HORIBA JOBIN YVON

A World Ahead in Analyzer Technology

Oxygen/Nitrogen & Hydrogen Analyzers
EMGA Series

Excellence in gas analyzers since 1957

Over 186 years of Jobin Yvon optical experience

The expertise of HORIBA combustion technology

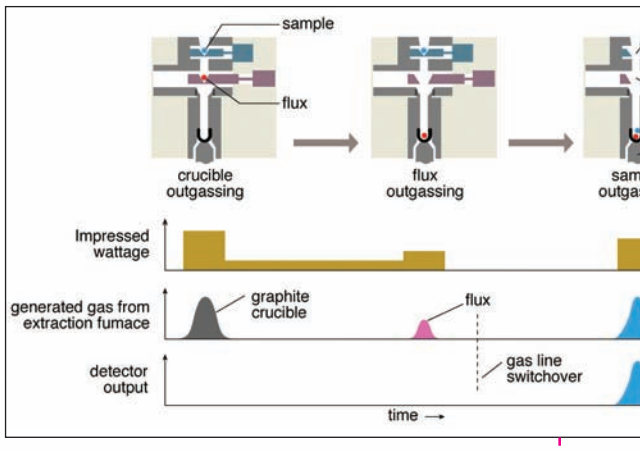
EMGA SERIES OXYGEN/NITROGEN & HYDROGEN ANALYZERS

A World Ahead in Analyzer Technology

An abundance of analytical functions and excellent, stable control technologies provide fast, high precision analysis of materials ranging from micro-quantity samples to high-concentration samples.The EMGA series is ready for a variety of applications, from research and development to on-site (field) analysis.

- New software functions have been added, including data access authorization, print layout, and functions for saving calibration settings and measurement conditions.
- Max. sample concentration of 3%(m/m) (for a 1.0 g sample weight) can be measured using the optional buffer tank.
- With a dual sample flux introduction mechanism, the ideal power settings for crucible and flux can be set independently.
- Both dust and electrode cleaning is possible with the optional automatic cleaning system.

