

Oxygen / Nitrogen / Hydrogen Analyzer ELEMENTRAC ONH-p

General Information

The ELEMENTRAC ONH-p determines oxygen, nitrogen and hydrogen in inorganic samples by inert gas fusion in an impulse furnace with temperatures in excess of 3.000 °C.

The ELEMENTRAC ONH-p guarantees precise and fast sample analysis. The analyzer covers a wide range of applications such as metal, ceramics and other inorganic materials.

The ELEMENTRAC ONH-p can be supplied with up to two infrared cells with different path lengths, accommodating both high and low level oxygen analyses. Nitrogen and hydrogen concentrations are determined in the ELEMENTRAC ONH-p by a robust and sensitive thermal conductivity cell.

Application Examples

alloys, cast iron, ceramics, copper, refractory metals, steel, ...

Product Advantages

- simultaneous oxygen/nitrogen or oxygen/hydrogen determination with inert gas fusion technique
- NEW: closed gas management and optimized gas circulation for sensitive ONH determination
- NEW: use of cost efficient argon as carrier gas possible
- NEW: powerful catalyst furnace for precise oxygen measurement
- NEW: gas flow system with electronic gas flow control and new leakage test
- NEW: water-cooled sample port system for effective removal of atmospheric gases
- flexible configurations and measuring ranges for O, N and H
- high sensitivity IR and TC cells with low detection limits
- short analysis time
- powerful 8,5 kW* impulse furnace for temperatures in excess of 3,000 °C
- economic analysis of grains without capsules
- NEW: chemicals and tubes are hidden behind a door (removable)
- NEW: powerful software (supporting data and application export, comment fields, and many more)
- single and multipoint calibration (linear regression)
- NEW: cooling via tap water or heat exchanger or chiller
- New design allows operation in production control and laboratory

Features

Measured elements	hydrogen, nitrogen, oxygen
Samples	inorganic
Furnace alignment	vertical
Sample carrier	graphite crucibles

NEW



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Field of application	ceramics, engineering / electronics, steel / metallurgy
Furnace	electrode impulse furnace (max. 8,5 KW*), temperatures in excess of 3,000 °C
Detection method	solid state infrared absorption for oxygen thermal conductivity for nitrogen and hydrogen
Typical analysis time	120 - 180 s
Chemicals required	copper oxide, magnesium perchlorate, Schuetze reagents, sodium hydroxide
Gas required	compressed air, helium 99.995 % pure, nitrogen 99.995% pure, argon 99.995% pure (if required), all gases with (2 - 4 bar / 30 - 60 psi)
Power requirements	3~ 400 V, 50/60 Hz, max. 8,500 W
Dimensions (W x H x D)	57 x 77 x 63 cm
Weight	~ 161 kg
Required equipment	balance (resolution 0.0001g), monitor, PC
Optional accessories	carrier gas purification, external chiller, gas calibration unit
-	* limited to 6.8 kw in application settings

Function Principle

Operation ONH-p

Operation of the ELEMENTRAC ONH-p is simple and safe. The samples are weighed on the interfaced balance and the weight is transferred to the linked PC. Manual weight entry is also possible.

Depending on the application the sample has to be placed in a nickel basket or capsule. Granulates or pins made of steel can be placed directly on the sample port without any other tools. Some applications require additional fluxes like tin or nickel, which have to be given in an empty graphite crucible. This graphite crucible is placed on the lower electrode tip and then the analysis is started. Typical analysis time is about 2.5 minutes.

All cell outputs and analyzer parameters are displayed in real time and are saved in a data base along with the results. Of course the results and application settings can be exported. The ELEMENTRAC ONH-p requires minimum maintenance and all particle filters and chemicals which need to be maintained are easily accessible. During daily work a door hides chemicals and filters. It can be removed easily to observe these during analysis.

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Measuring Principle ELEMENTRAC ONH-p

The measuring principle of the ELEMENTRAC ONH-p allows for a wide measuring range. To analyze the sample, it is weighed and placed on the sample port. Flushing with carrier gas prevents atmospheric gas (oxygen and nitrogen) from getting into the furnace.

The graphite crucible is outgassed in the impulse furnace to reduce possible contaminations (e.g. residual hydrogen). After a stabilization phase the sample is dropped into the crucible and melts. Carbon monoxide is produced by the reaction of carbon in the graphite crucible and oxygen of the sample. Nitrogen and hydrogen are released in its elemental form. The carrier gas (helium) and sample gasses pass through a filter before entering a copper oxide catalyst which converts the CO to CO₂.

