

# Automated analysis for individual samples and sample series

When more samples have to be analysed without taking on additional personnel or expanding the laboratory, automation is the answer. This applies to drinking water laboratories, industrial quality control, large sewage treatment plants as well as electroplating facilities food, pharmaceutical and petrochemical sectors. HACH LANGE can provide you with reliable solutions for different methods and parameters.



TOC/TN analyser with an especially wide measuring range  
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TITRALAB titration systems now with RFID—for simple and reliable GLP  
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GANIMEDE  
Analysers with patented flash digestion for total N and total P  
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QUICKCHEM 8500 FIA analyser with ready-to-use reagents, for up to 120 samples per hour  
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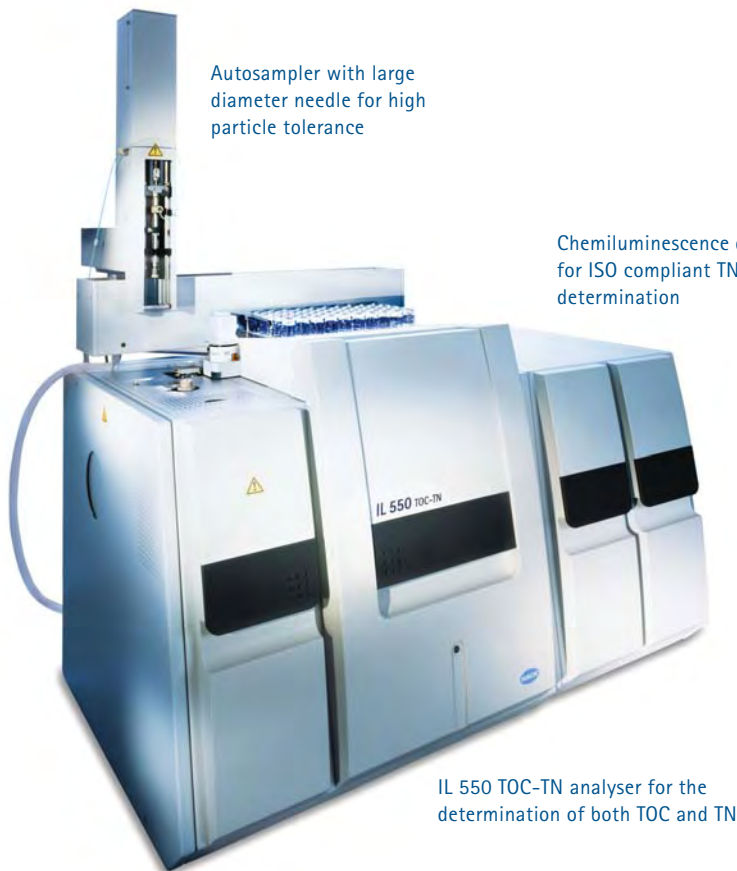
AP 300 DISCRETE  
Analysers with dual pipette system for up to 300 samples per hour  
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# TOC-TN analysers—rugged, reliable, highly accurate

- **Variable:** TOC with high temperature digestion or UV digestion
- **Reliable:** ISO compliant TOC and TN determination
- **Flexible:** TOC solids analysis in two variants for series of samples and single samples
- **Versatile:** suitable for a wide range of wastewater, drinking water, process water and quality control applications, thanks to the wide dynamic measuring range



The pneumatic port corresponds to the particle test and conforms with ISO 8254 and DIN EN 1484



Autosampler with large diameter needle for high particle tolerance

Chemiluminescence detector for ISO compliant TN determination

IL 550 TOC-TN analyser for the determination of both TOC and TN

## Getting the right result

TOC and TN, liquids and solids, particles and salt containing samples—all of them are no problem for the IL 550 TOC-TN analyser. The direct injection is carried out septum-free, without tubes or valves, through the pneumatic port, which hermetically encloses the syringe. The heat to which the needle is subjected during the analysis ensures that there is no sample carryover.

The variable injection volume enables calibration to be carried out volume-dependent, without time consuming preparation of standard solutions.

