SKALAR
a Velaris brand

THE PRIMACS™ SNC-100
CARBON & NITROGEN ANALYZER

Advancing Automation Together

THE PRIMACS™ SNC-100

CARBON & NITROGEN ANALYZER

Enhance efficiency, accuracy, and reproducibility in laboratory workflows

The PRIMACS™ SNC-100 TOC / TN analyzer

A flexible solid sample analyzer with integrated 100-position autosampler for determination of Nitrogen (N) / Protein, Total Carbon (TC), Total Elemental Carbon (TEC), Total Inorganic Carbon (TIC) & Total Organic Carbon (TOC).

The analyzer provides fast, accurate and low-level analysis for these parameters in applications such as soil & plant, sludges & sediments, animal feed & grain, food, malt, fertilizer etc.

The PRIMACS™ SNC-100 contains a large integrated 100 position autosampler and is covered with a transparent lid. The sampler can analyze large daily sample loads in one batch. The sample rack is removable and re-usable ceramic crucibles are used for sample weights up to 3 g of solid material. The samples are introduced in the analyzer through a unique vertical sample introduction system. Sample ashes remain in the crucible after the analysis and are taken out of the instrument with removal of the crucible. This avoids sample ash build-up in the combustion zone and therefore reduces maintenance.

High temperature combustion with Non-Dispersive Infrared detection (NDIR) is used for the analysis of TOC, TEC and TIC. The temperature settings are variable and a special temperature ramping program allows the analysis of TEC also called Residual Oxidizable Carbon (ROC) according to DIN 19539. TIC can also be analyzed separately using automatic acidification and purging.

The determination of TN / Protein is based upon DUMAS methodology and detection with Thermal Conductivity Detection (TCD). The Dumas technique for TN analysis is a fast and environmental friendly alternative for the Kjeldahl classical technology.

The analyzer uses various control systems to guarantee correct operation and accurate results such as:

- An internal active temperature stabilization system, which eliminates influences of room temperature
- An automated control system, for checking gas flow & pressure in the system

The system is delivered with a very practical and flexible software package, with pre-installed method files, user definable sample table set up and integrated QC features.

Applications

Skalar has developed applications for a variety of industries.
Our comprehensive applications library provides a large selection of standardized references.

Soil & Plant
Soil testing is carried out to determine the level of nutrients in soil available for plants. Nitrogen is the most important element for plant development and carbon is essential for soil structure, energy for biological processes and provision of nutrients. With Skalar's PRIMACS™ SNC-100 analyzer the determination of TN, TC, IC and TOC can be performed rapidly and easily.

Food & Animal feed
Animal feed and other food products are analyzed for several reasons, such as monitoring product quality and compliancy with official regulations. Also, the analysis of protein, through the measurement of Nitrogen, is used as a marker for the nutritional quality of food products. The PRIMACS™ SNC-100 is the perfect solution for accurate and rapid testing in laboratories, processing a wide variety of nutritional samples.

Waste management
In waste management, it is sometimes necessary to differentiate between the different carbon fractions such as TOC, TEC and TIC in a sample. High TOC levels in the soil prevent the anaerobic digestion process and limit the Nitrogen enrichment in the subsoil. Via the traditional high temperature combustion or the acidification method, the TOC value determined is the sum of TOC + TEC, instead of TOC only. The PRIMACS™ SNC-100 offers a special temperature ramping program allowing for the analysis of TOC, TEC and TIC separately, according to DIN 19539 which perfectly suits this application.

Sludges & Sediments
In waste samples such as sludge, Nitrogen and Carbon analysis is important for pollution control. Ammonium, Nitrate, Nitrite and other Nitrogen compounds can serve as a nutrient source for troublesome water organisms. The PRIMACS™ SNC-100 offers a fast and consistent determination of Nitrogen and Carbon levels simultaneously.

Other applications include:
Grain & Seed, Malt and Fertilizer.

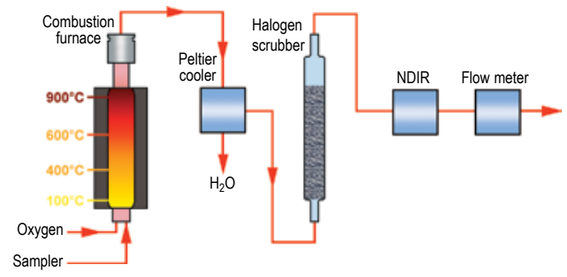
The PRIMACS™ SNC-100 TOC / TN analyzer

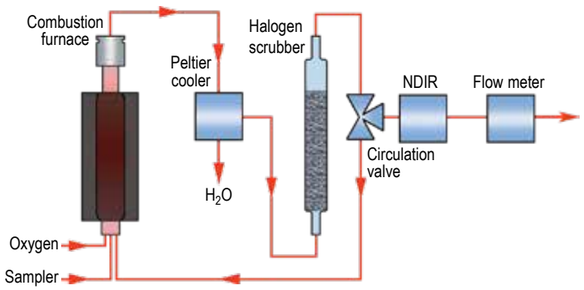
For the determination of various types of Carbon and Nitrogen/ Protein different analysis and detection methods are used in the analyzer.