Dual sample/flux introduction mechanism

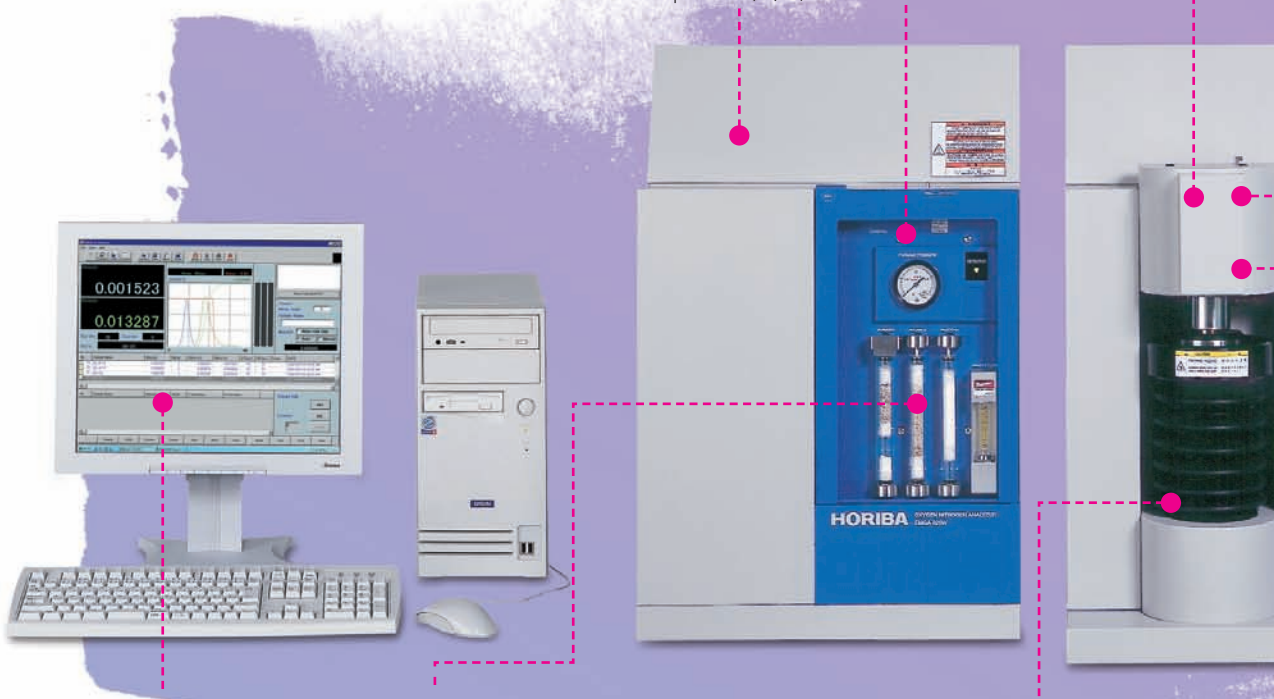


Wide Range (option)

With optional buffer tank, measurement range is widened up to 3%(m/m).

Purifier

Built-in purifier to clean carrier gas.



New software function

- Data access authorization
- Print layout
- Memory of calibration curve and measurement conditions.

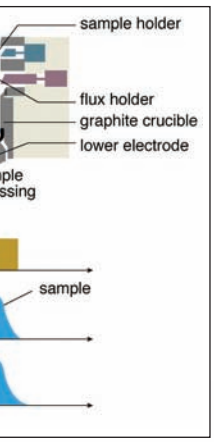
Reagent Tube

Gas supply is automatically stopped when replacing reagent.

Flexible electrode mechanism

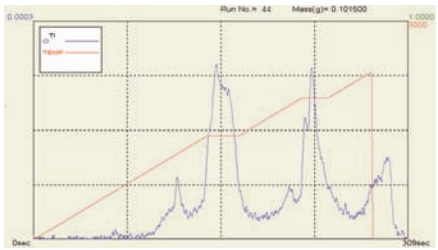
By using a flexible electrode, the EMGA-620W can be used for large or small crucibles of different shapes. By using the crucible that best matches the size of the sample operating costs can be reduced. It is also easy to set the analytical conditions to match each crucible.

Special window
Through a special window, the melting condition can be seen.



- **Multistep slope power control**
- **Real-time temperature hold function**
- **Temperature programmable pattern memory function**
- **Peak level setting function**

Temperature-programmed analysis–Oxygen
Sample : Ti
Furnace control : Automatic temperature hold function
0%(m/m)=0.060450 N%(m/m)=0.000000



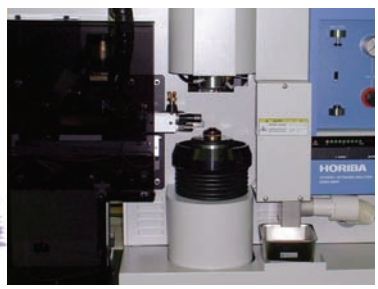
Option

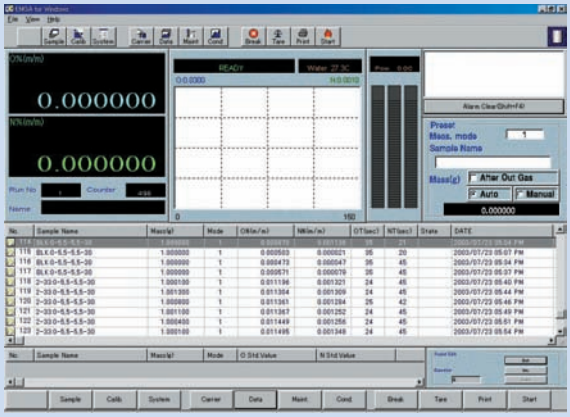
Automatic Sampler

Up to 48 samples can be set with this autosampler.

