high accuracy among the full measurement range. Automatically controlled by the software.
 - CO for high oxygen levels
 - CO₂ for low concentration of oxygen with high sensitivity
- Hydrogen determination : H₂O with NDIR (Non Dispersive Infra Red analyzer)
- Nitrogen determination : N₂ with Thermal Conductivity Detector (TCD)

Specifications

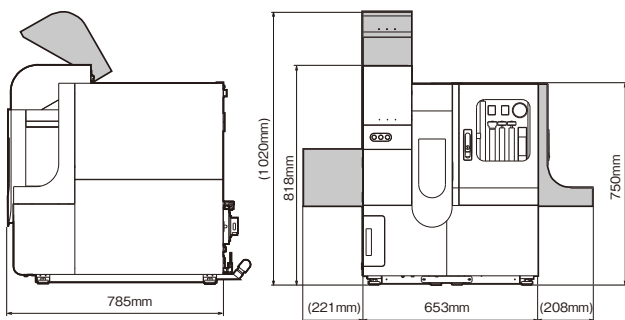
| | |
|-------------------------------|---|
| Product name | Oxygen/Nitrogen/Hydrogen analyzer |
| Model | EMGA-930 |
| Principle | Oxygen: Non Dispersive Infrared detector (NDIR) Nitrogen: Thermal Conductivity detector (TCD) Hydrogen: Non Dispersive Infrared detector (NDIR) |
| Measurement range* | Oxygen: ~5% (m/m) Nitrogen: ~3% (m/m) Hydrogen: ~0.25% (m/m) *Up to 100% wt is possible by decreasing the sample weight. |
| Sample weight | 1g as standard condition, possible to decrease |
| Sensitivity (Minimum reading) | Oxygen/Nitrogen/Hydrogen: 0.001µg/g |
| Precision (Repeatability) | Oxygen/Nitrogen: SD≤0.02µg/g or RSD≤0.5% whichever is larger (Reference gas) Hydrogen: SD≤0.04µg/g or RSD≤2.0% whichever is larger (Reference gas) |
| Display | 1) Measurement result: PC or printout 2) Alarm message: PC or printout 3) Flow sheet: PC |
| Type and power of furnace | Impulse furnace with inert gas fusion with power variable from 0 to 8.0kw |
| Sample introduction | Dual sample/flux introduction mechanism |
| Automation functions | Auto cleaner, Crucible loader |
| Integration conditions | Preset integration times, integration time to reach the comparator level or both with the shortest time used. |
| Sample ID | Enter up to 20 characters |

| | |
|---|---|
| Calibration | 1) One point or multi point calibration (Reference gas or standard samples) 2) Calibration using previous analysis data 3) Calibration curve correction function |
| Functions | 1) Display of realtime extraction curve 2) Analysis interruption 3) Self diagnosis and alarm display 4) Analysis of extraction curve 5) Output (RC-232C or TCP/IP) |
| Dimensions | 750mm(H)×785mm(D)×653mm(W) Sample window is positioned at 650mm from table. |
| Weight | 230kg: For transportation, the system can be split into 2 units < 140 kg each |
| Computer | PC with Windows XP (SP2) |
| Power | Main unit: AC200/220/230/240V ± 10% Vacuum cleaner: AC100V (Step-down transformer included) Frequency: 50/60Hz |
| Electric power consumption | Main unit: 12kVA (MAX) Vacuum cleaner: 1.5kVA (MAX) |
| Ground resistance | Less than 10Ω |
| Installation condition | Operation temperature: 5-40°C Optimum temperature: 5-35°C Humidity: Maximal relative humidity 80%RH between 5-31°C, Linearly decrease down to 50%RH between 31-40°C Vibration: Duplex amplitude 20micron and less than 0.098m/S ² accelerations at frequency band |
| Required gas | He carrier gas: Purity greater than 99.995%, Pressure 0.35MPa Stainless steel tube (O.D.3mm) and suitable connector fitting within 3m of unit Dry air or N ₂ as operating gas: Pressure 0.45MPa Nylon pipe (O.D.6mm) and suitable connector fitting within 5m of unit |
| Cooling mechanism | Separate Water Cooler unit |
| Electronic balance: option | Enable connection with electronic balance with 1-0.01mg sensitivity |
| Automatic voltage regulator (AVR): option | Capacity: 15kVA Weight: 130kg |

Other available models

- EMGA-830AC: same performance as EMGA-930 but without crucible loader
- EMGA-830M: same performance as EMGA-930 but without crucible loader and auto cleaner

Dimensional outline drawing (Space required to open and close the door)

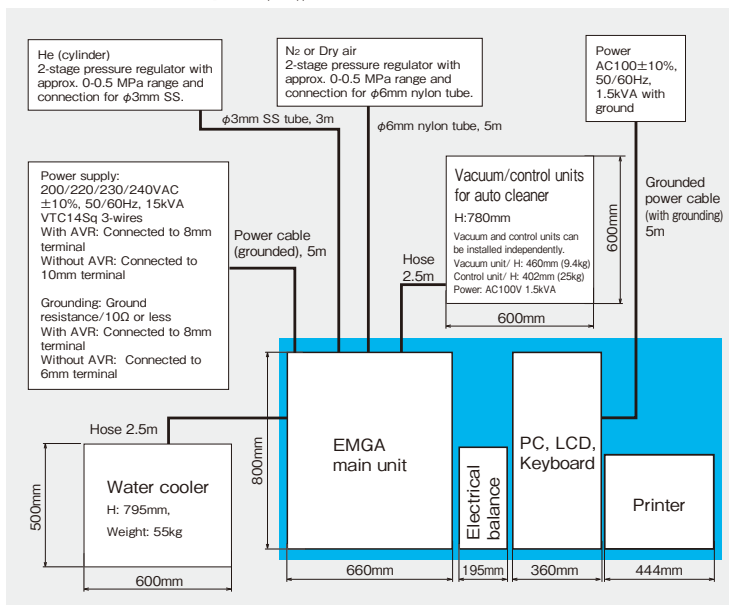


Consumables/Options



Installation example

Lab bench: Minimum width: Approx 1800mm (Recommended 2000mm)
Depth: Approx 900mm



Shown length of pipe and power cable are for accessories. Please install with enough space.

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