The CO₂ is measured by the infrared cells to determine the oxygen content. CO₂ and water are removed chemically and the nitrogen content is measured in the thermal conductivity cell. In the case of hydrogen analysis the nitrogen carrier gas and the sample gas passes through a Schuetze reagent instead of a copper oxide catalyst. As an option the less expensive Argon can be used to determinate the oxygen and nitrogen content.

incl. order data

ELEMENTRAC® ONH-p

(Please order PC, monitor, balance and consumables (starter-kit, anhydron, sodium hydroxide, schuetze reagent, copper II oxide) separately)

Measuring ranges at 1,000 mg sample weight

88200-2011	ONH-p 1xO 0.1 - 200 ppm O
88200-2012	ONH-p 2xN 0.1 - 200 ppm N 10 ppm - 2 % N + 2xH 0.01 - 50 ppm H 20 - 1,000 ppm H
88200-2013	ONH-p 2xO 0.1 - 200 ppm O 10 ppm - 0.7 % O
88200-2014	ONH-p 1xO 0.1 - 200 ppm O + 2xN 0.1 - 200 ppm N 10 ppm - 2 % N + 2xH 0.01 - 50 ppm H 20 - 1,000 ppm H
88200-2015	ONH-p 2xO 0.1 - 200 ppm O 10 ppm - 0.7 % O + 2xN 0.1 - 200 ppm N 10 ppm - 2 % N + 2xH 0.01 - 50 ppm H 20 - 1,000 ppm H

ONH-p with new cell length configurations

88200-2040	ONH-p 1xO 40 ppm - 2 % O + 2xN 0.1 - 200 ppm N 10 ppm - 2 % N + 2xH 0.01 - 50 ppm H 20 - 1,000 ppm H
88200-2041	ONH-p 2xO 0.1 - 200 ppm O 40 ppm - 2 % O + 2xN 0.1 - 200 ppm N 10 ppm - 2 % N + 2xH 0.01 - 50 ppm H 20 - 1,000 ppm H

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Further measuring range combinations on request

PC, Monitor, Balance

71015	Computer with dual core processor, 300 GB HDD, 4 GB RAM, Windows operating system, DVD-ROM, keyboard, mouse
71016	Monitor, TFT
88600-0002	Balance (resolution 0.0001 g)
71002	Printer

Accessories

27000-2021	Gas calibration unit ELEMENTRAC series (integrated in analyzer)
21000	Carrier gas purification furnace, without filling (integrated in analyzer, please order filling and quartz wool separately)
72080	Nitrogen regulator
88400-0467	Chiller

Consumables

Required consumables

88500-0009	Starter-kit for 500 analyses (400 graphite crucibles, 50 outer graphite crucibles, 200 inner graphite crucibles, 50 g glass wool, 50 g quartz wool)
90200	Anhydron (magnesium perchlorate), 454 g
90210	Sodium hydroxide, 500 g
90270	Schuetze reagent, 100 g
90289	Copper II oxide, 100 g
90426-1001	Filling for carrier gas purification furnace

Optional consumables

90190	Graphite crucibles, 400 pieces
90180	Inner graphite crucibles, 100 pieces
90185	Outer graphite crucibles, 50 pieces
90331	Glass wool, 454 g
90330	Quartz wool, 50 g
91000-1001	Calibration standard - Copper, 100 pins, 1 g each ~500 ppm O
91100-1001	Calibration standard - Steel, 100 pins, 1 g each 25-40 ppm N
91205-1001	Calibration standard - Titanium, 100 pins, 0.1 g each 10-35 ppm H
91400-1001	Calibration standard - Steel, 100 pins, 1 g each 0.5 - 1

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	ppm H
92610	Tube of high vacuum grease
90870	Cooling agent, 0.5 l

Spare and Wear Parts

27590	Upper electrode
31360	Graphite tip
31365	Graphite tip holder
71010	Brush
71035	Cleaning brush / furnace brush
11064-3001	Reagent tube 120x20 mm
88400-0006	Reagent tube 280x20 mm
88400-0422	Reagent tube 240x20 mm
88400-0452	Quartz tube catalyst furnace, curved