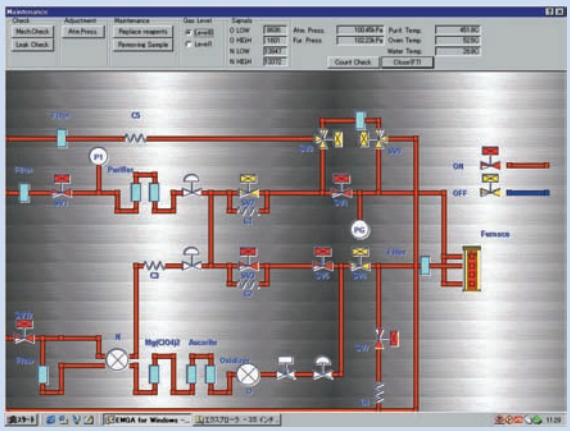
Automatic cleaner

Both upper and lower electrode are cleaned automatically after sample analysis. Dust after cleaning is also sucked by vacuum cleaner.

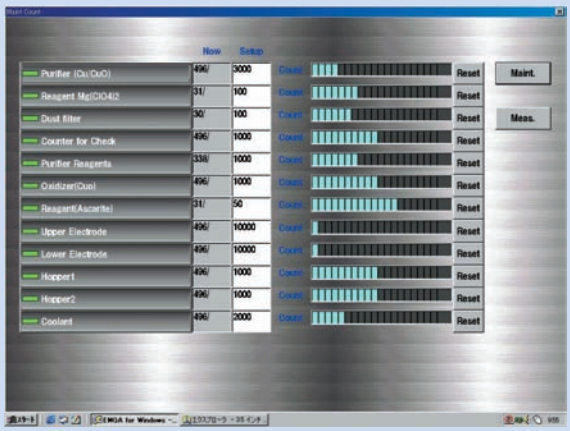




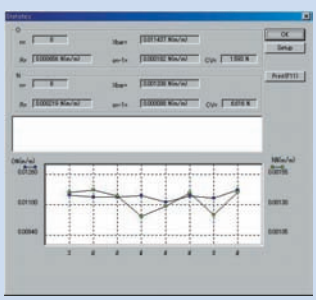
Easy operation under windows software • Measurement result. • Extraction graph. • Analysis mode. • Mass. • Preset. • Alarm. All these information is shown in one display.



Easy maintenance
• Leak check. • Mechanical check. • Detector signal check. After replacement of electrode and reagent, the status of gas leak is checked automatically. The state of mechanism driving, sensor and output can be confirmed easily by operator.



Counter screen
The recommended replacement time for some parts and reagent are shown on one display.

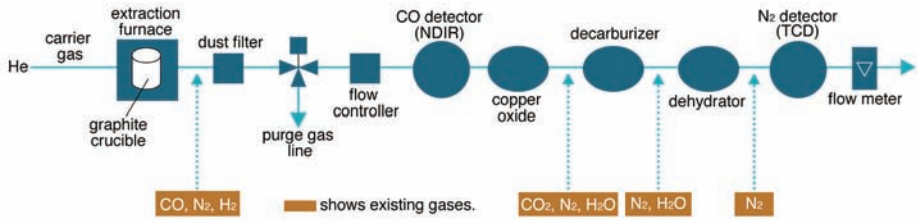


Multiple and easy data processing
- Overlay processing.
- Statistical processing function.
- Differential operation processing.
- Section operation processing etc.

