

OXYGEN / NITROGEN / HYDROGEN ANALYZER
ELEMENTRAC ONH-p 2



The new ELEMENTRAC ONH-p 2 is a powerful and robust elemental analyzer for measurement of oxygen, nitrogen and hydrogen concentrations in inorganic materials like steel, iron, copper or ceramics. The highly sensitive NDIR and thermal conductivity detectors reliably detect element concentrations from low ppm content to high percentages.

The innovative sample port system with pulsed chamber rinsing and vertical sample drop allow for user-friendly and comfortable analysis of rod-shaped, granular or powdery samples with a weight of up to 2 grams.

The ELEMENTRAC ONH-p 2 elemental analyzer meets or exceeds the requirements of all relevant international standards such as ASTM E 1019 or DIN EN 3976.



[Click to view video](#)

Product Video

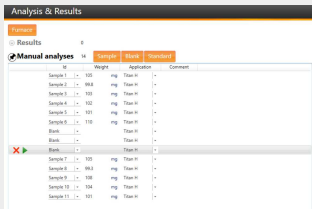
OXYGEN / NITROGEN / HYDROGEN ANALYZER ELEMENTRAC ONH-P 2

- | Low gas consumption and high sensitivity due to closed gas system
- | Easy application of pins, powders and granules
- | Inexpensive argon as carrier gas possible
- | Short analysis time
- | Powerful impulse furnace with 8.5 kW
- | Optional Autocleaner
- | Reliable ONH elemental analysis of inorganic samples like steel, non-ferrous metals, ceramics, slags, ores, etc.

ELTRA

OXYGEN / NITROGEN / HYDROGEN ANALYZER ELEMENTRAC ONH-P 2

OPERATION AND ANALYSIS PROCESS



Step 1: Logging the sample into the ELEMENTS software

The sample ID is logged into the software and the weight is automatically transferred (see step 2).



Step 2: Weighing and introduction of sample into the port

The ELEMENTRAC ONH-p 2 analyzes volumes from a few mg up to 2 grams safely and precisely. Rod-shaped or granular samples can be applied directly. For the elemental analysis of powders, a capsule is recommended which does not have to be sealed.



Step 3: Analysis

The empty graphite crucible is then placed on the lower electrode and the elemental analysis is started via the ELEMENTS software. The software controls all subsequent process steps.



Step 4: Data output and export

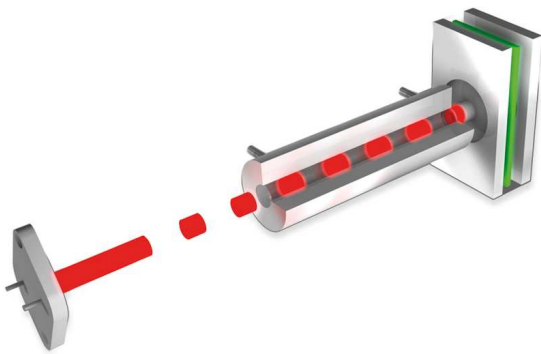
120 to 180 seconds after the analysis has started, the measured concentrations are available for export as a report or via LIMS.

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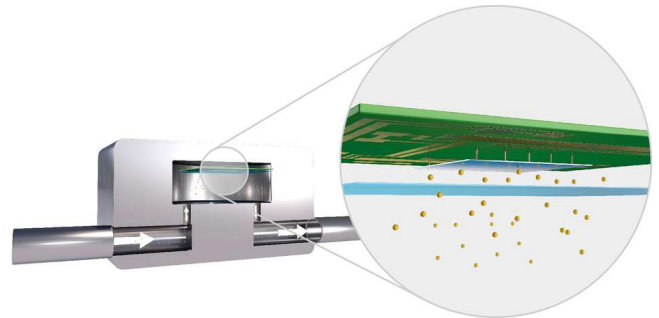
CONFIGURATIONS

The ELEMENTRAC ONH-p 2 elemental analyzer is available as a single-element analyzer for oxygen, nitrogen or hydrogen only, or in a multi-element configuration for measuring ON, OH, NH, or ONH. Whereas oxygen is determined as CO₂ in up to two infrared cells, nitrogen and hydrogen are detected in their elemental form in a thermal conductivity cell. The ELEMENTRAC ONH-p 2 elemental analyzer uses an ON mode with helium carrier gas (optionally argon) and an OH mode with nitrogen carrier gas to take advantage of the sensitive thermal conductivity cell.