The individual processes are described below, but can be combined in one unit:

1. TC – by high temperature combustion
In the combustion furnace carbon is completely oxidized to CO2, by continuously circulating the sample through the combustion furnace. The CO2 is measured by Non-Dispersive Infrared detection (NDIR) for Total Carbon.

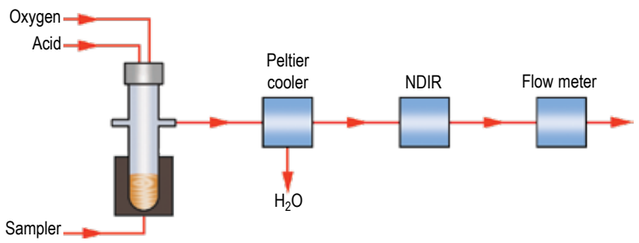
2. OC, EC, IC – by Temperature dependent differentiation according to DIN 19539
In case different carbon fractions need to be determined, samples are positioned at different heights in the combustion furnace. Each height has a different temperature. The first peak measured at 450 °C is the OC value, the second peak at 600 °C is the EC value and the last value at 900 °C is for IC. The advantage of this patented Skalar technique is that it is very fast, because there is no need to heat or cool down the furnace.





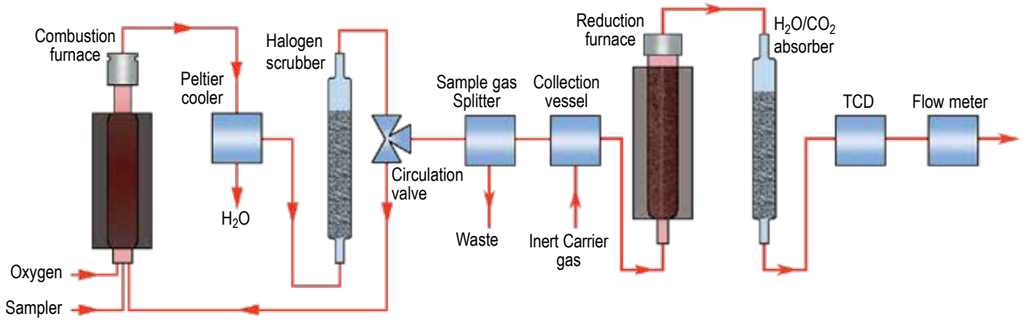
3. IC – by acidification

The samples are introduced in the IC reactor at 150°C. Phosphoric acid is automatically added to the sample. Carbonates are converted into CO2. The CO2 is purged by a carrier gas and measured by Non-Dispersive Infrared detection (NDIR).



4. TN – by high temperature combustion according to Dumas methodology

In the combustion furnace, Nitrogen is converted into NxOy in presence of Oxygen. In the reduction furnace all Nitrogen is reduced to N2. The N2 gas is measured by Thermal Conductivity Detection (TCD).



Typical PRIMACS™ SNC-100 configurations

The inside of the PRIMACS™ SNC-100 analyzer is flexible in construction. Depending on the requirement of the laboratory, a suitable configuration can be selected. Skalar offers in total 10 different models.

TC / IC / TOC / TN analyzer
perfect for soil applications

TN analyzer
suitable for food applications

TC / IC / EC / TN analyzer
for waste management

Data Acquisition & Instrument Control

The PRIMACS™ SNC-100 analyzer is controlled by Skalar's flexible SN-Access data acquisition software.

The software is easy to set up and very user-friendly Using pull-down menus for different actions, it allows the operator to start analysis within a few minutes.

Via pre-defined methods, the analysis settings such as oven temperature, sample time, valve settings etc. can be easily selected. An analysis table is created or imported from a text or Excel file. During analysis the table can be modified to enable the addition of priority samples also samples or sample positions can be edited or deleted.

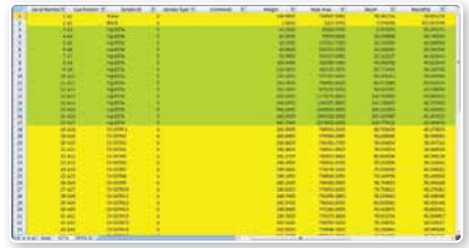
A dual display is available during the run to monitor both the Carbon and the Nitrogen channels in real-time simultaneously. Peak information is available and editable during analysis. An analyzer control screen displays real-time information such as temperatures and detector signals, which are of major importance for reliable elemental analysis.

