ELTRA®
a VERDER company

OXYGEN / NITROGEN ANALYZER

ELEMENTRAC ON-p

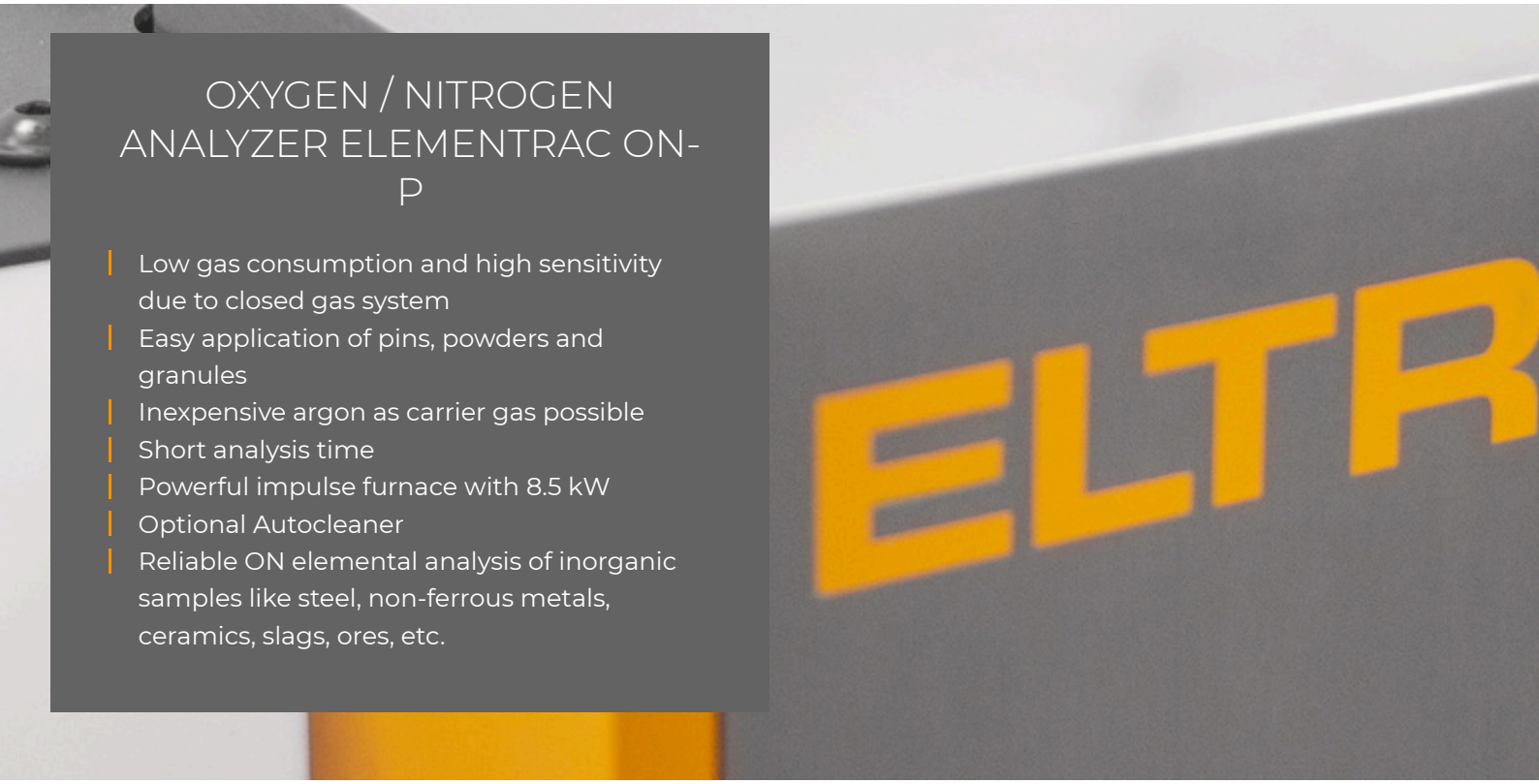
The new ELEMENTRAC ON-p is a powerful and robust elemental analyzer for measurement of oxygen and nitrogen concentrations in inorganic materials like steel, iron, copper or ceramics. The highly sensitive NDIR and thermal conductivity detectors reliably detect element concentrations from low ppm content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