CUVETTE WITH VARIABLE LENGTH



THERMAL CONDUCTIVITY CELL WITH HIGH SENSITIVITY



INTEGRATED STANDARD SOLUTIONS

The chemicals and filters required for the operation of the ELEMENTRAC ONH-p 2 elemental analyzer are arranged conveniently on the front panel and can be concealed behind a removable door during routine operation. This arrangement significantly reduces the time required for maintenance and increases user-friendliness. In addition, innovative details considerably improve the reproducibility of measurements.

Innovative sample port & pulsed chamber flushing

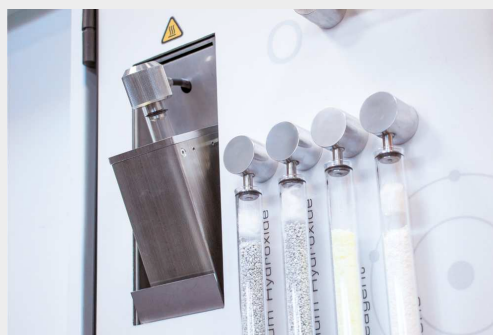
The new sample port of the ONH-p 2 elemental analyzer ensures comfortable operation and reproducible measured values. Differently shaped samples like solid pieces, granules or powder in capsules can be applied up to a weight of 2000 mg, and are quickly freed from the surrounding atmosphere with the help of pulsed carrier gas flushing in the sample port. Then they drop vertically into the preheated graphite crucible for analysis.



- Robust against dust development
- No closing of capsules required
- Direct application of up to 2000 mg granulate
- Low in maintenance and wear

Powerful catalyst

During elemental analysis, the graphite crucible, carbon monoxide (CO) is produced which is converted to carbon dioxide (CO₂) in the catalyst and subsequently detected in the IR cells. The easy-to-maintain catalyst with copper oxide filling ensures complete oxidation and thus, reliable oxygen analysis even of difficult materials such as oxides.



Closed gas management

The ELEMENTRAC ONH elemental analyzer series uses a closed gas system in overpressure. This ensures that always 100% of the released sample gas is fed to the detectors which guarantees low detection limits and good reproducibility.

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OPTIONS

In addition to the integrated solutions of the ELEMENTRAC ONH-p 2, further options are available to increase efficiency and extend the application range of your elemental analysis.

Autocleaner

By melting the sample in a graphite crucible at temperatures of up to 3000 °C deposits are generated at the upper electrode and in the furnace chamber which may affect the reproducibility of ONH measurements in a negative way.

The new optional Autocleaner reliably removes these deposits, enabling precise elemental analysis even for high throughputs. Additionally, an efficient gas calibration and cleaning furnace for thorough carrier gas pre-cleaning are available for the elemental analyzer.



ELEMENTS SOFTWARE

The comprehensive Windows-based ELEMENTS software is an essential part of all ELEMENTRAC generation elemental analyzers.

A central window (analysis and results) is the starting point from which all functionalities required for the daily routine are easily accessible. From here it is possible to group and export analyzed samples, or register and analyze new samples. The user may call up various subordinate functionalities like application settings, calibration, diagnosis, or status.



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TYPICAL SAMPLE MATERIALS

alloys, aluminum, ashes, carbides, cast iron, copper, ferroalloys, iron, metals, ores, refractory metals, silicon, steel, ...



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TECHNICAL DATA

Measured elements	hydrogen, nitrogen, oxygen
Samples	inorganic
Furnace alignment	vertical
Sample carrier	graphite crucibles
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	Schuetze reagents, copper oxide, magnesium perchlorate, 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)	56 x 78 x 64 cm
Weight	~ 165 kg
Required equipment	PC, balance (resolution 0.0001g), monitor
Optional accessories	carrier gas purification, external chiller, gas calibration unit
-	* limited to 6.8 kw in application settings

OXYGEN / NITROGEN / HYDROGEN ANALYZER ELEMENTRAC ONH-P 2

FUNCTION PRINCIPLE

The measuring principle of the ELEMENTRAC ONH-p 2 elemental analyzer 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 of the analyzer 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, nitrogen carrier as well as sample gas pass 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 during analysis.

www.eltra.com/onhp2

ORDER DATA

ELEMENTRAC ONH-P 2

(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 (further measuring range combinations on request)

2)