All analytical results and calibration curves can be viewed and edited in the results window. The analysis results and calibration curves can easily be printed or exported to a LIMS system in a custom-made report.

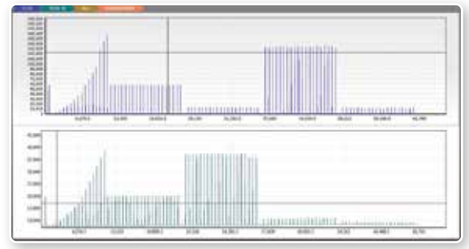
Software features

- Table wizard, for quick set up of the sample workload
- User defined alarm levels for safe and unattended operation
- User defined access levels to prevent unauthorized actions
- Separate raw data file storage
- Real-time graphs of analysis integration data for calibration
- Dual or single screen views of Carbon and Nitrogen
- Availability of peak editing mode, during or after analysis, for optimizing analysis data before reporting
- Export of analyzed data to other locations and to LIMS systems
- Storage of calibration curves and automatic "best curve" selection

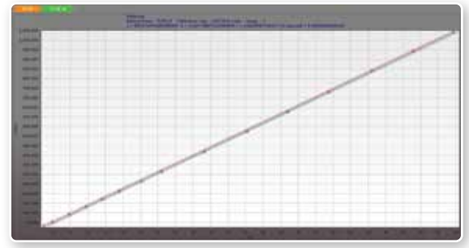
Analyzer control screen



Analysis results



Graphic analysis results



Calibration screen

Other Skalar TOC & TN Analyzers

Skalar offers a variety of TOC and TN analyzers that are available for liquid or solid samples, all based on international standard regulations.

Solid samples

PRIMACS™ MCS TOC analyzer

The PRIMACS™ MCS analyzer provides TOC analysis on solid materials. The analyzer is designed as an add-on module and operates in combination with the FORMACS™ HT/LT TOC analyzer. It allows for the analysis of TC, IC and TOC.

Liquid samples

FORMACS™ HT TOC analyzer

The FORMACS™ HT TOC analyzer provides a fast and reliable analysis of Total Organic Carbon (TOC) in liquid samples using high temperature catalytic combustion. The unit is designed to measure TC, IC, TOC, NPOC, POC and DOC in water samples. The instrument is customized for the sample type and optimized from a range of different catalysts.

FORMACS™ HT-i TOC analyzer

The FORMACS™ HT-i TOC/TN analyzers provide fast, reliable analysis of TOC and TN in liquid samples by direct sample injection in a high temperature catalytic combustion furnace. The units are especially designed for particulate laden samples (suspensions), but can handle the concentration of nitrogen and/or carbon fractions from various other sample matrices.

FORMACS™ HT TN analyzer

A TN detector is available as an addition to the FORMACS™ HT analyzer for TN analysis using a chemiluminescence detector in combination with high temperature oxidation. Optionally the FORMACS™TN can be extended for NO3 + NO2 analysis using Skalar's unique NN reactor.

To check which analyzer is the best solution to automate your application(s) visit our website www.skalar.com or contact us directly via E-mail or phone. (see next page)

Get in touch!

Visit our website
Additional information can be found on our website

www.skalar.com

Ask a Question
Contact us via E-mail and we will get back to you as soon as possible

info@skalar.com

Call us
If you require direct assistance, don't hesitate to call us!

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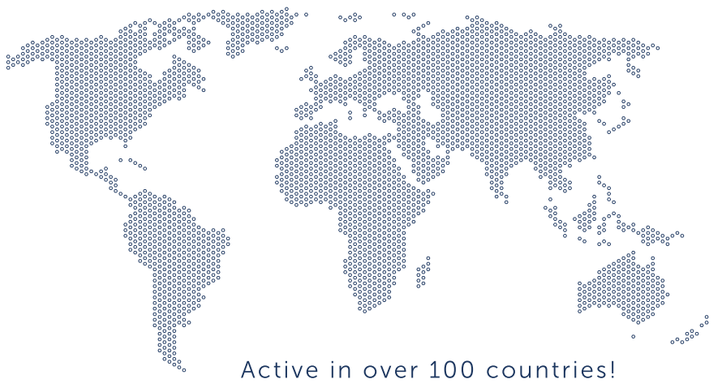
Worldwide automation solutions



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Velaris reserves the right to change the specifications and the appearance of the equipment without further notification.

Version 1.0