## High temperature digestion

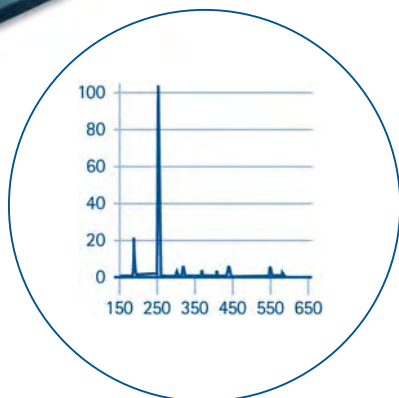
The direct injection with a 700 µm needle guarantees excellent particle tolerance. The furnace temperature of 950 °C and the optimised catalyst packing enable particle containing samples as well as the most poorly digestible substances to be oxidised completely. The long service life is assured even when it is exposed to aggressive samples.



IL 500 TOC including autosampler with two-needle technology

### Highly sensitive: TOC with UV persulphate digestion

The IL 500 TOC analyser is ideal for the low measurement range, for which samples of up to 20 ml are injected. The instrument has an exceptionally low maintenance requirement, functions without a catalyst, and incurs minimum operating costs. During UV digestion the direct contact between the sample and the UV source ensures efficient oxidation with excellent recovery and reproducibility. If an autosampler is connected, the double-needle technology allows purging and measurement to be carried out simultaneously, thus saving time.



High energy—UV digestion at 187 and 254 nm

### Overview of TOC-TN analysers

| INSTRUMENT TYPE   | IL 550 TOC-TN             | IL 530 TOC-TN             | IL 500 TOC               |
|---|---------------------------|---------------------------|--------------------------|
| TOC measuring range (NDIR)                                | 0.05–30,000 mg/l          | 0.2–30,000 mg/l           | 0.002–10,000 mg/l        |
| TN measuring range (CLD or ECD)                           | 0.1–100 mg/l              | 0.1–100 mg/l              |                          |
| Method  | HT digestion up to 950 °C | HT digestion up to 950 °C | UV persulphate digestion |
| Parameter TC/TOC/NPOC/TIC, difference or purge method     | ●                         | ●                         | ●                        |
| Signal optimisation with VITA                             | ●                         |                           |                          |
| Sample introduction                                       | Direct injection          | Injection through septum  | Flow injection           |
| DFS 950 solids module (950 °C)                            | Optional                  | Optional                  |                          |
| HSC 1300 solids module (1,300 °C)                         | Optional                  | Optional                  |                          |
| Simultaneous measurement of TOC and TN                    | Optional                  | Optional                  |                          |
| Operation with autosampler                                | Optional                  | Optional                  | Optional                 |
| Stirring at current sample position                       | ●                         | ●                         |                          |
| Simultaneous purging and measurement for determining NPOC |                           |                           | ●                        |
| Dimensions of basic TOC instrument (H x W x D)            | 512 x 540 x 530 mm        | 512 x 540 x 530 mm        | 512 x 492 x 464 mm       |

→ Accessories for TOC-TN analysers on request

# TITRALAB – Automatic titration for single and multiple samples

- RFID technology for automatic reliable reagent traceability, conforms with GLP
- Simple burette change by hand
- Fast titrant change with minimum rinsing time
- Intuitive handling through self-explanatory menus and simple method programming with a large display

Upgradable at any time—TITRALAB 960 with the single burette module can be expanded with up to four additional modules, as can the TITRALAB 965 with the double burette module (not shown)



At a glance—the large colour display shows the titration curve instantly, together with all important characteristic values



In just seconds the whole burette stand (with the burette and all titrant conducting elements) can be detached, docked in the reagent bottle to save space and stored in the rack

## The new titration systems with cable-free RFID technology

It is now simpler than ever to be 100% reliable. Cable-free and touch-free, the system identifies the inserted burette automatically, with all the necessary data – reagent name, first use, latest calibration, etc. The reliability of the measured values and the traceability of reagents can be enormously simplified with RFID. The titrants are changed together with all their conducting elements, thus avoiding any possibility of contamination and eliminating rinsing steps.

## Ready to use complete titration systems for:

### Food and beverages

- Total acid content: wine, vinegar, fruit juices, milk
- Chloride: milk, butter, other milk products
- Ascorbic acid: fruit juices, food
- Free and total SO<sub>2</sub>: wine, fruit juices