88200-2212	ONH-p 2	2xN + 2xH	0.1 – 200 ppm N 10 ppm – 2 % N 0.01 – 50 ppm H 20 – 1,000 ppm H
88200-2214	ONH-p 2	1xO + 2xN + 2xH	0.1 – 200 ppm O 0.1 – 200 ppm N 10 ppm – 2 % N 0.1 – 50 ppm H 20 – 1,000 ppm H
88200-2215	ONH-p 2	2xO + 2xN + 2xH	0.1 – 200 ppm O 10 ppm – 1 % O 0.1 – 200 ppm N 10 ppm – 2 % N 0.1 – 50 ppm H 20 – 1,000 ppm H
88200-2228	ONH-p 2	2xO + 2xN + 2xH	0.1 – 200 ppm O 50 ppm – 2 % O 0.1 – 200 ppm N 10 ppm – 2 % N 0.1 – 50 ppm H 20 – 1,000 ppm H

REQUIRED ACCESSORIES

PC, MONITOR, BALANCE

71015	Computer with Intel Core i5-8400 Processor, 256 GB SSD; 8 GB RAM; Windows 10 operating system; keyboard; mouse
88400-0584	Monitor, TFT (23.8")
88600-0002	Balance (resolution 0.0001 g)
88400-0592	Printer (HP LaserJet Pro M254nw)

REQUIRED CONSUMABLES / CHEMICALS FOR FIRST OPERATIONS

88500-0020	ONH-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 1)
90210	 Sodium hydroxide, 500 g 1)

90270		Schuetze reagent, 100 g 1)	for OH-p and ONH-p
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90289		Copper II oxide, 100 g 1)	for ON-p and ONH-p
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88600-0021		Copper oxide wire (for older ONH 2000 analyzer) 1)	
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FURTHER OPTIONS AND CONSUMABLES

ACCESSORIES (HARDWARE)

27000-2021		Gas calibration unit ELEMENTRAC series (for calibrating hydrogen)	
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88600-0016		Gas calibration unit ELEMENTRAC (for upgrading installed units; contains tubes and connection devices)	
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88200-9000		Carrier gas purification furnace, without filling (please order filling and quartz wool separately)	
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88400-0467		Chiller (SMC, 5900 W)	
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72080		Nitrogen regulator, 1 piece	
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72081		Pressure regulator, 1 piece	
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CRUCIBLES

90190		Graphite crucibles, 400 pieces (for copper, brass and steel analysis)	
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90180		Inner graphite crucibles, 100 pieces (requires outer graphite crucible 90185)	
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90185		Outer graphite crucibles, 50 pieces	
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88400-0491		HT crucibles, 1000 pieces, recommended for refractories (special application settings and 31360-3002 graphite tip required)	
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TIPS

31360		Graphite tip, 1 piece (for crucibles 90190 and 90185)	
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31360-3002		Graphite tip, 1 piece (for HT crucibles 88400-0491)	
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CAPSULES (REQUIRED FOR ANY KIND OF POWDER ANALYSIS)

90257		Nickel capsules, 3.2 x 7 mm, 100 pieces	
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90256		Nickel capsules, 4.5 x 10 mm, 250 pieces	
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88400-0066



Nickel capsules, pressed, 12.5 x 5 mm, 100 pieces

90252



Tin capsules, 5 x 18 mm, 100 pieces

BASKETS (REQUIRED FOR OXYGEN AND NITROGEN DETERMINATION IN REFRACTORIES)

90250



Nickel baskets, 100 pieces, 1 g each

88600-0012



Nickel baskets, high purity (low oxygen), 100 pieces, 1 g each

FLUXES (REQUIRED FOR SOME APPLICATIONS)

90251



Tin pellets, 454 g (for determination of hydrogen in titanium)

90800



Graphite, 50 g (improves oxygen determination)

90258



Nickel accelerator, 100 g (for analysis of high amount of refractories)

CHEMICALS (FILLINGS FOR GLASS AND QUARTZ TUBES)

90200



Anhydron (magnesium perchlorate), 454 g

90210



Sodium hydroxide, 500 g

90270



Schuetze reagent, 100 g

for OH-p and ONH-p

90289



Copper II oxide, 100 g

for ON-p and ONH-p

90426-1001



Filling for carrier gas purification furnace (suitable for one filling, ONH series)

90330



Quartz wool, 50 g

90331



Glass wool, 454 g

90332



Glass wool, 50 g

92610



Tube of high vacuum grease, 35 g

ELEMENTRAC - ADDITIONAL TOOLS

All ELEMENTRAC analyzers are equipped with a set of necessary tools

The following list provide part numbers for replacement of worn tools and some new tools to improve handling.

