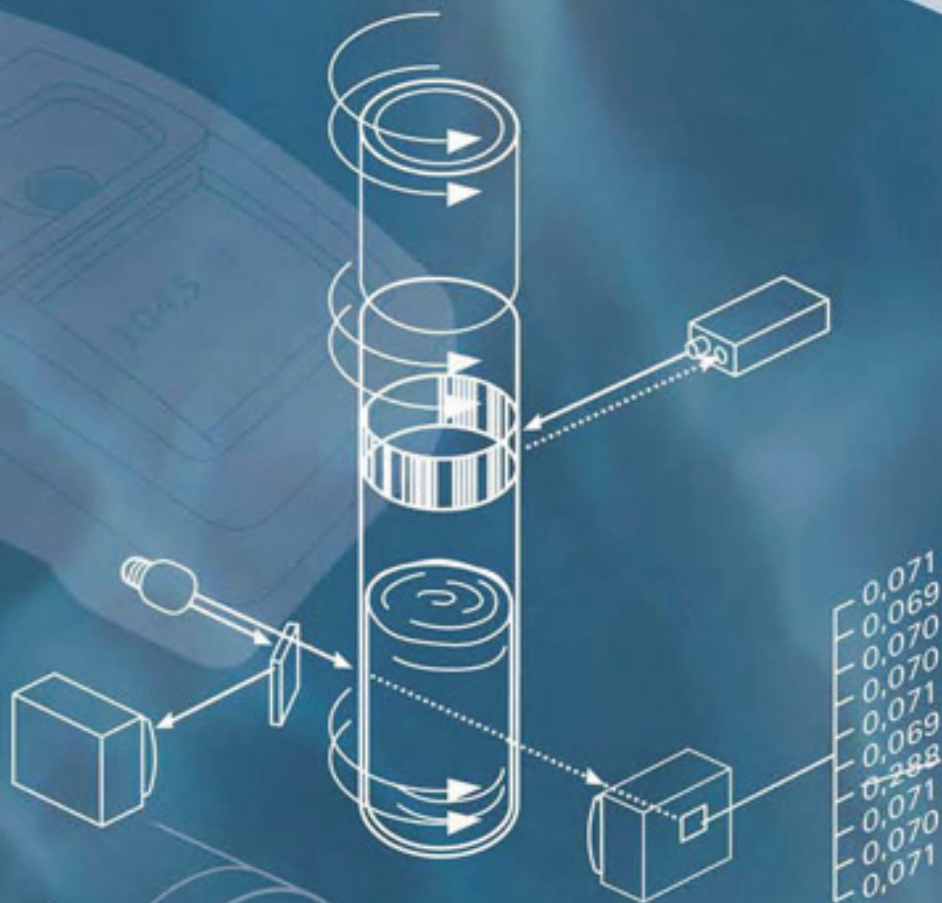


**WASTEWATER
DRINKING WATER
PROCESS WATER**



**LABORATORY ANALYSIS
LABORATORY AUTOMATION
SAMPLERS
PROCESS MEASUREMENT**

**CATALOGUE
2009**

Distributed by:

Greyhound Chromatography and Allied Chemicals

6 Kelvin Park, Birkenhead, Merseyside CH41 1LT United Kingdom

Tel: (+44) 0 151 649 4000 Fax: (+44) 0 151 649 4001

Email: sales@greyhoundchrom.com

www.greyhoundchrom.com



UNITED FOR WATER QUALITY

Welcome!

New demands and technologies continuously spur us on to develop new and better solutions to the problems you encounter in everyday analysis.

The proof of this can be found in our latest catalogue. Amongst our wide range of market leading products you will find:

- An impressively large selection of photometric methods for the laboratory, with the latest in Spectrophotometry; the DR 2800 and DR 5000
- Outstanding measuring reliability and flexibility for pH and oxygen with the new digital HQD systems
- A wide range of applications for the new TOC automatic laboratory analysers
- Reliable solutions from the new process analysers for N and P parameters
- Innovative new telemetry service for process measurement technology
- Latest technology for monitoring the quality of surface water

All this and more – take a look for yourself!

The ideal team for water analysis



On-site support



Technical support and orders



Seminars and workshops



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Quality assurance



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Customer information



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RADIOMETER ANALYTICAL

SIGMA

Introduction

Chapter

Parameters, wastewater, drinking water, process water, service, water quality	Page 4	1
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Laboratory analysis

Chapter

<p>HACH LANGE laboratory solutions ensure accurate and reliable analysis for all parameters in the municipal, regulatory and industrial sectors. In the lab and in the field.</p>	OVERVIEW	Page 16	2
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Laboratory automation

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Samplers

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HACH LANGE solutions for stationary and portable sampling	SAMPLERS	Page 91	10
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Process Measurement Technology

Chapter

<p>HACH LANGE process solutions for drinking water, wastewater and industrial treatment systems and industry. Providing reliable instrumentation, cost effectively.</p>	OVERVIEW	Page 95	11
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Reference

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Practical solutions— parameter by parameter

The HACH LANGE product range covers the complete spectrum of parameters in water analysis. From wastewater, drinking water to process water. Whether in the lab or in the field. We have the right solutions for you.



O₂, pH, conductivity

Dissolved oxygen concentration influences wastewater purification more than any other parameter. Its precise measurement is of major technical and economic significance. The pH and redox values of wastewater and drinking water are essential for the assessment of many other parameters and process steps. The conductivity of water provides information about its salt content.

In view of the importance of these parameters, HACH LANGE has developed an extensive range of products using its outstanding advanced technologies.

- **Laboratory analysis:** see page 16
- **Process measurement technology:** see page 95



Turbidity and sludge

Clear water is the desired end product of wastewater and drinking water treatment. Suspended solids and particles can effect the end product and may also interfere with the process. The determination of turbidity is therefore an important task. The central role of active sludge in the wastewater treatment process needs careful monitoring: with parameters such as the solids concentration, sludge volume, sludge index and sludge level, HACH LANGE has a comprehensive range of products for determining the lowest to the highest solids content as well as key sludge properties.

- **Laboratory analysis:** see page 16
- **Process measurement technology:** see page 95



Sum parameters

COD, TOC, SAC, BOD and AOX provide no direct information about individual substances, but are sum parameters which indicate, for example, the chemical or biological oxygen-consuming capacity or UV absorption of water. HACH LANGE sum parameters offer perfect solutions, easy handling, including proven, fast digestions. For TOC analysis, HACH LANGE offers everything from individual analysis in the laboratory to on-site process analysis.

- **Laboratory analysis:** see page 16
- **Laboratory automation:** see page 83
- **Process measurement technology:** see page 95



Nutrients

Nitrogen and phosphorus compounds are not toxic, but encourage the growth of algae in surface waters, which results in oxygen depletion. The elimination of ammonium, nitrite, nitrate, total nitrogen, orthophosphate and total phosphate plays a key role in wastewater treatment processes. In the analysis of drinking water, special attention is paid to nitrite and nitrate as potential precursors of carcinogens. HACH LANGE nutrient analysis covers all parameters, and makes use of fast and effective digestion methods.

- **Laboratory analysis:** see page 16
- **Laboratory automation:** see page 83
- **Process measurement technology:** see page 95

WW

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Wastewater

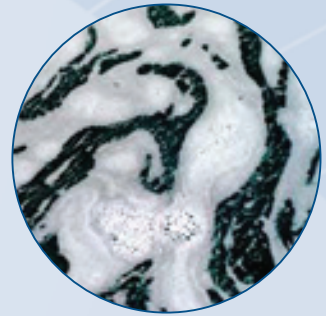
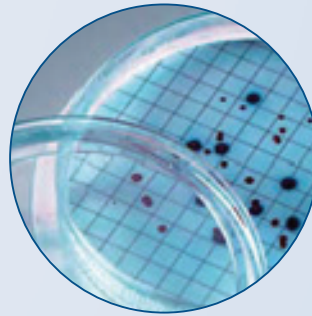
Made-to-measure solutions for wastewater analysis in the municipal and industrial sectors

Drinking water

Dependable analysis for providers and users

Process water

Process and laboratory analysis for special analytical problems

**Chlorine**

Disinfectants are used to eliminate microorganisms from drinking water and recreational water. Besides chlorine, products such as chlorine dioxide, ozone, iodine and bromine are used. Careful analysis of these substances is not just advisable on economic grounds. It is essential, since disinfectants and their reaction products are associated with risk potential. From paddle testers through to quality controlled laboratory analysis and analysers for process control applications, HACH LANGE has a complete range of products for disinfection analysis.

- **Laboratory analysis:** see page 16
- **Process measurement technology:** see page 95

Metals

Many metals from industrial processes may be present in wastewater. Metals may also be present in drinking water due to geological circumstances and corroded pipes. Although the toxicity of metals varies widely, they are all rated as having a very high risk potential. Metals are not biodegradable and therefore accumulate in activated sludge systems. Metals are usually present in water samples in complex forms, so a special sample preparation has to be carried out before the analysis can be performed. HACH LANGE metal analysis covers all relevant parameters, from aluminium, copper and nickel to zinc.

- **Laboratory analysis:** see page 16

Microbiology

Bacteria, fungi and other microorganisms in drinking water and recreational water can be a cause of disease, while in industrial plants they may form troublesome coatings. The HACH LANGE range of products enables quantitative and qualitative microbiological tests of surfaces and water to be carried out in conformity with legal requirements. Ready-to-use tests, media and accessories are available, together with a variety of methods, e. g. membrane filtration, MPN, Presence/Absence, BART and paddle testers. In contrast, the luminescent test uses bacteria as a tool to determine the toxicity of water and soil.

- **Laboratory analysis:** see page 16

Other parameters

Special parameters need to be analysed in water for many reasons, such as monitoring a process or a legally specified value—cyanides or surfactants in industrial wastewater, organic acids in aeration tanks, biogas fermenters and digesters, hardness in drinking water, chloride, sulphate and silica in water treatment systems, colour values such as iodine, Hazen and Gardner in industrial quality control, and many others. HACH LANGE can supply a comprehensive range of products for a variety of parameters and needs.