### Environment and water

- pH and alkalinity
- Total hardness
- Chloride
- COD

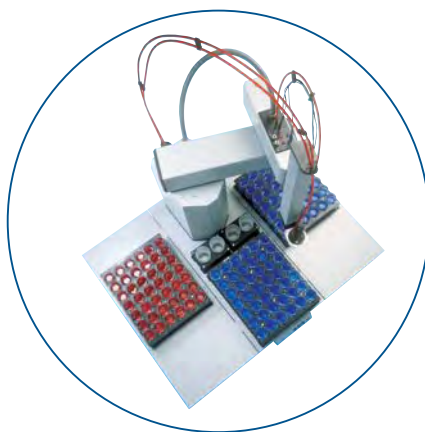
### Chemical and electroplating

- Acid-base determination in aqueous and non-aqueous media
- Imposed and zero-current redox determination
- Complexometric determinations
- Silver and precipitation determinations, petrochemical
- TAN/TBN in conformity with ASTM D664, D1159, D2896, ISO3771
- Bromine index and bromine number conforms with ASTM D1491, D7210
- Hydrogen sulphide and Mercaptans, conforms with ASTM D3227



### Wide selection of electrodes for complete titration systems

With more than 60 years of manufacturing experience, RADIOMETER ANALYTICAL stands for exceptional electrode quality. The unique RED ROD technology (see picture above) guarantees fast response times and long-term reliable and reproducible results.



### Low cost accessories and high sample throughput

The SAC90 sample changer (see picture above) processes up to 126 samples—day and night. To avoid any contamination, the electrodes are moved to the rinse beaker by a safe route, only passing over already titrated samples. The TITRAMASTER 85 PC software displays and manages the data from up to seven titrators.



### Volumetric Karl Fischer titration for water analysis

Complete Karl Fischer workstations are available on their own (TITRALAB 55) or combined with a potentiometric titrator (TITRALAB 980). At both workstations, the high-resolution burette guarantees safe and reliable measurement results with solid and liquid samples.

## Overview of the TITRALAB family

| TITRALAB                                       | 840/845 | 854/856 | 865                                       | 870 | 960/965 | 980 | 55 |
|--|---------|---------|---|-----|---------|-----|----|
| <b>Burettes</b>                                |         |         |   |     |         |     |    |
| Number of burettes                             | 1/2     | 1/2     | 2   | 2   | 1/2     | 2   | 1  |
| Additional burettes                            |         |         | 4 with 2 ABU 52 or ABU 62 double burettes |     |         |     |    |
| Burettes exchangeable with RFID identification |         |         |   |     | •       | •   |    |
| <b>Techniques</b>                              |         |         |   |     |         |     |    |
| pH/mV measurements                             | •       | •       | •   | •   | •       | •   |    |
| Endpoint titration                             | •       | •       | •   | •   | •       | •   |    |
| Inflection point titration                     | •       |         | •   | •   | •       | •   |    |
| pH-stat titration                              |         | •       |   |     |         |     |    |
| Volumetric Karl Fischer titration              |         |         |   |     |         | •   | •  |
| Conductivity measurements                      |         |         |   | •   |         |     |    |
| ISE measurements                               |         |         |   | •   |         |     |    |
| <b>Titrant addition techniques</b>             |         |         |   |     |         |     |    |
| Continuous dynamic                             | •       | •       | •   | •   | •       | •   |    |
| Incremental monotonic and dynamic              | •       |         | •   | •   | •       | •   | •  |
| <b>Peripherals</b>                             |         |         | Samplers, balance, printer, PC software   |     |         |     |    |
| <b>Electrode inputs for</b>                    |         |         |   |     |         |     |    |
| Indicator electrodes                           | 1       |         |   |     | 2       |     | 1  |
| Reference electrodes                           |         |         |   |     | 1       |     |    |
| Polarised electrode                            |         |         |   |     | 1       |     |    |



More information at [www.hach-lange.co.uk](http://www.hach-lange.co.uk), [www.hach-lange.com](http://www.hach-lange.com), keyword "TITRALAB", with free downloads of brochures and User Manual as well as information about ordering TITRALAB workstations, reagents and electrodes.

→ In some countries, these systems are distributed by specialised partners. Your HACH LANGE contact will provide you with further information.