SPATULAS AND TWEEZERS

88400-0476



Micro spatula, 1 piece, XS size

23110



Spatula, 1 piece, M size

23111



Spatula, 1 piece, L size

88400-0475



Set with 6 spatula and 1 tweezers, for multiple weighing procedures

88400-0229



Tweezers (160 mm), curved, 1 piece, for transporting pins and baskets

88400-0472



Tweezers (145 mm), straight, 1 piece, for removing samples out of the ONH-p furnace

88400-0213



Tongs for crucibles, 1 piece, for putting crucibles on the electrode tip

TOOLS FOR STORAGE, TRANSPORTING AND WEIGHING

88400-0477



Weighing boat, 1 piece, for weighing and usage of granulates

36121



Quartz boat, 74x22x10 mm, 1 piece, for weighing pins

88400-0509



Metal pan, 1 piece, for storage of used crucibles, boats

TOOLS FOR CLEANING AND MAINTENANCE

71010



Brush, 16 mm, 1 piece, for cleaning balance from dust

88400-0500



Telescope mirror, 1 piece, for inspection of upper electrode of ONH-p/ONH-2000

88400-0473		Powder funnel (plastics), 1 piece, for easy filling of chemical tubes
88400-0489		Rubber plug 14x20x24 mm, 1 piece, for sealing small glass tubes like 88400-0006
71032		Composite brush, 1 piece, for cleaning upper electrode of ONH-p furnace
71035		Cleaning brush / furnace brush, 1 piece, for cleaning sample inlet of ONH furnaces
71031		Metal brush, 1 piece, for cleaning graphite tip and its holder
88400-0504		Cylinder brush, brass, for intensive cleaning of lower furnace
88400-0501		Micro brush, 1 piece, for cleaning of ONH series furnace outlet tube
61030		Allen key, 3 mm, 1 piece
61040		Allen key, 4 mm, 1 piece
61050		Allen key, 5 mm, 1 piece

CALIBRATION MATERIALS

Calibration materials may show slight variations depending on the current lot.

To see the current certification please visit www.ELTRA.com.

OXYGEN AND NITROGEN IN STEEL, PINS

91100-1001		Steel, 100 pins, 1 g each, 25 – 40 ppm N
91100-1002		Steel, 100 pins, 1 g each, 30 – 70 ppm N
91100-1003		Steel, 100 pins, 1 g each, 150 – 250 ppm N
91100-1004		Steel, 100 pins, 1 g each, 50 – 80 ppm N
91100-1005		Steel, 100 pins, 1 g each, 300 – 600 ppm N
91100-1007		Steel, 100 pins, 1 g each, 70 – 130 ppm N
91100-1010		Steel, 100 pins, 1 g each, >1000 ppm N

91100-1011 Steel, 100 pins, 1 g each, 600-1000 ppm N

HYDROGEN IN STEEL, PINS

91400-1001  Steel, 100 pins, 1 g each, 0.5 – 1 ppm H

91400-1002  Steel, 100 pins, 1 g each, 1.5 – 4 ppm H

91400-1003 Steel, 100 pins, 1 g each, >5 ppm H

STEEL, BALLS (H)

91110  Steel, 100 balls, gold plated, 1 g each, >1.9 ppm H

OXYGEN IN COPPER, PINS

91000-1001  Copper, 100 pins, 1 g each, >~500 ppm O

91000-1002  Copper, 100 pins, 1 g each, >~300 ppm O

91000-1004  Copper, 100 pins, 1 g each, ~10 ppm O

OXYGEN, NITROGEN AND HYDROGEN IN TITANIUM, PINS

91205-1001  Titanium, 100 pins, 0.1 g each, 10 – 35 ppm H

91205-1002  Titanium, 100 pins, 0.1 g each, 20 – 70 ppm H

91205-1003  Titanium, 100 pins, 0.1 g each, 30 – 90 ppm H

91205-1004  Titanium, 100 pins, 0.1 g each, 60 – 120 ppm H

91205-1005  Titanium, 100 pins, 0.1 g each, 150 – 250 ppm H

91205-1006 Titanium, 100 pins, 0.1 g each, 120 – 150 ppm H

HYDROGEN AND CARBON IN TITANIUM, PINS (250 MG)

91305-1001 Titanium, 100 pins, 0.25 g each, < 50 ppm H

91305-1002 Titanium, 100 pins, 0.25 g each, 50 -100 ppm H

91305-1003 Titanium, 100 pins, 0.25 g each, > 100 ppm H

Please note: Every analyzer requires PC, monitor, balance and some consumables (crucibles, chemicals) which have to be ordered separately

1), Hazardous material

2), Measuring ranges may vary depending on sample weight and sample material