Specifications

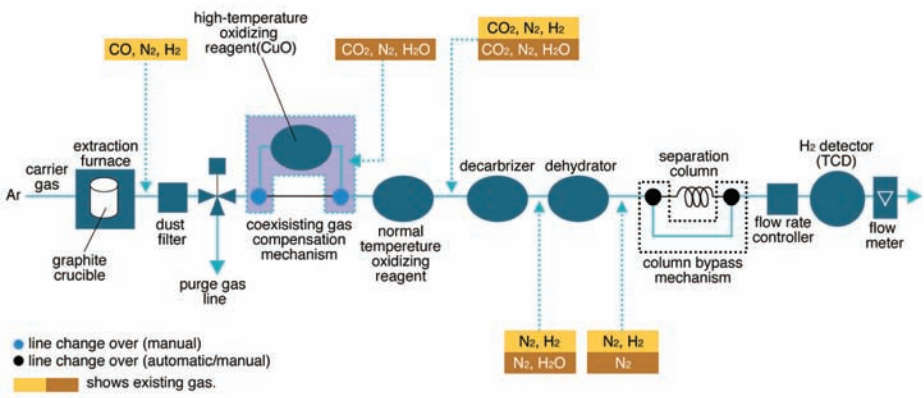
Model	EMGA-620W	EMGA-621W
Applications	**Oxygen/Nitrogen** Oxygen and/or Nitrogen in ferrous and non-ferrous metals, semiconductors and electronic materials.	**Hydrogen** Hydrogen in ferrous and non-ferrous metals, semiconductors and electronic materials.
Principle	**Oxygen/Nitrogen** Inert gas fusion in impulse furnace. O(Oxygen): NDIR(Non Dispersive Infrared absorption) N(Nitrogen): TCD(Thermal Conductivity Detection)	**Hydrogen** Inert gas fusion in impulse furnace. H(Hydrogen): TCD(Thermal Conductivity Detection)
Range	**O**: 0-0.1% / 0-1,000 ppm **N**: 0-0.5% / 0-5,000 ppm **Option** (with buffer tank) **O**: 0-3.0% **N**: 0-3.0% *The range may be expanded to 0-100%(m/m) by reducing the sample weight.	**H**: 0-0.02% / 0-200 ppm *The range may be expanded by reducing the sample weight.
Sample required	**Oxygen/Nitrogen** 1.0 g for regular analysis	**Hydrogen** 1.0 g for regular analysis
Accuracy (repeatability)	**Oxygen/Nitrogen** By solid standard sample •< 20 ppm $\sigma_{n-1} \leq 1$ ppm •≥ 20 ppm $\sigma_{n-1} \leq 1.5$ ppm or CV ≤ 1.5%, whichever is larger *By HORIBA recommended standard sample. **By reference gas (option)** $\sigma_{n-1} \leq 0.4$ ppm or CV ≤ 0.50%, whichever is larger *By HORIBA recommended reference gas.	**Hydrogen** By standard solid sample $\sigma_{n-1} \leq 0.08$ ppm or CV ≤ 1.0%, whichever is larger *By HORIBA recommended sample. **By reference gas** $\sigma_{n-1} \leq 0.04$ ppm or CV ≤ 1.0%, whichever is larger *By HORIBA recommended reference gas.
Sensitivity (minimum reading)	**Oxygen/Nitrogen** 0.000001% / 0.01 ppm	**Hydrogen** 0.001 ppm
Analysis time	**Oxygen/Nitrogen** Approx. 40 sec from gas extraction to measurement result display. *Depending on sample and extraction conditions.	**Hydrogen** Approx. 100 sec from gas extraction to measurement result display. *Depending on sample and extraction conditions.
Analysis conditions	16 combinations of the following conditions can be preprogrammed. **Extraction conditions:** Furnace control: Electrical power control - Wattage setting - Temperature setting *10 combinations of initial value, final value and time can be preprogrammed. Operation mode: 2 operation modes are available depending on the sample • Block mode • Powder mode	**Integration conditions:** • Preset time integration • Integration up to reach comparator level • Preset time integration or integration up to reach comparator level, whichever is shorter
Calibration	Multi-point approximation by 4 different formula. • One-point or multi-point (up to 30 points) calibration using standard sample • One-point or multi-point (up to 30 points) calibration using standard gas • Easy calibration using regular analysis data	
Display	**Monitor:** • Interactive display for setting the conditions of analysis and maintenance • Analysis data including results and conditions • Alarm messages • O/N extraction curve (H extraction curve for EMGA-621W) • Temperature curve • Integration curve • Preprogrammed analysis conditions	
Cooling method	Internal cooling water circulation method	
Functions	• Data storage: Pre-set list up to 100 items, Analysis results up to 1000 per file. • Furnace control: 10 furnace control patterns can be preprogrammed • Furnace temperature hold: The furnace temperature can be held at will when operating in interrupt analysis • Interrupt analysis • Sample fusion status monitoring • RS-232C output	• Self diagnosis: Reagent needs replacing, Dust-filter needs changing, Cooling water condition fault, Furnace condition fault, Operating gas condition fault, Carrier gas condition fault, Others. • Data access authorization • Print layout • Memory of calibration curve and measurement conditions.

