

EMGA Series

Oxygen/Nitrogen/Hydrogen Analyzers

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



The solution for O/N/H analysis

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

(Patents: US Patent No. 8172072, CN Patent No. ZL201510891513.0, JP Patent No. 5155751)

1 Crucible loader* (Automated crucible supply system)



Precise capture and positioning of crucibles by rotary mechanism.
Maximum stock: 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



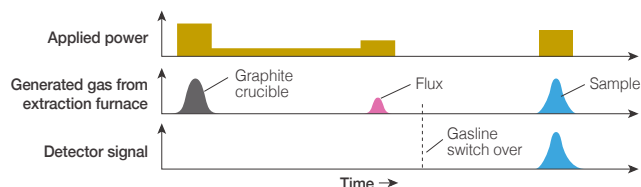
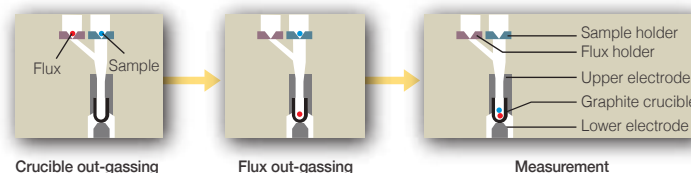
5 Crucible waste box

About 200 crucibles can be stored before disposal.



6 Sample/Flux dual loading mechanism

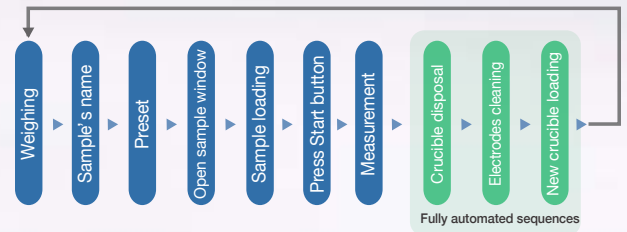
Thanks to this mechanism, sample and flux drop independently allowing out-gassing of the flux at low temperature prior to the analysis. The benefits are the prevention of the flux penetration, the control of the crucible and the optimization of flux out-gassing temperature. The optimization of flux efficiency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



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.



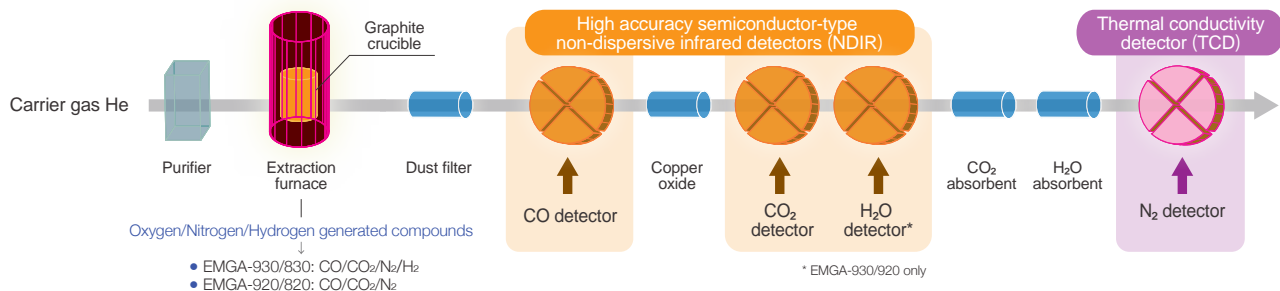
● HORIBA Interactive maintenance - Maintenance navigator

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.