- **Laboratory analysis:** see page 16
- **Process measurement technology:** see page 95

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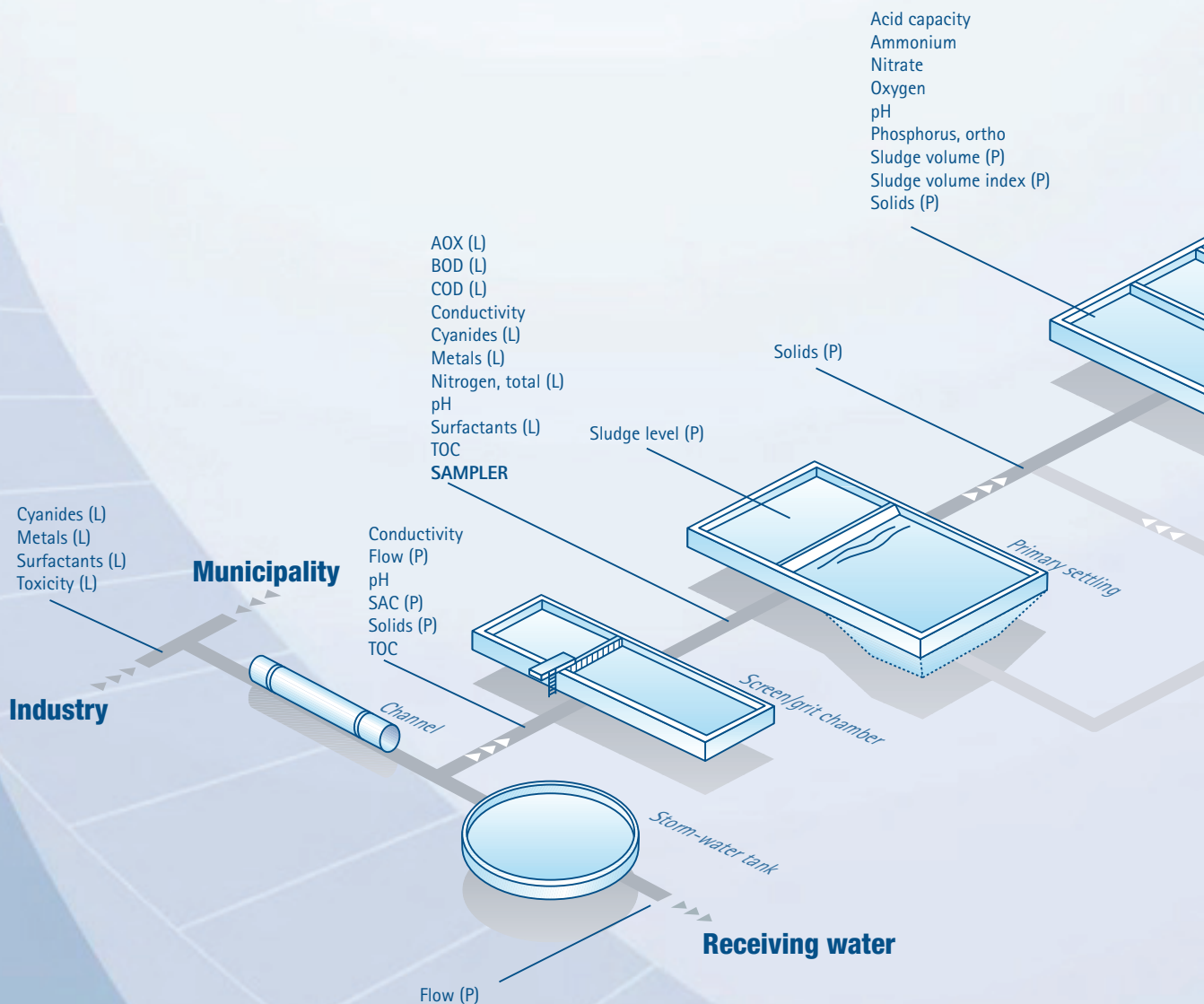
For municipal and industrial users— HACH LANGE wastewater analysis

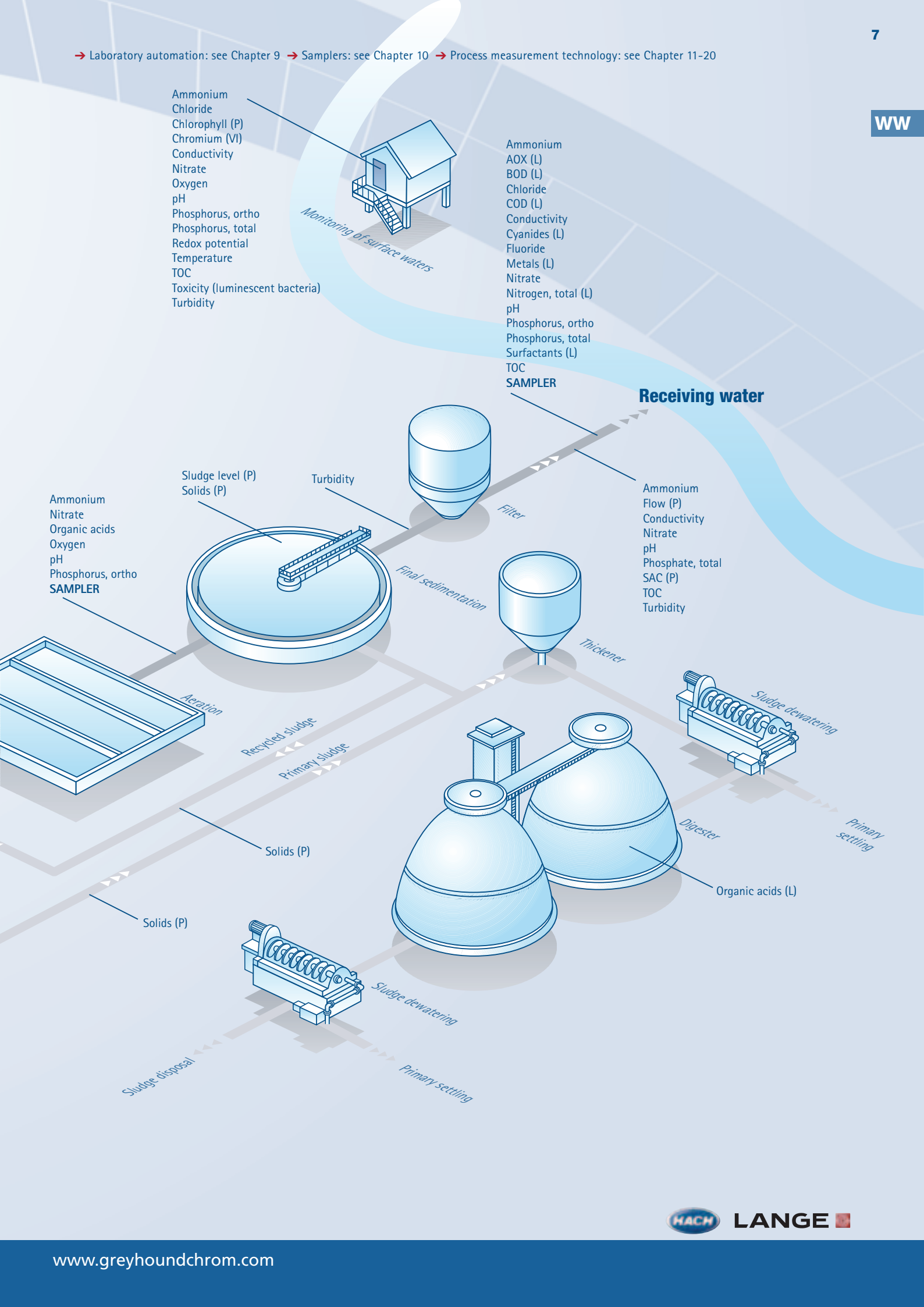
Wastewater is one of the main waste products of our society. To ensure that it can be returned to the natural water cycle without harming the environment, producers of wastewater are obliged to comply with certain minimum requirements. Threshold values can only be monitored correctly and treatment processes can only be controlled economically with the help of accurate and reliable analysis.

HACH LANGE wastewater analysis is the result of decades of practical experience. Innovative solutions for a wide range of parameters in the industrial and municipal sectors.

(L) laboratory only

(P) process only





- Ammonium
- Chloride
- Chlorophyll (P)
- Chromium (VI)
- Conductivity
- Nitrate
- Oxygen
- pH
- Phosphorus, ortho
- Phosphorus, total
- Redox potential
- Temperature
- TOC
- Toxicity (luminescent bacteria)
- Turbidity

- Ammonium
- AOX (L)
- BOD (L)
- Chloride
- COD (L)
- Conductivity
- Cyanides (L)
- Fluoride
- Metals (L)
- Nitrate
- Nitrogen, total (L)
- pH
- Phosphorus, ortho
- Phosphorus, total
- Surfactants (L)
- TOC
- SAMPLER**

Receiving water

- Ammonium
- Nitrate
- Organic acids
- Oxygen
- pH
- Phosphorus, ortho
- SAMPLER**

- Sludge level (P)
- Solids (P)

Turbidity

Filter

Final sedimentation

Thickener

- Ammonium
- Flow (P)
- Conductivity
- Nitrate
- pH
- Phosphate, total
- SAC (P)
- TOC
- Turbidity

Aeration

Recycled sludge
Primary sludge

Solids (P)

Sludge dewatering

Digester

Organic acids (L)

Primary settling

Solids (P)