EMGA-620W — Oxygen/Nitrogen Analyzer



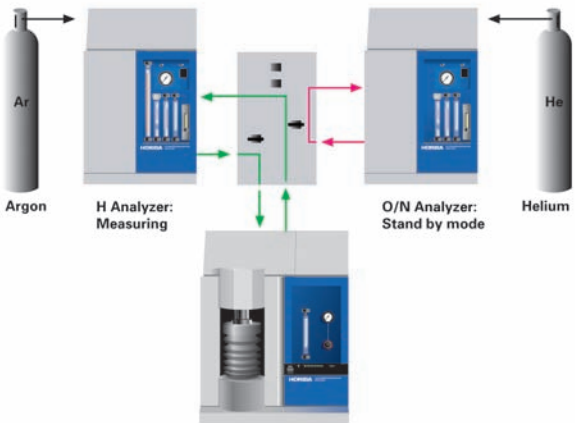
When a high current is passed through a graphite crucible placed between the upper and lower electrodes of the extraction furnace, the temperature of the crucible is increased rapidly by Joule heating. Raising the temperature outgasses the crucible, and the sample is then introduced and the temperature increased again for thermal decomposition. The O, N and H in the sample are carried to the detectors by the carrier gas in the forms of CO, N2 and H2 respectively. A non-dispersive infrared detector detects the CO and a thermal conductivity detector the N2. The detectors output a signal corresponding to the concentration of the gas detected. This signal is linearised and integrated by a microprocessor and then blank corrected in accordance with the calibration curve and corrected for sample weight. The resulting data is displayed as the measurement results.

EMGA-621W — Hydrogen Analyzer



The temperature-programmed analysis function of EMGA-621W For the standard measurement of Hydrogen, separation column is used so that Nitrogen and Hydrogen enter the TCD separately. Temperature-programmed analysis cannot be conducted with the standard gas flow mechanism as Nitrogen and Hydrogen gas enter the analyzer alternately, which makes it difficult to distinguish the overlapping peaks from Nitrogen and Hydrogen. Column bypass mechanism is used for the temperature-programmed analysis, where Nitrogen and Hydrogen gas enter the TCD together. Next, only the Nitrogen gas enters the TCD after Hydrogen is oxidized and removed by coexisting gas compensation mechanism. Finally, differential operation processing is made for two measurement results to determine Hydrogen contents.

EMGA-600W/ONH — Combined Oxygen/Nitrogen/Hydrogen Analyzer



During Hydrogen analysis, He carrier gas flows through the O/N detector unit. This allows quick shift from Hydrogen to O/N analysis.

The detectors for O/N/H are connected to the same single furnace through a gas selection unit. The schematic (left) show the operation principles of each.