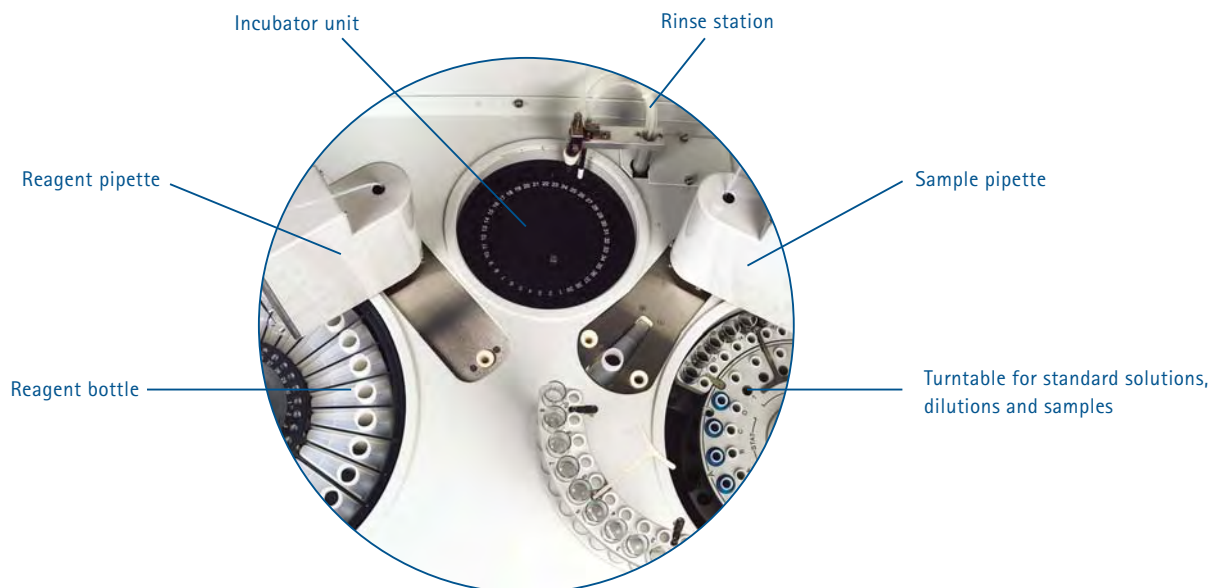
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# AP 300 DISCRETE analyser – compact ion analysis

- Flexible use – several parameters per sample, simultaneously
- Cost savings – low reagent volumes from 10 to 300 µl
- User friendly – intuitive menu guidance and preprogrammed methods
- High measurement frequency – up to 300 tests per hour
- Reliable results thanks to dual pipette system



AP 300 DISCRETE: Fully automatic ion analyser for environmental analysis, complemented by high quality, ready-to-use reagents



## Ready-to-use reagents for the AP 300 DISCRETE analyser

| PARAMETER                             | MEASURING RANGE                   | METHOD                   | METHOD NO.      | ART. NO. |
|---------------------------------------|-----------------------------------|--------------------------|-----------------|----------|
| Ammonium, non-acid-stabilised samples | 0.03–2.00 mg/l<br>1.00–20.0 mg/l  | Berthelot                | D-10-107-06-1-A | 52921    |
| Ammonium, acid-stabilised samples     | 0.03–2.00 mg/l<br>1.00–20.0 mg/l  | Berthelot                | D-10-107-06-1-B | 52918    |
| Chloride                              | 1.00–50.0 mg/l<br>25.0–300 mg/l   | Thiocyanate              | D-10-117-07-1-A | 52926    |
| Cyanide                               | 0.02–0.50 mg/l                    | Pyridine barbituric acid | D-10-204-00-1-A | 52925    |
| Nitrate, nitrite                      | 0.75–20.0 mg/l                    | Sulphanilamide           | D-10-107-04-1-A | 52920    |
| Nitrate, nitrite                      | 0.04–0.75 mg/l                    | Sulphanilamide           | D-10-107-04-1-B | 52919    |
| Phosphorus, ortho                     | 0.10–2.00 mg/l<br>0,015–1,00 mg/l | Molybdate                | D-10-115-01-1-A | 52923    |

# Efficiency and high sample throughput with FIA – QUICKCHEM 8500

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- Time-saving thanks to method-specific, ready-to-use reagents
- Immediately ready for use
- Method changeover in minutes
- Automatic elimination of gas bubbles in the sample
- Alarm function to detect for leaks
- Multilingual operating software

## Maximum productivity

The FIA technology significantly improves traditional methods such as SFA (segmented flow analysis) and has been developed further and proved to be a cost effective analysis method for water and environment laboratories, that process large numbers of samples. The comprehensive measuring ranges for a wide range of parameters, make FIA an essential analysis tool, for all types of water. Twenty years of practical experience went into the development of QUICKCHEM 8500.