Sludge dewatering

Sludge disposal

Primary settling

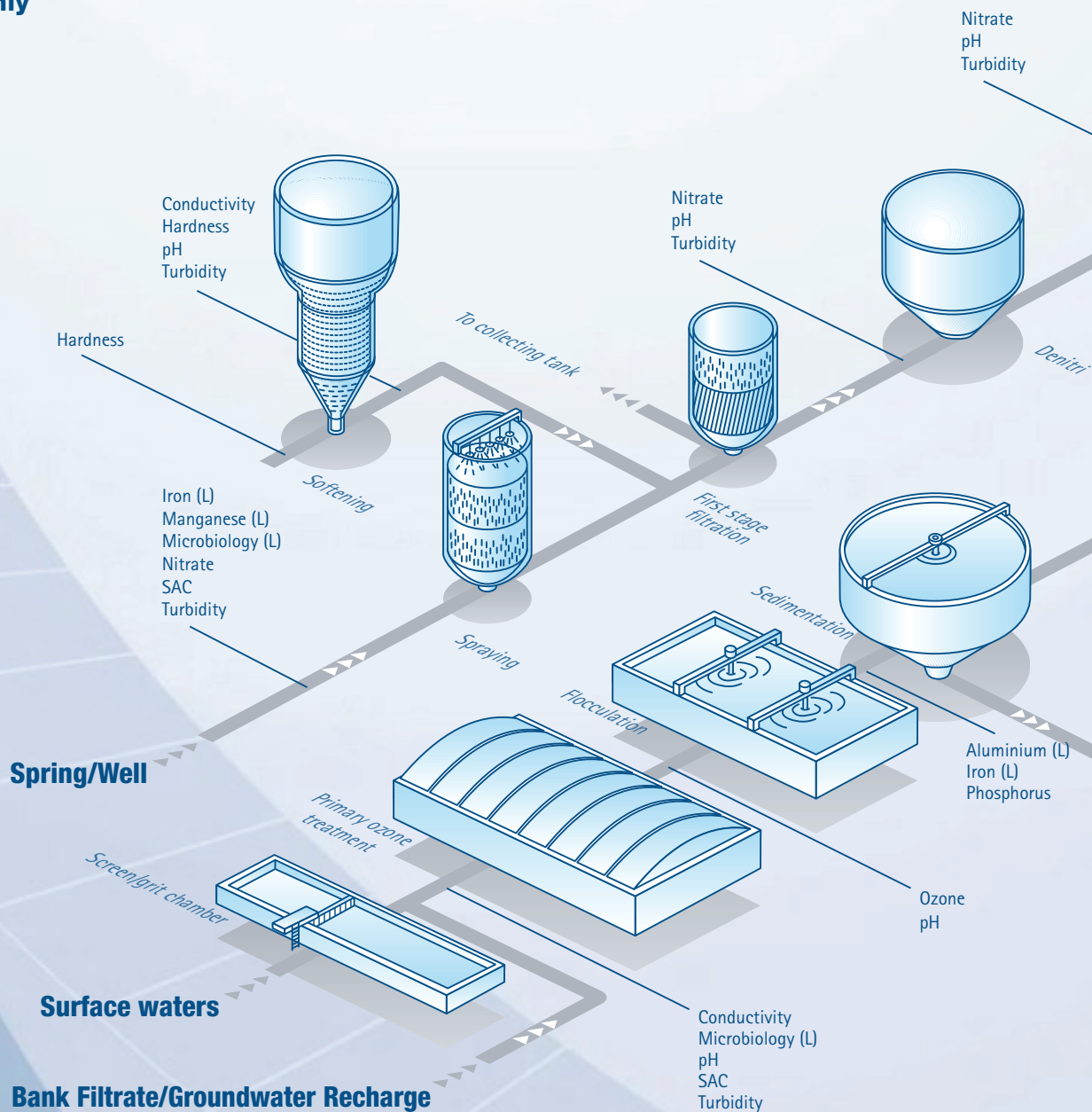
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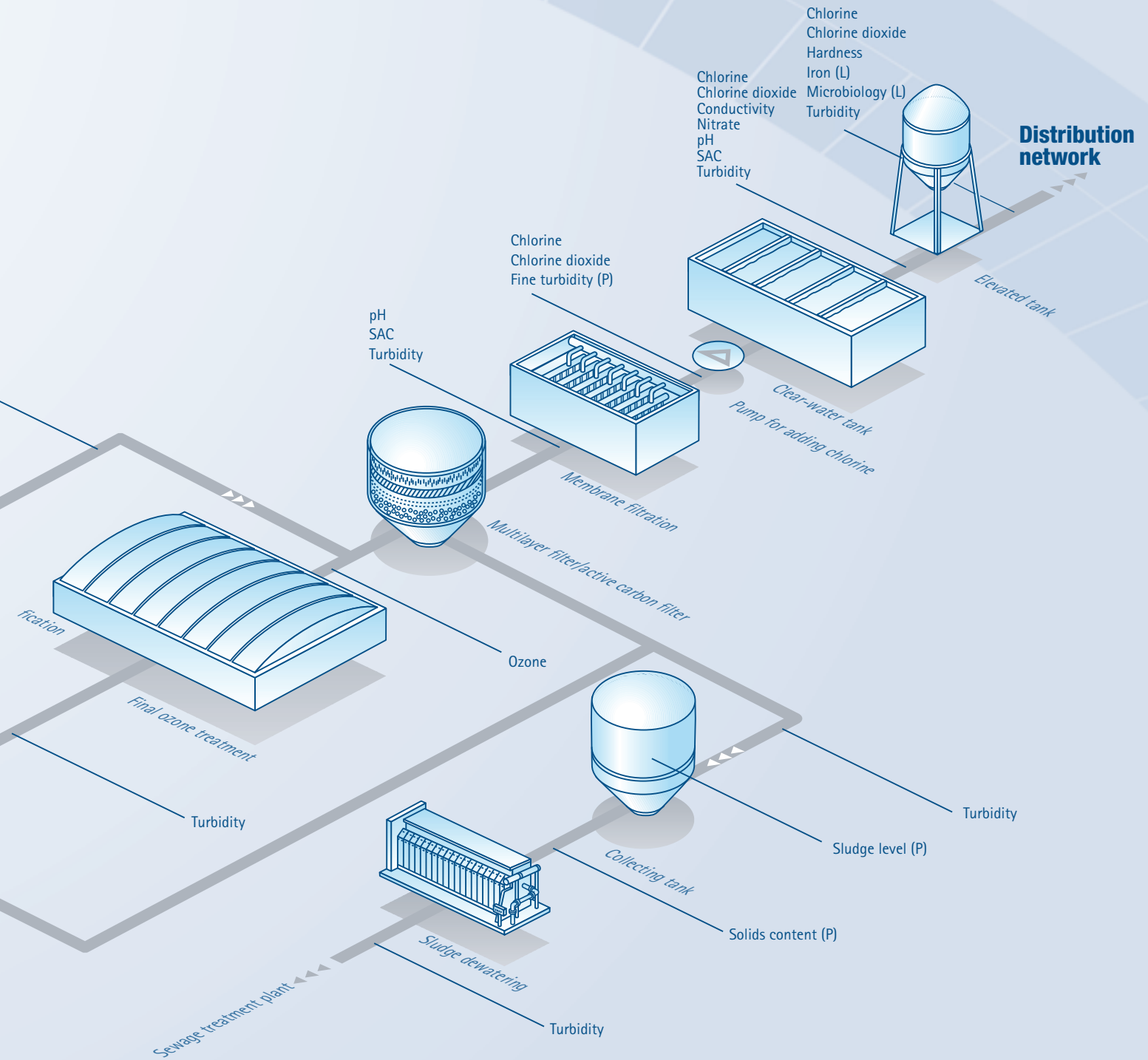
HACH LANGE drinking water analysis— solutions for suppliers and consumers

Drinking water is essential to human life. Consumers and suppliers alike expect it to be of the highest quality and legislation dictates this. HACH LANGE is an expert with years of experience in drinking water analysis. We provide proven solutions for all relevant parameters in the field, in the laboratory or process control. Drinking water analysis solutions from HACH LANGE gives you confidence in drinking water treatment and use.

(L) laboratory only

(P) process only





PW

HACH LANGE process water analysis— solutions for industry

The control of industrial production processes is under scrutiny from many sides. Not just from companies themselves, but also customers and legislators. Verified data is needed about product quality, energy consumption and operating procedures, etc. Only practice related and reliable analysis can supply this data. HACH LANGE offers an extensive programme of analytical solutions for industry, e.g. for widely varied applications such as cooling and boiler water, but also for special areas in a variety of industrial sectors.

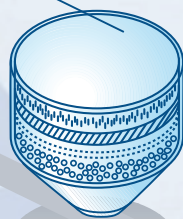
(L) laboratory only

(P) process only

Acid capacity	Molybdenum (L)
Alkalinity	Nitrite
Ammonium	Oxygen
Chloride	pH
Chlorine	Phosphonate
COD (L)	Phosphorus
Copper (L)	SAC (P)
Conductivity	Silica
DEHA (L)	Sodium
Hardness	Sulphite
Hydrazine	TOC
Iron (L)	Toxicity (L)
	Turbidity