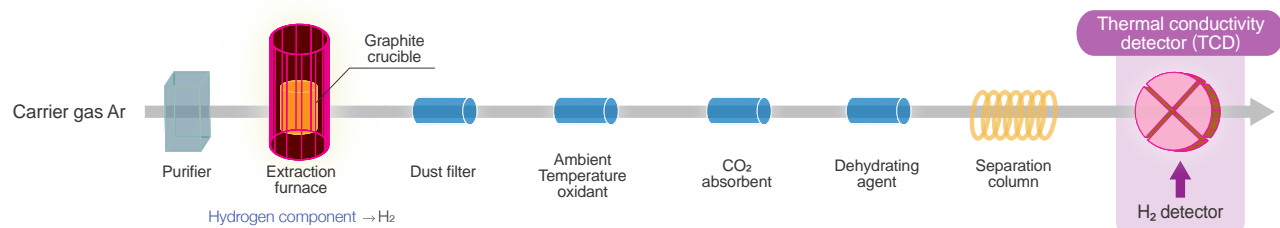


Gas Flow

EMGA-930/830, EMGA-920/820



EMGA-921/821



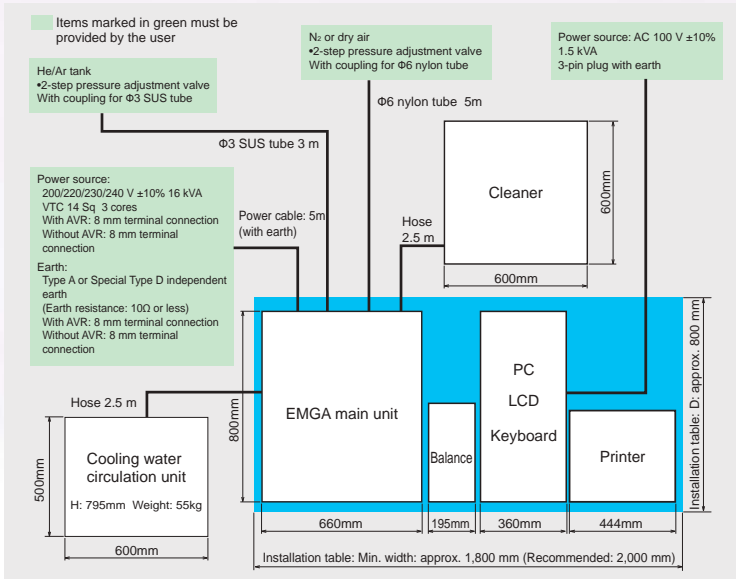
EMGA Series Specifications

		EMGA-930/830	EMGA-920/820	EMGA-921/821
Measurement target element		Oxygen/Nitrogen/Hydrogen	Oxygen/Nitrogen	Hydrogen
Measurement gas type		CO / CO ₂ / N ₂ / H ₂ O	CO / CO ₂ / N ₂	H ₂
Detector	Oxygen	NDIR: Detection with CO / CO ₂		-
	Nitrogen	TCD		-
	Hydrogen	NDIR: Detection with H ₂ O	-	TCD
Measurement range	Oxygen	~5%	~5%	-
	Nitrogen	~3%	~3%	-
	Hydrogen	~0.25%	-	~0.02%
Precision repeatability	Oxygen	$\sigma_{n-1} \leq 0.02 \mu\text{g/g}$ or $\text{RSD} \leq 0.5\%$ whichever is larger (Reference gas) $\sigma_{n-1} \leq 0.3 \mu\text{g/g}$ (Standard sample value 10 $\mu\text{g/g}$ or less) $\text{RSD} \leq 1.0\%$ (Standard sample value 0.01 to 0.02 %) $\text{RSD} \leq 0.5\%$ (Ceramic sample with standard sample value 15 % or more)		-
	Nitrogen			
	Hydrogen	$\sigma_{n-1} \leq 0.04 \mu\text{g/g}$ or $\text{RSD} \leq 2.0\%$ (Reference gas)	-	$\sigma_{n-1} \leq 0.04 \mu\text{g/g}$ or $\text{RSD} \leq 0.5\%$ (Reference gas)
Sample weight		1.0 g (Standard condition, possible to decrease)		

Common Specifications

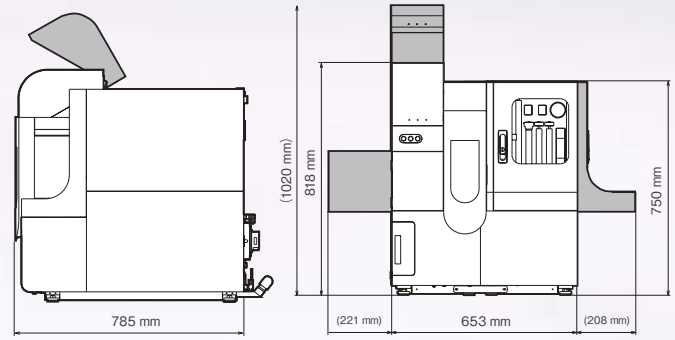
Sensitivity (Minimum Reading)	0.000001 % (m/m)	Dimensions	653 x 750 x 785 mm [W x H x D] (Sample window is positioned at 650 mm from table)
Display	1) Measurement result: PC or printout 2) Alarm message: PC or printout 3) Flow sheet: PC	Weight	230 kg (For transportation, the system can be split into 2 units <140 kg each)
Type of power of furnace	Impulse furnace with inert gas fusion with power variable from 0 to 8.0 kW	Power	1) Power supply voltage: - Main unit AC 200/220/230/240 $\pm 10\%$ - AC 100-240 V(step down transformers may be needed in some territories) 2) Voltage fluctuation: Within $\pm 10\%$ 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
Sample loading	Sample/Flux dual loading mechanism	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 - Linearly decrease down to 50% RH between 31 - 40 °C 3) Vibration - Duplex amplitude 20 μm and 0.098 m/s ² accelerations at frequency band
Automation functions	Crucible loader*, Auto-cleaner** (* Incompatible for EMGA-800 series, ** Optional for EMGA-800 series)	Cooling mechanism	Separate water cooler unit
Integration conditions	Both comparator integration and time integration are used; or either of them is selectable..	Electric balance (Option)	Enable connection with electronic balance with 1 - 0.01 mg sensitivity
Sample ID	Enter up to 20 characters	Automatic voltage regulator (AVR) (Option)	Capacity: 150 kVA Weight: 130 kg
Calibration	1) One point or multi-point calibration (References gasses or standard samples) 2) Calibration using previous analysis data 3) Calibration curve correction function	Computer	PC with Windows®10 <small>Windows is a registered trademark or trademark of Microsoft Corporation in the United States and other countries.</small>
Functions	1) Display of real-time extraction curve 2) Analysis interruption 3) Self diagnostics and alarm display 4) Analysis of extraction curve 5) Output (RS-232C or TCP/IP)	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 N ₂ as operating gas: Pressure 0.45 MPa (Nylon pipe (O.D. 6 mm) and suitable connector fitting within 5 m from unit)

Setup Example



*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.

Dimensions



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

Consumables

Consumables and other options



Standard crucible Long crucible Double crucible Ni capsule Sn capsule

Sn/Ni pellets Manual press



The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System OHSAS18001.

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



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

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