QUICKCHEM 8500—flow injection analysis for 120 samples per hour

## QUICKCHEM methods without sample preparation

| PARAMETER | READY-TO-USE REAGENTS AVAILABLE | WASTEWATER, DRINKING WATER | SEA WATER | SOIL |
|-----------|---------------------------------|----------------------------|-----------|------|
| Ammonium  | ●                               | ●                          | ●         | ●    |
| Nitrate   | ●                               | ●                          | ●         | ●    |
| Nitrite   | ●                               | ●                          | ●         | ●    |
| Chloride  | ●                               | ●                          |           |      |
| Chromium  |                                 | ●                          |           |      |
| Cyanide   | ●                               | ●                          |           |      |
| Silica    | ●                               | ●                          | ●         |      |
| Aluminium | ●                               | ●                          |           | ●    |
| Iron      | ●                               | ●                          | ●         |      |
| Manganese |                                 | ●                          | ●         | ●    |
| Phosphate | ●                               | ●                          | ●         | ●    |
| pH        |                                 | ●                          |           |      |

## QUICKCHEM methods with integrated sample preparation\*

| PARAMETER                | DIGESTION METHOD                            |
|--------------------------|---|
| Cyanide, inline          | UV high temperature                         |
| Phenol, inline           | Gas diffusion, then condensation            |
| Detergents, anionic      | Single or double extraction with chloroform |
| Total nitrogen, inline   | UV persulphate                              |
| Total phosphorus, inline | UV persulphate                              |
| Sulphide, inline         | Distillation                                |

\* Alternative: external sample preparation with the MICRODIST digestion system—a heating block which can accommodate 21 prepared digestion tubes. More information available on request

- More than 400 standard and other methods available. Method manuals (in English) available on request

# Automatic laboratory analysers with integrated digestion – GANIMEDE P and N

- Results in minutes for total P and TN<sub>b</sub>
- Integrated fast digestion
- Ready-to-use reagents
- Portable control unit
- Simple handling



Specific analysis units with integrated digestion or total P and TN<sub>b</sub>

## Flexible, intelligent data management

The GANIMEDE system, consisting of a sample changer, control unit and analysis units with integrated digestion for N or P, makes it possible to work flexibly at different measuring stations. The cordless control unit communicates with one or both analysis units. Sample data is acquired via the barcode scanner or a PC and processed by the control unit.

## Reliable results in minutes – for efficient digestion

The integrated high temperature digester, with fast cooling feature, delivers precise and quick results. Even complex phosphate or nitrogen compounds are completely digested and processed in four to seven minutes; analogous to EN 1189 (phosphate) or ISO 11905-1 (nitrogen).

## GANI CHEM ready-to-use reagents

The time consuming preparation of reagent solutions is a thing of the past. High quality, easy to handle GANI CHEM reagents can be used for up to 100 determinations. Used reagents are safely and conveniently disposed of by HACH LANGE.

### Technical data for GANIMEDE P

|                        |   |
|------------------------|---|
| Measurement method     | Analogous to EN 1189  |
| Measuring range        | 0.01 – 3.8 mg/l PO <sub>4</sub> -P  |
| Repeatability          | At 1 mg/l: ± 2%   |
| Measurement wavelength | 880 nm  |
| Calibration            | Autom. 2-point, optional standard series  |
| Sample turntable       | 36 x 30 ml and 53 x 15 ml   |
| Interfaces             | 1 serial, 1 parallel, 1 sample changer  |
| Power requirement      | 230V/50 Hz (optional 110V)  |
| Colour display         | 5.7 inch; IR interplay  |
| Reagent kit            | GANI CHEM P for automatic phosphate analysis, measurement range 0.01-3.8 mg/l P, 100 determinations, article no. GCA100 |

### Technical data for GANIMEDE N

|                        |  |
|------------------------|--|
| Measurement method     | Analogous to EN ISO 11905-1  |
| Measuring range        | 0.5 – 150 mg/l TN <sub>b</sub>   |
| Repeatability          | At 10 mg/l: ± 2%   |
| Measurement wavelength | 210 nm   |
| Calibration            | Autom. 2-point, optional standard series   |
| Sample turntable       | 36 x 30 ml   |
| Interfaces             | 1 serial, 1 parallel, 1 sample changer   |
| Power requirement      | 230V/50 Hz (optional 110V)   |
| Colour display         | 5.7 inch; IR interface   |
| Reagent set            | GANI CHEM N for automatic determination of total nitrogen, measuring range 0.5-150 mg/l TN <sub>b</sub> , 100 determinations, article no. GCA200 |

- Sample changer for GANIMEDE: see page 81, more accessories available on request