Chlorine
Conductivity
Hardness
pH
Oxygen
Silica
Turbidity

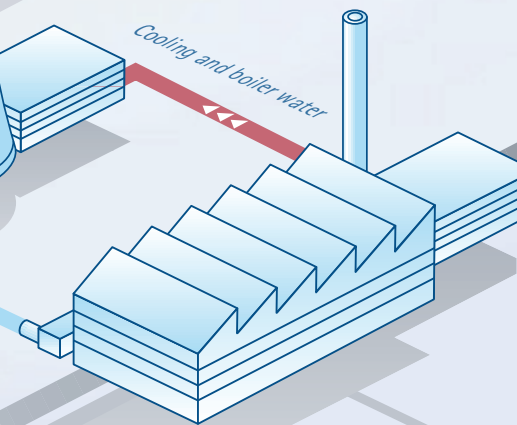
Receiving water



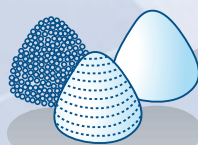
Water conditioning



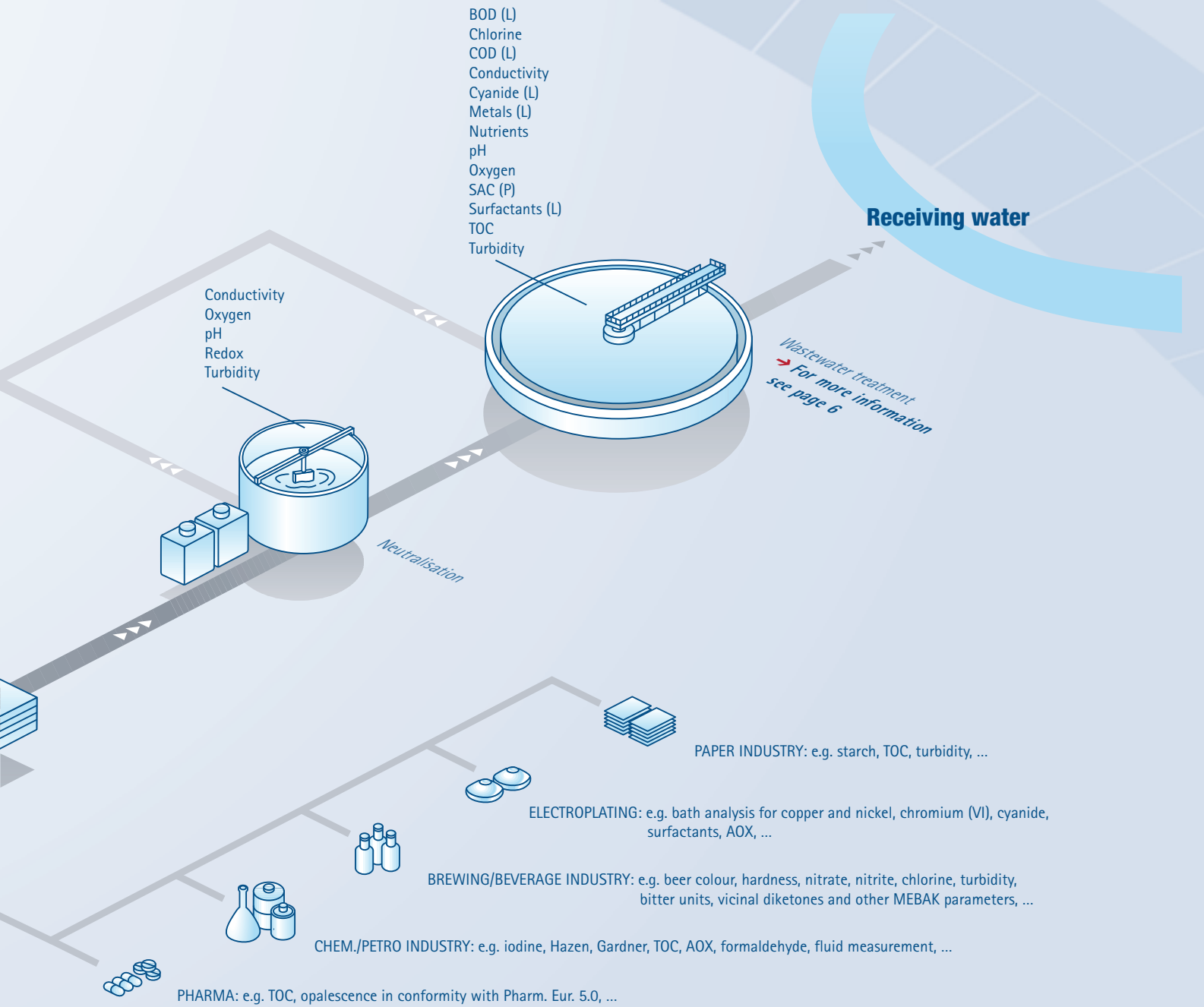
Cooling and boiler water



Production

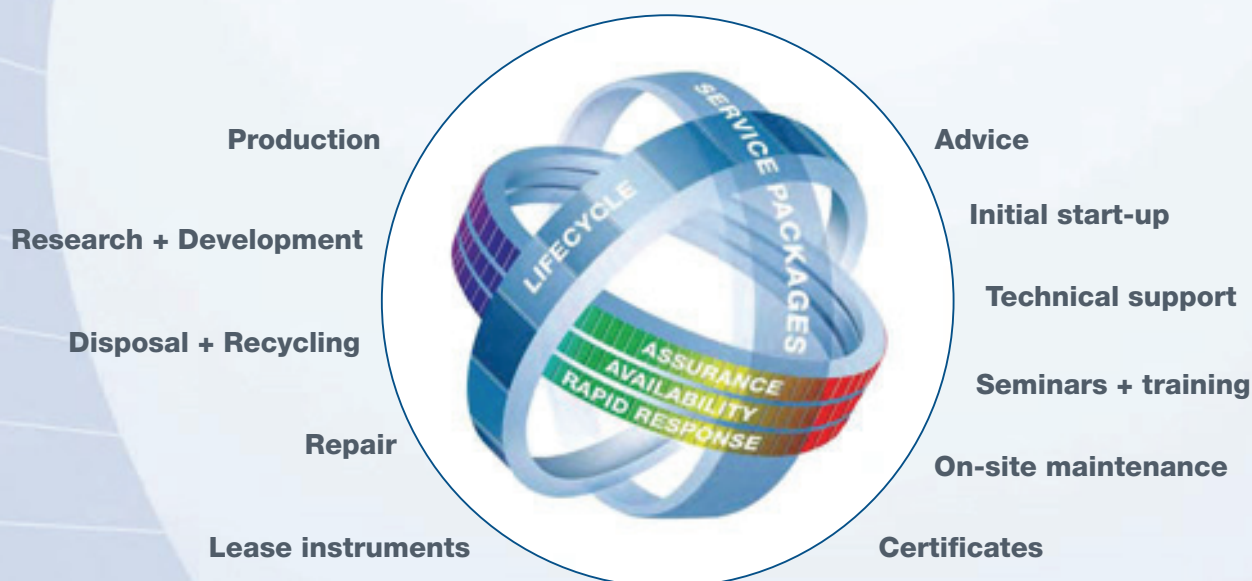


Raw materials



Service Solutions – flexible packages

Our customers depend on the availability of reliable analytical data at all times. HACH LANGE supports the use of its instruments throughout their life cycle, from initial start-up to disposal. Drawing on decades of practical experience, HACH LANGE has developed comprehensive service packages to suit customers needs. Flexible service packages provide the necessary assurance for smooth operation of the instrument.



Start-up service package: Initial start-up + Commissioning

From the very first day our qualified staff will offer support during commissioning. We provide documentation for quality assurance purposes and for the reliable operation of the measurement systems.

Service Package 1: One-off Inspection

Flexible assurance without contractual ties: ensuring a high level of continuity with the instruments thanks to replacement of wear parts or repairs as necessary.



Service Package 2: Inspection + Maintenance

60 month warranty period: regular inspections of the instruments in line with the maintenance contract. For a long instrument life and reliable operation with no hidden costs; call-out, labour and spare parts are included.

Service Package 3: Service-Plus contract

On-site service plus teleservice for SC-based process measurement technology: service engineer call-out as required and as scheduled in the maintenance contract. Plus round-the-clock monitoring; to keep up to date at all times with event reports by SMS.





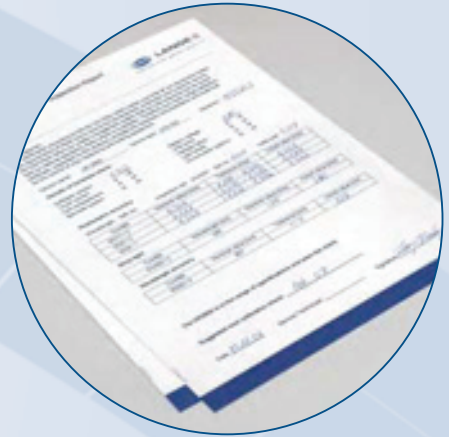
Face to face—personal support from the very first day

Initial start-up and thorough instruction by qualified engineers are part of the course with HACH LANGE service. We ensure that you have a comprehensive knowledge of operating and maintenance of the instruments.



Documented service—documented quality

With regard to the monitoring of measurement and test equipment, verification of operational processes and comprehensive internal quality management. HACH LANGE provides all documentation required by DIN ISO 9001:2000.



Tested on site—for example the inspection report

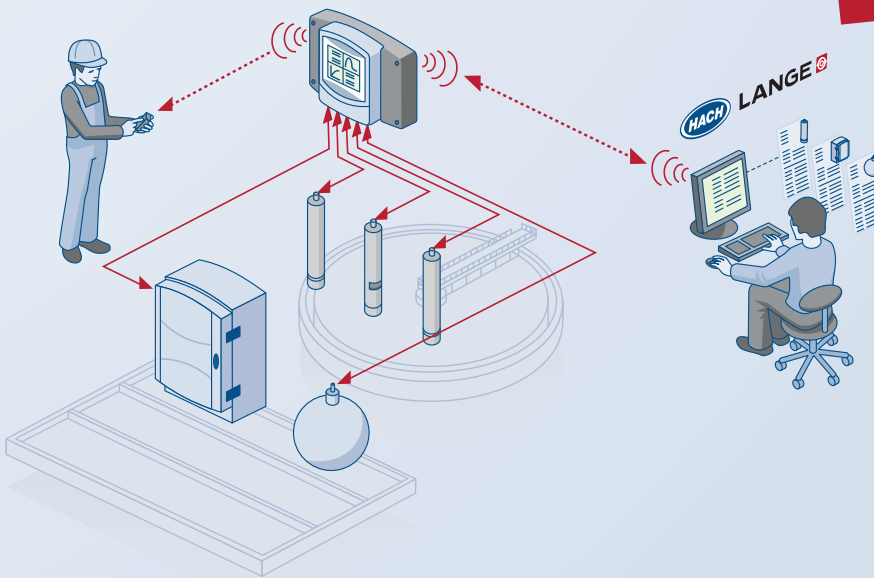
Regular and preventive inspections are fully traceable through individual inspection reports. The HACH LANGE flexible service contracts give customers the satisfaction of having done everything to ensure correct set up of the instrument on site.



NEW!