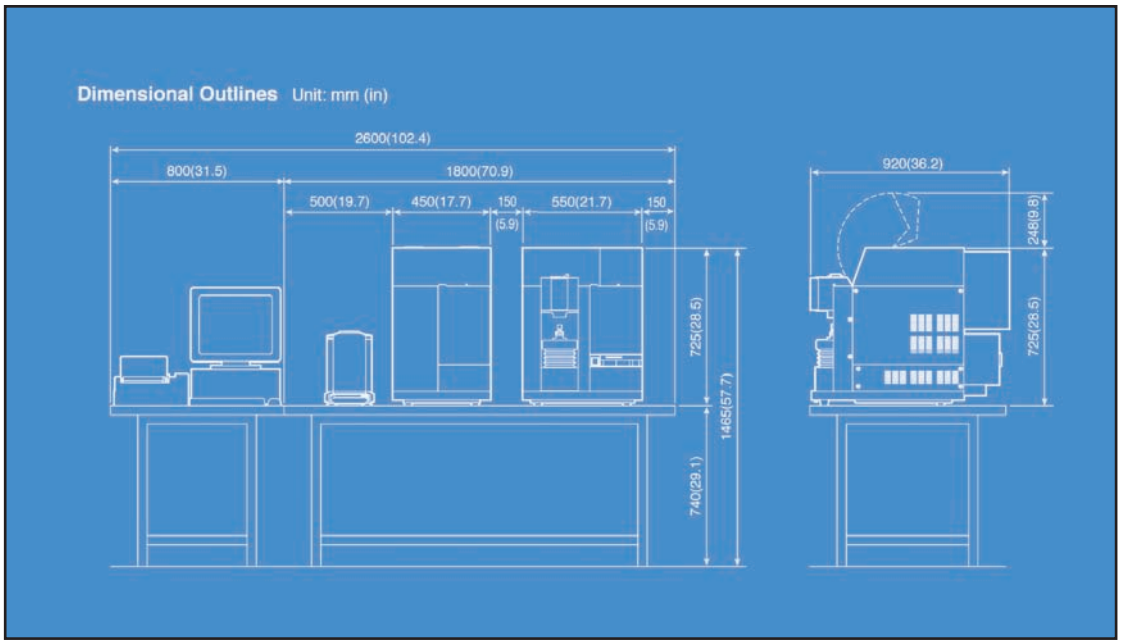
Facilities Required

Power: 220V AC
Voltage fluctuation: ±10%
Frequency: 50/60 Hz
Source noise: 500 Vp-p, pulse width less than 1 μ sec
Power consumption: max.12 kVA
Grounding:
Ground resistance: less than 10 Ohm
Gases required:
Carrier gas (He for EMGA-620W and Ar for EMGA-621W):
Purity: greater than 99.995%
Pressure: 0.4 MPa
Air or N2 as operating gas: Pressure: 0.5 MPa
Cooling water: 20 L pure water
Installation table: 2600(W) x 920(D) x 740(H) mm, capable of bearing at least 500 kg in mass.
Ambient condition:
Temperature: 5 - 35°C;
Humidity: 45 - 85% RH
Vibration: duplex amplitude 20 micron at a frequency band, less than 0.01 G

Connection (not provided):
Power: 8 mm terminal within 5 m of unit
Grounding: 6 mm terminal within 5 m of unit
Carrier gas: Stainless steel pipe (O.D. 3 mm) and suitable connecter fitting within 3 m of unit
Dry air or N2 gas: Nylon pipe (O.D. 6 mm) and suitable connecter fitting within 5 m of unit
Dimensions (W x D x H):
Analyzer unit: 450(W) x 920(D) x 725(H) mm
Combustion unit: 550(W) x 920(D) x 725(H) mm
Net mass:
Analyzer unit: approx. 100 kg
Combustion unit: approx. 170 kg (including the cooling water)

Options

- Electronic balance with interface
- Gas doser (standard accessory with the EMGA-621W)
- External cooling system
- Automatic Voltage regulator
- Air compressor



Specifications subject to change without notice.

ISO 9001:2000
Certificate No A 25

HORIBA JOBIN YVON

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