The ELEMENTRAC ON-p 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

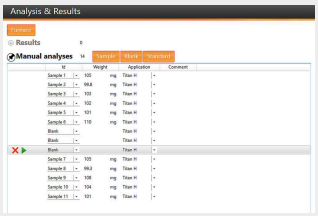
Product Video



OXYGEN / NITROGEN ANALYZER ELEMENTRAC ON-P

- 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 ON elemental analysis of inorganic samples like steel, non-ferrous metals, ceramics, slags, ores, etc.

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 ON -p 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.

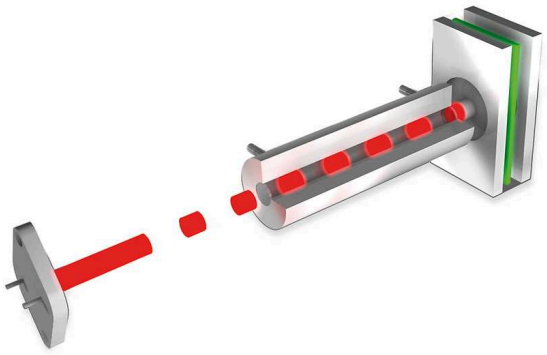
Step 4: Data output and export

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

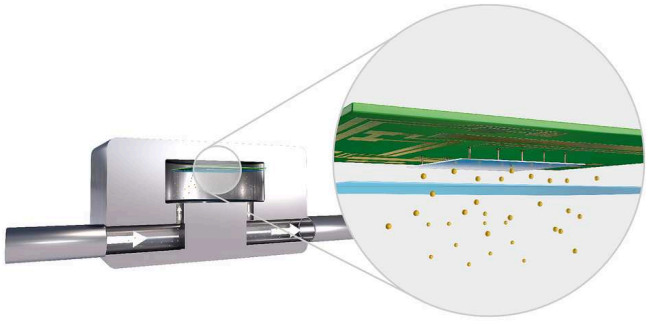
CONFIGURATIONS

The ELEMENTRAC ON -p elemental analyzer is available as a single-element analyzer for oxygen or nitrogen only, or in a multi-element configuration for measuring ON. Whereas oxygen is determined as CO_2 in up to two infrared cells, nitrogen is detected in its elemental form in a thermal conductivity cell.

CUVETTE WITH VARIABLE LENGTH



THERMAL CONDUCTIVITY CELL WITH HIGH SENSITIVITY



INTEGRATED STANDARD SOLUTIONS

The chemicals and filters required for operation of the 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 ON -p elemental analyzer ensures comfortable operation and reproducible measured values. Differently shaped materials 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 in the graphite crucible, carbon monoxide (CO) is produced which is converted to carbon dioxide (CO_2) 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.

OPTIONS

In addition to the integrated solutions of the ELEMENTRAC ON-p , 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 ones. The user may call up various subordinate functionalities like application settings, calibration, diagnosis, or status.

IOT - INTERNET OF THINGS

THE PLATFORM FOR REMOTE ACCESS TO YOUR DEVICES

All ELTRA analyzers seamlessly integrate with the Verder Scientific IoT platform, providing enhanced functionality, seamless connectivity, and additional benefits:

- **Real-time Monitoring**: Gain insight into the status of your machines at any time thanks to immediate access to important data.
- **Live Notifications**: Stay up to date on the status of your devices with instant notifications.
- **Effortless Backup**: Whether you need to back up a single device or an entire fleet, back up your data effortlessly and minimize downtime.
- **Automatic Software Updates**: Verder Scientific IoT keeps your device software up to date, optimizing performance and reliability.
- **Access to Analyses Data**: ELTRA analyzers offer remote access to analysis data. This allows you to conveniently access important data while on the move.
- **Autoloader Efficiency**: Get the most out of remote analysis preparation with our autoloader feature, which ensures uninterrupted operation and increased productivity for all instruments equipped with it.