Teleservice—the new SC-based service

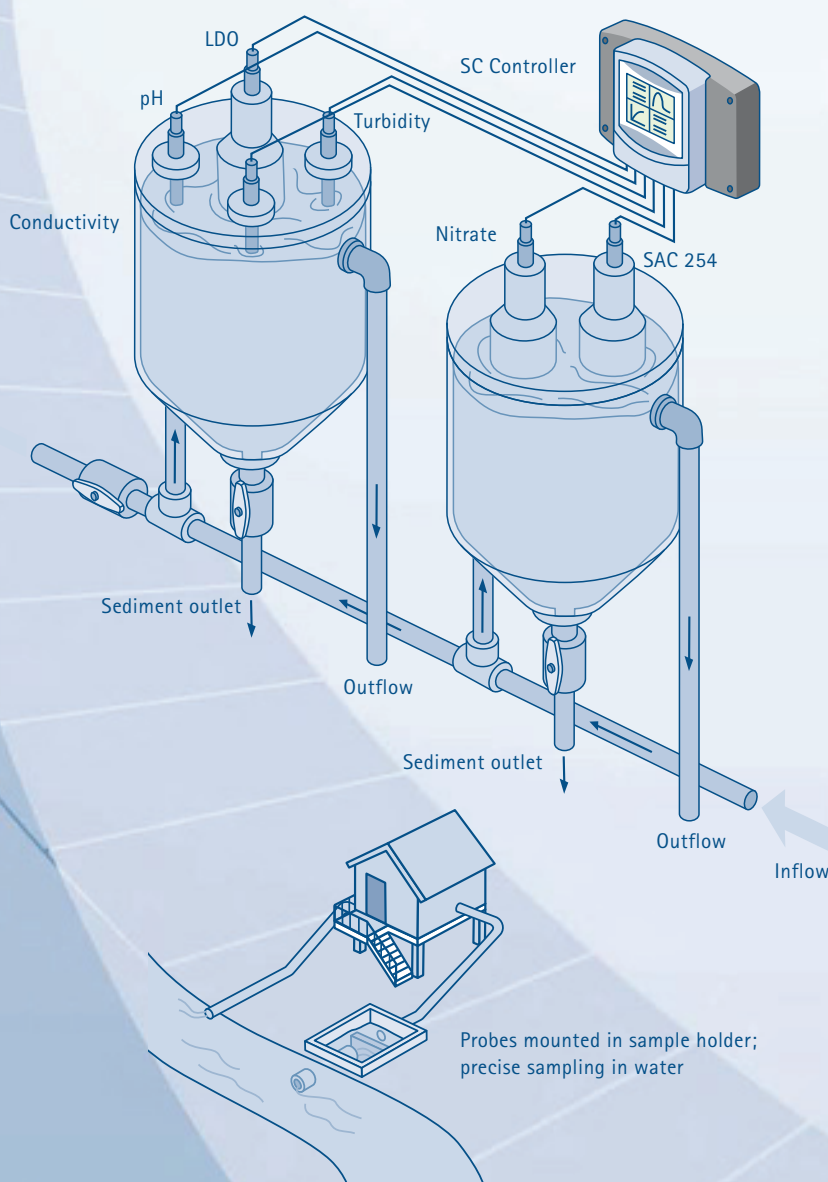
24 hours a day, 7 days a week: the SC 1000 controller informs the appropriate personnel about the connected SC process sensors by SMS. At the same time, the event or alarm messages are sent to the HACH LANGE Teleservice Centre for analysis by skilled engineers. If necessary, they contact you by phone or intervene directly to take corrective action. Plant visits can also be prepared more efficiently, so the engineer has all the necessary parts with him. Quick and convenient way of reporting faults, ensuring the continued operation of the instruments.



Service Support – for more information about HACH LANGE Service go to www.hach-lange.co.uk, www.hach-lange.com

Total solutions for monitoring water quality

- Comprehensive measurement stations; stationary and portable
- Made-to-measure analysis equipment
- Remote diagnosis and data transmission via GSM
- For industrial monitoring that conforms with the IPPC Directive



EU monitoring Regulations from 2006

The timetable for the implementation of the European Water Framework Directive requires the EU member states to have programmes in place by the end of 2006 for monitoring river basins. The aim of the monitoring is to catalogue the current water quality for the desired restoration of the river basin to a good ecological condition. The regional authorities responsible for river basins have been given the task of implementing the programmes.

Simple implementation with turnkey equipment

As an experienced producer of water analysis systems, HACH LANGE can offer a comprehensive service. Monitoring stations are individually planned and constructed, and the equipment covers all the necessary parameters. The physical, chemical and biological measurement systems have proven themselves in all kinds of applications. The service includes the complete delivery of power. The turnkey solution from HACH LANGE helps companies implement the EU directive.

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11–20



Measurement station, built to specification and fully equipped



Stationary industrial container, available in a variety of versions



Pump in operation. Depending on its location, submersible or pressure pump

Turnkey total solutions—possible configurations

Characteristics	DREL mobile laboratory; ready to use equipment; mains/independent power instruments; reagents and accessories	Mobile measurement container (independent power optional)	Stationary measurement station with power supply and telephone connection
Parameters	e.g. Acidity, Iron, Alkalinity, Manganese, Ammonium, Molybdenum, Bromine, Nitrate, Calcium, Nitrite, Chloride, Phosphorus, Chlorine, Silica, Chromium (VI), Sulphate, Colour, Sulphide, Copper, Sulphite, Hardness, Suspended solids Iodine,	Sensors for continuous analysis: • Chlorophyll • Conductivity • Nitrate • Oil in water • Oxygen • pH • SAC 254 • Solids concentration • Temperature • Turbidity	As in the previous column, as well as: • Ammonium • Flow • Level measurement • Luminescent bacteria test in compliance with DIN EN ISO • Phosphorus (total and ortho) • Rainfall • TOC
Sample delivery	Manual	Submersible pump Pressure pump Suction pump	Submersible pump Pressure pump Suction pump
Data communication	USB memory stick	GSM	GSM, optional dedicated line

→ Details of the sensors and instruments for process measurement technology and laboratory analysis can be found on the following pages

→ For more information about DREL portable laboratories see page 38



SC 1000 Controller:
a maximum of eight SC probes can be connected
→ For more information see page 98



More information at www.hach-lange.co.uk,
www.hach-lange.com, keyword "Water quality"

HACH LANGE laboratory analysis—from a single measurement to continuous analysis

HACH LANGE's product range for laboratory analysis is as extensive as water analysis itself. Its trade mark is well designed, integrated systems, with consumables, quality control and accessories for more than 100 parameters. HACH LANGE has created all that is needed for accurate results in the laboratory and in the field. HACH LANGE laboratory analysis—you can rely on us.

Laboratory automation
Complete measurement systems for continuous analysis
→ See page 83



VIS and UV-VIS photometers
From small single parameter colorimeters to UV-VIS spectrophotometers
→ See page 29



pH, conductivity, oxygen, redox
Electrochemical measurement systems, electrodes and accessories
→ See page 18



Versatile
Portable, environmental laboratories, completely equipped for a variety of applications
→ See page 30



Well designed: That's what makes the HACH LANGE range of laboratory products so special.

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20

Measurement technology

- Single measurement or continuous analysis, in the laboratory or on site—the right measurement technology is available for every application

Reagents

- For all key parameters from ammonium to zinc. From a fast screening test to standard-comparable analysis, with sample preparation and quality assurance



Services

- On-site support
- Service + maintenance
- Disposal + recycling
- Website with downloads and e-shop
- Regular customer information
- Seminars + workshops
- Technical support

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The HACH LANGE system for water analysis



Reagents

- Visual tests, photometric reagents and standards for quality control
- See page 41



Turbidity

- USEPA and ISO-compatible measurement instruments; prepared standards with long-term calibration stability
- See page 73



Accessories

- Spectrophotometer/photometer accessories, sample preparation, peripherals
- See page 78

pH, redox, conductivity, oxygen – every application in the laboratory and the field

In the treatment of wastewater, drinking water and quality assurance, pH is the basis for all analysis. Conductivity and oxygen also play a key role in numerous applications, both in the field and in the laboratory. Because these parameters are so widely used, manufacturers must be able to offer a wide range of products to satisfy all needs. This is where HACH LANGE, a market leader, with more than 50 years of experience and three innovative productlines, with meters, electrodes and accessories.



HQD/INTELLICAL products → See page 19



SESSION products → See page 24



METERLAB products → See page 26

Digital data for confidence in field and laboratory

HQD measuring instruments and INTELLICAL electrodes use digital technology to give you confidence in your results. Digital technology provides enormous flexibility and error-free handling, e.g. by saving the calibration data in the intelligent electrodes. INTELLICAL electrodes are available for all electrochemical parameters in a variety of configurations, with calibration-free LDO sensors for measuring O₂.

Proven technology for a wide range of applications

SESSION meters and electrodes for pH, conductivity and dissolved oxygen have proven their worth in many water analysis applications. They have a rugged construction, easy handling and give reliable readings. With a tried and tested range of electrodes.

Good Laboratory Practice

The METERLAB system is ideal for demanding applications requiring the determination of pH, conductivity and ions (ISE) in industrial and research laboratories. The varied METERLAB measuring instruments offer GLP-compliant solutions. With the special RED ROD electrode technology, you can be sure of quick response times and long-term accuracy.

HQD – digital electrochemistry for reliable and accurate readings

- Excellent reliability and simple handling via automatic recognition of the electrodes (mix & match)
- High flexibility due to the storage of calibration data in the electrodes



Latest technology: the same input port for all electrodes—the HQD system recognises them automatically

Confidence in your pH, conductivity and O₂ readings

HQD stands for High Quality Digital technology. The HQD meters can be integrated with accessories and electrodes. The special feature of HQD is the newly developed INTELLICAL electrodes: They store all relevant data in digital form in the electrode head. The system benefits from handy practical accessories for use in the laboratory and in the field. HQD measures pH, conductivity and O₂ more reliably and simply than ever before.

Mix + match for simple electrode handling

So clever: INTELLICAL electrodes keep a record of their calibration data. This saves time and makes the process of changing electrodes even smoother. The electrodes are calibrated just once and are ready for immediate use with other HQD meters in the field.

