Oxygen / Nitrogen Analyzer ELEME TRAC ON-p

General Information

The ELEMENTRAC ON-p determines oxygen and nitrogen in inorganic samples by inert gas fusion in an impulse furnace with temperatures in excess of 3,000 °C.

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

Application Examples

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

Product Advantages

- simultaneous nitrogen and oxygen determination with inert gas fusion technique
- NEW: closed gas management and optimized gas circulation for sensitive ON 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 and N
- 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
- NEW: chemicals and tubes are hidden behind a door (removable)
- NEW: powerful software supporting data and application export, with comment fields
- single and multipoint calibration (linear regression)
- NEW: cooling via tap water, heat exchanger or chiller
- New design allows operation in production control and laboratory

Features

<table>
<thead>
<tr>
<th>Measured elements</th>
<th>nitrogen, oxygen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples</td>
<td>inorganic</td>
</tr>
<tr>
<td>Furnace alignment</td>
<td>vertical</td>
</tr>
<tr>
<td>Sample carrier</td>
<td>graphite crucibles</td>
</tr>
<tr>
<td>Field of application</td>
<td>ceramics, engineering / electronics, steel / metallurgy</td>
</tr>
</tbody>
</table>
Oxygen / Nitrogen Analyzer ELEMENTRAC ON-p

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: 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 ELEMENTRAC ON-p

Operation of the ELEMENTRAC ON-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 also require some additional fluxes like tin or nickel, which have to be filled into an empty graphite crucible. This graphite crucible is placed on the lower electrode tip and the analysis can be 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 ON-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.

Measuring Principle ELEMENTRAC ON-p
Oxygen / Nitrogen Analyzer ELEMENTRAC ON-p

The measuring principle of the ELEMENTRAC ON-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 oxygen). 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 is 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. As an option the less expensive Argon as carrier gas can be used instead of the more expensive helium.

incl. order data

ELEMENTRAC® ON-p

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

Measuring ranges at 1,000 mg sample weight

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>88200-2001</td>
<td>ON-p 1xO 0.1 - 200 ppm O</td>
</tr>
<tr>
<td>88200-2002</td>
<td>ON-p 2xN 0.1 - 200 ppm N</td>
</tr>
<tr>
<td>88200-2003</td>
<td>ON-p 2xO 0.1 - 200 ppm O</td>
</tr>
<tr>
<td>88200-2004</td>
<td>ON-p 1xO 0.1 - 200 ppm O + 2xN 0.1 - 200 ppm N</td>
</tr>
<tr>
<td>88200-2005</td>
<td>ON-p 2xO 0.1 - 200 ppm O</td>
</tr>
</tbody>
</table>

ON-p with new cell length configurations

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>88200-2030</td>
<td>ON-p 1xO 40 ppm - 2 % O + 2xN 0.1 - 200 ppm N</td>
</tr>
<tr>
<td>88200-2031</td>
<td>ON-p 1xO 40 ppm - 2 % O</td>
</tr>
<tr>
<td>88200-2032</td>
<td>ON-p 2xO 0.1 - 200 ppm O</td>
</tr>
<tr>
<td>88200-2033</td>
<td>ON-p 2xO 0.1 - 200 ppm O</td>
</tr>
</tbody>
</table>

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

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Subject to technical modifications and errors

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Product Information

**Oxygen / Nitrogen Analyzer ELEMENTRAC ON-p**
- 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)
- 72081 Pressure regulator
- 88400-0467 Chiller

**Consumables**

**Required consumables**
- 88500-0007 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 Anhydrome (magnesium perchlorate), 454 g
- 90210 Sodium hydroxide, 500 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
- 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
Oxygen / Nitrogen Analyzer ELEMENTRAC ON-p

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