Experience the power of the Verder Scientific IoT platform today and unlock the full potential of your ELTRA analyzers!

TYPICAL SAMPLE MATERIALS

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

FUNCTIONAL PRINCIPLE

The measuring principle of the ELEMENTRAC ON -p 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 material. 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 CO_2.

The CO_2 is then measured by infrared cells to determine the oxygen content. CO_2 and water are removed chemically and the nitrogen content is measured in the thermal conductivity cell. As an option the less expensive Argon can be used in the elemental analyzer to determinate the oxygen and nitrogen content.

OXYGEN / NITROGEN ANALYZER ELEMENTRAC ON-P

TECHNICAL DATA

Measured elements	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
Typical analysis time	120 - 180 s
Chemicals required	copper oxide, magnesium perchlorate, sodium hydroxide
Gas required	compressed air, helium 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	PC, monitor, balance (resolution 0.0001g)
Optional accessories	carrier gas purification, external chiller, gas calibration unit
-	* limited to 6.8 kw in application settings

www.eltra.com/onp2

ORDER DATA

ELEMENTRAC ON-P 2

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

				Measuring ranges at 1,000 mg sample weight (further measuring range combinations on request)	2)
88200-2201		ON-p 2	1xO	0.04 ppm – 0.04 % O	
88200-2202		ON-p 2	2xN	0.04 ppm – 3 % N	
88200-2203		ON-p 2	2xO	0.04 ppm – 1 % O	
88200-2205		ON-p 2	2xO + 2xN	0.04 ppm – 1 % O 0.04 ppm – 3 % N	

REQUIRED ACCESSORIES

PC, MONITOR, BALANCE		
71015-1000	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")	
88400-0645	Balance (resolution 0.0001 g)	

REQUIRED CONSUMABLES / CHEMICALS FOR FIRST OPERATIONS

88500-0018		ON-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		Anhydrone (magnesium perchlorate), 454 g 1)	
90210		Sodium hydroxide, 500 g 1)	
90270		Schuetze reagent, 100 g 1)	for OH-p and ONH-p
90289		Copper II oxide, 100 g 1)	for ON-p and ONH-p

88600-0021	Copper oxide wire (for older ONH 2000 analyzer) 1)

FURTHER OPTIONS AND CONSUMABLES

ACCESSORIES (HARDWARE)

88200-2400	ONH-p Autoloader (incl. autocleaner and vacuum cleaner)
88200-2401	ONH-p Autocleaner (incl. vacuum cleaner)
88400-0467	Chiller (SMC, 5900 W)
88200-9000	Carrier gas purification furnace, without filling (please order filling and quartz wool separately)
72081	Pressure regulator, 1 piece

CRUCIBLES

88400-0471		Graphite crucibles, 400 pieces (recommended for autoloader operation)
90190		Graphite crucibles, 400 pieces (for copper, brass and steel analysis)
90180		Inner graphite crucibles, 100 pieces (requires outer graphite crucible 90185)
90185		Outer graphite crucibles, 50 pieces

TIPS

31360		Graphite tip, 1 piece (for crucibles 90190 and 90185)

CAPSULES (REQUIRED FOR ANY KIND OF POWDER ANALYSIS)

90257		Nickel capsules, 3.2 x 7 mm, 100 pieces
90256		Nickel capsules, 4.5 x 10 mm, 250 pieces
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)			
88600-0028		Eltrasorb, 500g (black coloured sodium hydroxide)	
90200		Anhydrone (magnesium perchlorate), 454 g 1)	
90210		Sodium hydroxide, 500 g	
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 neccessary 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

TOOLS FOR CLEANING AND MAINTENANCE

27000-8007		O-ring set ONH-p (furnace)
27000-8008		Maintenance kit ONH-p
27000-8009		O-ring set ONH-p
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
88600-0027		Sodium hydroxide, Anhydrone filter tube
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
91100-1005		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

STEEL, BALLS (H)

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

OXYGEN IN COPPER, PINS

91000-1003		Copper, 100 pins, 1 g each, ~200 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