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INTELLICAL electrodes for HQD – digital pH, conductivity and O₂

- Interference-free measurement, also with a 30 m cable, e.g. pH, conductivity
- Calibration free LDO oxygen sensor with minimum maintenance required
- Quick response times and long instrument life of the INTELLICAL electrodes
- Outdoor versions available



Outdoor pH electrode in stainless steel with 5, 10, 15 or 30 m cable



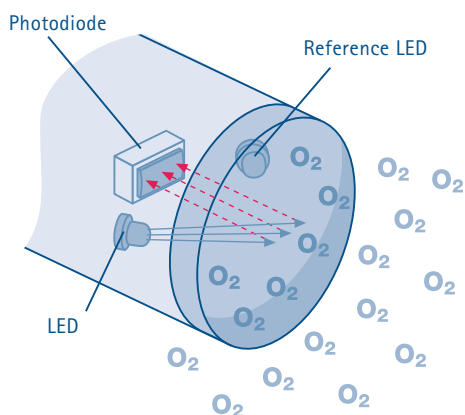
Standard conductivity electrode with 1 or 3 m cable

Versatile: pH and conductivity electrodes

INTELLICAL electrodes benefit from more than 50 years of experience. With a quick response time, excellent calibration stability and long instrument life, the outdoor versions function efficiently even under the most difficult conditions. With digital data transfer, cables can be as long as 30 m, allowing the electrodes to be used in previously inaccessible locations, e.g. wells and bridges.

Ingeniously simple: O₂ measurement without calibration

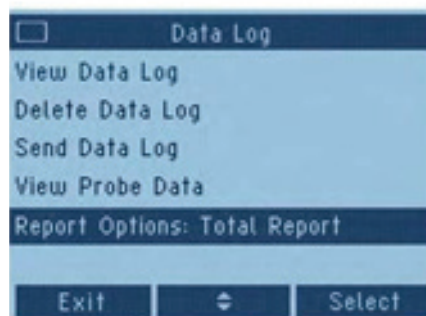
The optical measurement principle of the LDO sensor (luminescent dissolved oxygen) has revolutionised O₂ metering. LDO sensors do not contain a membrane, and are therefore not susceptible to the risk of becoming blocked. Instead of frequent calibrations and changes of electrolyte, the sensor cap has to be replaced just once each year. Using LDO sensors saves time and money from day one, in each and every application.



The LDO sensor is based on an optical method: the more O₂ there is in the sample, the shorter the time it takes for the red light to be emitted



Clear display: visual and sound notification of stable readings



GLP-compliant data management, also in the field: all the settings for each measurement are saved

HQD uses plain English

HQD has an intuitive user interface. The illuminated display is clear and legible. The well organised menu structure is immediately understandable and user friendly. Ensuring smooth, error-free handling for single measurements or for complex tasks.

Need to calibrate? HQD lets you know!

The appropriate calibration interval for the application is defined just once, and HQD faithfully reminds you when the next calibration is due. Furthermore, you can also define the quality individually by entering specifications for the slope.

HQD INTELLICAL electrodes/sensors

All standard INTELLICAL electrodes/sensors are waterproof down to a depth of 3 metres for 24 hours, including temperature sensor. All outdoor INTELLICAL electrodes/sensors are waterproof down to a depth of 30 metres for 24 hours, including temperature sensor, steel housing, with reinforced cable.

ARTICLE	DESCRIPTION	CABLE LENGTH	ART. NO.	CABLE LENGTH	ART. NO.
pH					
	Standard INTELLICAL pH electrode, with liquid electrolyte filling	1 m	PHC301-01	3 m	PHC301-03
	Standard INTELLICAL pH electrode with gel electrolyte filling, maintenance-free	1 m	PHC101-01	3 m	PHC101-03
	Outdoor INTELLICAL pH electrode, rugged, with gel electrolyte filling, maintenance-free	5 m	PHC101-05	10 m	PHC101-10
		15 m	PHC101-15	30 m	PHC101-30
CONDUCTIVITY					
	Standard INTELLICAL conductivity electrode, 4-pole graphite	1 m	CDC401-01	3 m	CDC401-03
	Outdoor INTELLICAL conductivity electrode, rugged, 4-pole graphite	5 m	CDC401-05	10 m	CDC401-10
		15 m	CDC401-15	30 m	CDC401-30
LDO (DISSOLVED OXYGEN)					
	Standard INTELLICAL LDO sensor	1 m	LDO101-01	3 m	LDO101-03
	Outdoor INTELLICAL LDO sensor, rugged	5 m	LDO101-05	10 m	LDO101-10
		15 m	LDO101-15	30 m	LDO101-30



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "HQD", with free downloads of brochures and user manuals



HQD close-up at www.electrochemistry/hach-lange.co.uk, with interactive 3D demonstration, with 14-day free trial!

HQD meters – technical data

FEATURE		METERS			
		HQ11D	HQ14D	HQ30D flexi	HQ40D multi
Measurement channels	Description	1 (pH)	1 (conductivity)	1 (pH or conductivity or O ₂)	2 (per channel, pH or conductivity or O ₂ or ISE)
Oxygen (LDO)	Measuring range: 0.00 – 20.0 mg/l; 0 – 200% Resolution: 0.01 oder 0.1 mg/l; 0.1% saturation Accuracy: ± 1% of the measuring range			Automatic air pressure compensation	Automatic air pressure compensation
pH	Measuring range: 0 – 14 Resolution: (selectable) 0.1/0.01/0.001 Accuracy: ± 0.002 Temperature compensation: automatic	•		•	•
Redox potential	Measuring range: ± 1,500 mV Resolution: 0.1 Accuracy: ± 0.1 mV	•		•	•
Ion concentration (ISE)	Measuring range: electrode-dependent Resolution: (selectable); max. 5 positions 0.1/0.01/0.001 Accuracy: ± 0.1 mV				•
Conductivity	Resolution: max. 5 positions, 2 decimal places Temperature compensation: non-linear (natural water in acc. with DIN 38404/ EN ISO 7888), non-linear (NaCl), linear coefficient [numeric value] %/°C; no compensation		Measuring range: 0.01 µS/cm – 200 mS/cm; Accuracy: ± 0.5% (1 µS/cm – 200 mS/cm)	Measuring range: 0.01 µS/cm – 200 mS/cm; Accuracy: ± 0.5 % (1 µS/cm – 200 mS/cm)	Measuring range: 0.01 µS/cm – 400 mS/cm; Accuracy: ± 0.5% (1 µS/cm – 400 mS/cm)
Calibration	With automatic reminder of calibration and control standard	Max. 4 points	1 point	pH max. 4 points Conductivity 1 point O ₂ 1 point	pH max. 4 points Conductivity 1 point O ₂ 1 point ISE max. 5 points
Autoread		•	•	•	•
Status display		•	•	•	•
Electrode					
Interfaces					Waterproof USB port for printer, PC, temperature, USB memory stick
Password protection		•	•	•	•
Operating options	Basic, detail, total (GLP)				
Data storage	500 measured values; manual or automatic data storage				
IDs	For samples and users: alphanumeric, max. 12 characters; 12 sample and 20 user names; automatic registration of number of samples (0-999)				
Measurement mode	Manual, interval, continuous; measurement methods editable				
Display	Backlit graphic display; 240 x 160 pixel; automatic switch-off in energy saving mode; with date and time display. HQ40D only: simultaneous display of 2 parameters and temperature				
Power supply	Mains power 115 V/250 V (power unit optional) 115 V/250 V; battery powered 4 AA batteries or rechargeable batteries (battery charger necessary)				
Protection rating	IP 67 for meter, outdoor electrodes and connections				
Dimensions, weight	95 x 197 x 36 mm (H x W x D), 323 g (without batteries)				

HQD – order information

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HQD starter kits—you choose the instrument to suit your needs:

H	Q	X	X	D	.	9	9	.	X	X	X	X	X	X
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

METER	
40	HQ40D multi 2-channel meter for pH, conductivity, ISE and O ₂
30	HQ30D flexi 1-channel meter for pH, conductivity and O ₂
14	HQ14D 1-channel meter for conductivity
11	HQ11D 1-channel meter for pH

ELECTRODE/SENSOR	
000	No electrode
101	PHC 101 standard, pH, gel, 1 m
103	PHC 101 standard, pH, gel, 3 m
105	PHC 101 outdoor, pH, 5 m
110	PHC 101 outdoor, pH, 10 m
115	PHC 101 outdoor, pH, 15 m
130	PHC 101 outdoor, pH, 30 m
151	PHC 301 standard, pH, liquid electrolyte, 1 m
153	PHC 301 standard, pH, liquid electrolyte, 3 m
201	CDC 401 standard, conductivity, 1 m
203	CDC 401 standard, conductivity, 3 m
205	CDC 401 outdoor, conductivity, 5 m
210	CDC 401 outdoor, conductivity, 10 m
215	CDC 401 outdoor, conductivity, 15 m
230	CDC 401 outdoor, conductivity, 30 m
301	LDO 101 standard, O ₂ , 1 m
303	LDO 101 standard, O ₂ , 3 m
305	LDO 101 outdoor, O ₂ , 5 m
310	LDO 101 outdoor, O ₂ , 10 m
315	LDO 101 outdoor, O ₂ , 15 m
330	LDO 101 outdoor, O ₂ , 30 m

For example HQ30D.99.101301

The starter kit HQ30D.99.101301 consists of:

- HQ30D meter
- pH gel electrode, 1 m cable
- LDO sensor, 1 m cable

Each kit contains buffer and standard solutions. Each HQ30D and HQ40D kit comes with a case and accessories.

Accessories

ARTICLE	DESCRIPTION	ART. NO.
Outdoor kit	Shockproof plastic cover for outdoor use; with hand strap and neck strap	5828700
Electrode holder	Shockproof holder for the standard electrode, with cable management for up to 3 metres of cable; can be plugged into the plastic cover	5829400
Case (standard)	For standard electrodes; practical plastic case, shockproof, lightweight; contains the outdoor kit, two electrode holders for standard electrodes and 5 sample bottles (120 ml)	5825800
Case (outdoor)	For outdoor electrodes; practical plastic case, shockproof, lightweight; contains the outdoor kit and 5 sample bottles (120 ml)	5835700
Cable marker	For marking when submerged measurements are carried out; 5/pkg	5828610
Electrode clips	Coloured markers for identifying the different electrodes; 5 colours, 2 markers per colour	5819400
USB adapter	For connecting a USB stick, printer, keyboard or PC (only HQ40D)	5813400
USB memory stick	For saving data and transferring data between HQ40D and PC; 128 MB capacity	LZV568
Keyboard	With USB connector	LZV582
LDO sensor cap	Contains one sensor cap, memory chip with calibration data, and sealing rings	5811200
Power unit	For mains powered operation of HQ11D/HQ14D/HQ30D flexi	5826300

→ Buffer and standard solutions for HQD: see page 28



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "HQD", with free downloads of brochure (DOC032.52.00442) and user manuals

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SENSION – outstanding electrochemical measurement technology

- 10 single and multi-parameter meters
- For use in the laboratory and in the field
- Simple, user friendly operation
- Rapid stabilisation of measured values
- Rugged construction



Proven worldwide – for pH, conductivity, O₂ and redox

The SENSION family benefits from the combination of reliable measurement technology and integrated electrodes. SENSION has proven its worth worldwide in numerous applications, especially the analysis of wastewater and drinking water in the laboratory and in the field.

Practical and well designed

All SENSION meters benefit from excellent precision and reliability in combination with intuitive operation. The large display, integrated temperature compensation and useful automatic read and calibration functions ensure efficient analysis.

Also portable in the field

On-site analysis is very demanding, but the five portable SENSION meters consistently satisfy every requirement. Their rugged, watertight construction, together with the ingenious carrying case and the practical electrode holder on the meter, ensure reliable results in the field.

The right SENSION meter – for every parameter and every application

METER		pH	COND.	O ₂ BOD	REDOX	ISE
PORTABLE METERS						
SENSION 1	Basic meter for routine pH analysis	●			●	
SENSION 2	pH meter for research and demanding tasks in the field	●			●	●
SENSION 5	Precision analysis of conductivity, TDS and salinity		●			
SENSION 6	Electrochemical measurement of oxygen in aqueous solutions			●		
SENSION 156	Electrochemical all-rounder for use in the field	●	●	●	●	
LAB. METERS						
SENSION 3	Electrochemical all-rounder for use in the field	●			●	
SENSION 4	pH and ISE configuration for demanding laboratory analysis	●			●	●
SENSION 7	Precision analysis of conductivity, TDS and salinity		●			
SENSION 8	Electrochemical measurement of oxygen in aqueous solutions			●		
SENSION 378	Electrochemical multiple parameter meter for the laboratory	●	●	●	●	

All SENSION meters are available in various configurations for use with different combinations of electrodes and accessories – the right solution for all measurements!



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "SENSION" with free downloads of the brochure (DOC032.52.00599) as well as various data sheets and user manuals



The docking station enables the SENSION meters to be connected to the mains power supply and to transfer data to a printer and a PC

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SENSION meters and electrodes—order information

SENSION METERS	ART. NO.
SENSION 1 with gel-filled pH electrode Portable meter for pH, redox, temperature; inputs: 5-pin and BNC socket; batteries; gel-filled combination pH electrode with temperature sensor, 1 m cable, 1 set of SINGLET buffer solutions (pH 4.01/7.00), case	5170011
SENSION 2 with gel-filled pH electrode Portable meter for pH, redox, ISE, temperature; illuminated display, autoread, data storage, GLP capability; Inputs: 5-pin and BNC socket; for operation with batteries and rechargeable batteries, with gel-filled combination pH electrode with temperature sensor, 1 m cable, 1 set of SINGLET buffer solutions (pH 4.01/7.00), batteries, case	5172512
SENSION 2 with gel-filled pH electrode and docking station Description as 5172512, with docking station for mains powered operation and data documentation	5172515
SENSION 5 with 4-pole conductivity measuring cell Portable meter for conductivity, TDS, salinity, temperature; illuminated display, autoread, data storage, GLP capability, inputs: 5-pin, operation with batteries and rechargeable batteries, with 4-pole graphite conductivity measuring cell, cell constant $K=0.5\text{ cm}^{-1}$, temperature sensor, 1 m cable, calibration solution 1,000 $\mu\text{S/cm}$, batteries, case	5180010
SENSION 5 with 4-pole conductivity measuring cell and docking station Description as 5180010, with docking station for mains powered operation and data documentation	5180014
SENSION 6 with oxygen electrode Portable meter for dissolved oxygen; illuminated display, autoread, data storage, GLP capability, inputs: 5-pin, operation with batteries and rechargeable batteries, with O_2 electrode, 3 m cable, 2 spare membranes, electrolyte, calibration and storage vessel, batteries, case	5185010
SENSION 6 with oxygen electrode and docking station Description as 5185010, with docking station for mains powered operation and data documentation	5185014
SENSION ELECTRODES AND ACCESSORIES	ART. NO.
Gel-filled combination pH electrode with temperature sensor, plastic stem, measuring range pH 0-14, temperature range 0-100 °C, gel electrolyte filling, 5-pin connector, 1 m cable	5193500
Combination pH electrode, refillable , with temperature sensor, plastic stem, measuring range pH 0-14, temperature range 0-100 °C, refillable internal electrolyte, 5-pin connector, 1 m cable	5194000
PLATINUM combination pH electrode with temperature sensor, plastic stem, measuring range pH 0-14, temperature range 0-100 °C, 5-pin connector, gel dispensing function, with 2 replaceable gel-KCl cartridges, 1 m cable	5191000
PLATINUM combination pH electrode with flat membrane for surfaces , with temperature sensor, plastic stem, measuring range pH 0-14, temperature range 0-80 °C, 5-pin connector, gel dispensing function, with 2 replaceable gel-KCl cartridges, 1 m cable	5191500
Gel-filled redox electrode with temperature sensor, plastic stem, temperature range 0-80 °C, 5-pin connector, 1 m cable	5193900
PLATINUM redox electrode with temperature sensor, plastic stem, temperature range 0-80 °C, gel dispensing function, with 2 replaceable gel-KCl cartridges, 5-pin-connector, 1 m cable	5193700
Gel-filled redox electrode, refillable , without temperature sensor, plastic stem, temperature range 0-80 °C, BNC connector, 1 m cable	5193200
Temperature sensor , measuring range 0-80 °C, 5-pin connector	5198000
Oxygen electrode , membrane-covered 2-pole Clark sensor with temperature sensor, measuring range 0-20 mg/l or 0-200%, temperature range 0-50 °C, 5-pin connector, 1 m cable	5197000
Oxygen electrode , description as 5197000, with 3 m cable	5197003
Oxygen electrode , description as 5197000, with 15 m cable	5197015
Conductivity cell , 4-pole, graphite, cell constant $K=0.5\text{ cm}^{-1}$, with temperature sensor, calibration solution 1,000 $\mu\text{S/cm}$, 1 m cable	5197500
Conductivity cell , description as 5197500, with 3 m cable	5197503
Docking station , 230 V voltage supply, for SENSION 2/5/6/156, with RS232C port for data documentation	5187502

→ Buffers for the SENSION family: see page 28

→ Other SENSION meters, electrodes and accessories on request

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METERLAB – electrochemistry for Good Laboratory Practice (GLP)

METERLAB products provide excellent laboratory analysis of pH, conductivity and ions (ISE). Meters, electrodes and accessories complement the METERLAB products. METERLAB gives reliable results through it's simple operation. With METERLAB, GLP comes as standard.



PHM 220—the universal laboratory pH meter



ION 450—latest technology for ion analysis



Comprehensive choice of electrodes with RED ROD technology for quick response times and high precision

METERLAB instruments—the key technical data

DESCRIPTION	CDM 210	CDM 230	PHM 210	PHM 220	PHM 240 *	PHM 250 *	ION 450 *
Parameter	Conductivity	Conductivity	pH	pH	pH, ISE	pH, ISE	PH, conductivity, ISE
Measuring range	0.01 µS/cm to 400 mS/cm	0.001 to 2,000 µS/cm	-9.00 to +23.00 pH	-9.00 to +23.00 pH	-9.000 to +23.000 pH	-9.000 to +23.000 pH	-9.000 to +23.000 pH
Temperature compensation	Linear	Linear Non-linear					
Calibration points		1	2	3	9	9	5
GLP							
Date/time		●		●	●	●	●
Measured values storage		●		●	●	●	●
Calibration reminder		●		●	●	●	●
Sample changer can be connected		●		●	●	●	●
Special features	Autoread	Wide measuring range	Simple operation	GLP	Multipoint calibration, operation with sampler		Versatile

* Free input of calibration standards
All: RS232C interface, autoread, AutoCal

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



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "METERLAB" with free downloads of brochures and user manuals

Selection of METERLAB pH, redox and fluoride electrodes



PARAMETER	pH	pH	pH	pH	pH	REDOX	F ⁻
Applications	General purpose	General purpose	Alkaline samples	High KCl outflow	General purpose gel-filled	General purpose	
Type	PHC2001	PHC2085	PHC2011	PHC2701	PHC3105	MC3051Pt	ISEC301F
Art. no.	E16M313	E16M501	E16M317	E16M323	E16M308	E31m003	E41M017
Reference system	RED ROD	RED ROD	RED ROD	RED ROD	Ag/Cl	Ag/Cl	Ag/Cl recommended
Measuring range	0-12 pH	0-12 pH	0-14 pH	0-12 pH	2-12 pH		5x10 ⁻⁷ -10 ⁻⁹ M 0.01-20,000 ppm
Temperature range	-10 to 100 °C	-10 to 100 °C	0 to 100 °C	-10 to 100 °C	0 to 60 °C	0 to 80°C	0 to 50°C
Min. Sample depth	18 mm	14 mm	18 mm	18 mm	18 mm		
Liquid junction	Porous pin	Porous pin	Porous pin	Ring-shaped	Open	Porous pin	
Special features		Temperature sensor			Rugged	Platinum ring sensor element Salt bridge solution 3 M KCl + saturated AgCl	Interference ions OH ⁻ pH range 5-7

- Buffers for the METERLAB family: see next page
- More about METERLAB meters, electrodes and accessories on request

Selection of METERLAB conductivity electrodes



PARAMETER	CONDUCTIVITY	CONDUCTIVITY	CONDUCTIVITY	CONDUCTIVITY	CONDUCTIVITY
Applications	General purpose	General purpose	Pure water	Strong acids/bases	Low conductivity
Type	CDC566T	CDC641T	CDC511T	CDC861T	CDC267-9
Art. no.	E61M010	B15B001	E61M009	E16M016	E61M011
Cell constant	1.0 cm ⁻¹	0.85 cm ⁻¹	1.0 cm ⁻¹	1.0 cm ⁻¹	0.1 cm ⁻¹
Number of poles	4	2	4	4	2
Maximum temperature	80 °C	100 °C	80 °C	100 °C	100 °C
Minimum immersion depth	35 mm	14 mm	3 mm	35 mm	26 mm
Special features	Temperature sensor	Temperature sensor platinised	Temperature sensor	Temperature sensor platinised	



The SAM7 sample station is a combined magnetic stirrer and electrode holder—for stable and reproducible stirring conditions

pH buffer and conductivity standards for HQD, SENSION, METERLAB

pH buffer solutions

DESCRIPTION	DESCRIPTION	QUANTITY	ART. NO.
Certified pH standards that conform to IUPAC Supplied in airtight sealed tin; guaranteed shelf life; with COFRAC certificate; traceable to standard reference material produced by NIST, tolerance ± 0.010 pH (25 °C)			
pH 1.679		500 ml	S11M001
pH 4.005		500 ml	S11M002
pH 7.000		500 ml	S11M004
pH 10.012		500 ml	S11M007
Quality buffer solutions Ready to use; with and without colour coding*			
pH 4.01	Red	500 ml	2283449
pH 7.00	Yellow	500 ml	2283549
pH 10.01	Blue	500 ml	2283649
pH 4.01	Colourless	500 ml	1222349
pH 7.00	Colourless	500 ml	1222249
pH 10.00	Colourless	500 ml	1222149
pH 1.09	Technical, conforms to (DIN 19267)	500 ml	S11M009
pH 4.65	Technical, conforms to (DIN 19267)	500 ml	S11M010
pH 9.23	Technical, conforms to (DIN 19267)	500 ml	S11M011
Buffer/Powder Pillow Individually sealed, each sufficient for 50 ml fresh solution; with colour coding*			
pH 4.01	Red	50/pcs	2226966
		250/pcs	2226964
pH 7.00	Yellow	50/pcs	2227066
		250/pcs	2227064
pH 10.00	Blue	50/pcs	2227166
		250/pcs	2227164
SINGLET buffer solutions In individual pouches, hermetically sealed; with colour coding; 25 ml each*			
pH 7.00 and pH 10.01	Yellow + Blue	2 x 10/pcs	2769820
pH 4.01 and pH 7.00	Red + Yellow	2 x 10/pcs	2769920
pH 4.01	Red	20/pcs	2770020
pH 7.00	Yellow	20/pcs	2770120
pH 10.01	Blue	20/pcs	2770220

→ Additional buffers and standards on request

Conductivity standard solutions

DESCRIPTION	DESCRIPTION	QUANTITY	ART. NO.
Standards with certificate Supplied in airtight sealed tin; guaranteed shelf life; with certificate; traceable to standard reference material produced by NIST			
KCl 1 D	111.3 mS/cm $\pm 0.5\%$	500 ml	S51M001
KCl 0.1 D	12.85 mS/cm $\pm 0.35\%$	500 ml	S51M002
KCl 0.01 D	1,408 μ S/cm $\pm 0.5\%$	500 ml	S51M003
NaCl 0.05%	1,015 μ S/cm $\pm 0.5\%$	500 ml	S51M004
NaCl solutions			
85.47 mg/l as NaCl	180 ± 10 μ S/cm	100 ml	2307542
491 mg/l as NaCl	1,000 ± 10 μ S/cm	100 ml	1440042
1000 mg/l as NaCl	1,990 ± 20 μ S/cm	100 ml	210542
10,246 mg/l as NaCl	18,000 ± 50 μ S/cm	100 ml	2307442
Molar KCl solutions			
KS 910	12.88 mS/cm	500 ml	C20C250
KCl 0.1 M			
KS 920	1.413 mS/cm	500 ml	C20C270
KCl 0.01 M			
KS 930	146.9 μ S/cm	500 ml	C20C280
KCl 0.001 M			
Other			
Electrode rinse solution		20/pcs	2770320
Electrode rinse solution		500 ml	2756549

*Buffer traceable to standard reference material produced by NIST;
tolerance ± 0.02 pH (25 °C)



Outstanding photometers for water analysis and quality control

The HACH LANGE range of photometers are as varied as the situations in which water analysis and quality control are required. HACH LANGE has the right instrument with the right performance spectrum for every application. All the photometers are preprogrammed for ready-to-use HACH LANGE reagents.

POCKET colorimeters



DR 800 colorimeters



DR 2800



XION



DR 5000



The Who's Who of HACH LANGE photometers

FUNCTIONS	POCKET COLORI-METERS p. 30	DR 800 COLORI-METERS p. 32	DR 2800 p. 34	XION p. 37	DR 5000 p. 35
See page					
Wavelength range: visible light (VIS) and UV light	VIS	VIS	VIS	VIS	UV-VIS
Optical system: photometer type	Filter	Filter	Spectral	Spectral	Spectral
Scan				Wavelength/Time	Wavelength/Time
Pre-programmed tests	1-2	Max. 90	~ 220	~ 100	~ 230
Cuvette tests, automatically reliable			●	●	●
PERMACHEM Powder Pillows, ACCUVAC, reagent solutions	●	●	●		●
User methods programmable			●	●	●
Measured value storage capacity	Max. 10	Max. 50	Max. 500	Max. 1,000	Max. 1,000
GLP compliant documentation			●	●	●
Sector-specific supplementary software					●
Cuvette carousel					●
Flow-through function (Sipper)					●
Display with touchscreen			●		●
Ports		RS232	USB	RS232	USB
Protection rating	IP 67	IP 67	IP 42	IP 31	IP 31
Mains-independent operation	●	●	●		
Available in portable laboratory	●	●	●		
Dimensions (W x H x D)	6.1 x 3.2 x 15.2 cm	8.7 x 4.7 x 23.6 cm	22 x 13.7 x 33.2 cm	41.5 x 16.5 x 37 cm	45 x 20 x 50 cm
Weight	230 g (without batteries)	450 g (without batteries)	4 kg (without batteries)	9 kg	15.5 kg

- Thermostats, printers and other accessories for the photometers: see page 78
- Reagents and quality assurance for the photometers: see page 66
- Laboratory photometers for analysis in chapter 4, laboratory automation: see page 83

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POCKET Colorimeter II—30 mini-meters for field testing

- More than 30 flexible, single parameter instruments
- Easy operation
- Small enough for almost any pocket
- Reliable results without a mains connection
- Rugged construction yet lightweight



Pocket sized and rugged colorimeters, complete with carrying case



Now better than ever for field-testing

Each POCKET Colorimeter II is programmed for one or two parameters. It is pocket sized and together with the practical HACH tests, gives reliable results anywhere, even under the most difficult conditions. The tried and tested colorimeters have been enhanced to make them even more convenient to use, and now offers an ideal combination of robust technology and intuitive handling.

Benefits

- Simple: all functions are available via only four keys
- Power: battery operation for a maximum of 2,000 tests
- Clear readings: even under difficult conditions, thanks to lighting and large figures on the display
- Waterproof to IP 67: for watertight results!

Strength of in the design

With their rugged construction, these lightweights (230 g) can cope with all situations. All models are supplied in a fully equipped carrying case.



Mini-meters for field testing

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POCKET Colorimeter II in carrying case, complete with reagents, cuvettes and operating instructions

METER PARAMETER	MEASURING RANGE/mg/l	METHOD	DETERMINATIONS	ART. NO.
Aluminium	0.01 – 0.80	Aluminon	100	5870025
Ammonium	0.01 – 0.8	Salicylate	100	5870040
Bromine	0.005 – 0.15	DPD	20	5870021
Brom	0.05 – 4.5/0.2 – 10.0	DPD	100/50	5870001
Chlorine (free and total and pH)	0.10 – 10 (Cl ₂)/6.0 – 8.5 (pH)	DPD/phenol red	100/100 and 100 (pH)	5870012
Chlorine (free and total)	0.02 – 2.0/0.10 – 8.0	DPD	50/50	5870000
Chlorine dioxide	0.05 – 5.0	DPD, glycine	100	5870051
Chromium (VI)	0.01 – 0.7	Diphenylcarbazide	100	5870017
Copper	0.04 – 5.0	Bicinchoninate	100	5870019
Fluoride	0.1 – 2.0	SPADNS reagent	50	5870005
Iron	0.01 – 1.7	TPTZ	50	5870016
Iron	0.02 – 5.0	FerroVer	100	5870022
Lead	0.005 – 0.15	Column extraction	20	5870021
Manganese	0.01 – 0.7	PAN	100	5870018
Manganese	0.2 – 20	Periodate oxidation	100	5870015
Molybdate	0.02 – 3.0/0.1 – 12.0	Ternary complex	100	5870010
Monochloramine/ ammonium-free	0.04 – 4.5 (Cl ₂)/0.02–0.5 mg/l	Indophenol	100/50	5870026
Nickel and cobalt	0.01 – 1.0 (Ni)/0.02 – 2.0 (Co)	PAN	100	5870020
Nitrate (NO ₃ ⁻)	0.4 – 30	Cd reduction	100	5870002
Oxygen	0.2 – 10.0	HRDO	50	5870003
Ozone	0.01 – 0.25/0.01 – 0.75	Indigo trisulphonate	50	5870004
Phosphate (ortho/total) (PO ₄ ³⁻)	0.02 – 3.0	PhosVer3	100	5870006
Phosphonate with UV lamp	0.2 – 2.5/1.0 – 125 (PO ₄ ³⁻)	PhosVer3/UV	100	5870008
Silica	1.0 – 100	Molybdate	100	5870034
Sulphate	2.0 – 70	Barium chloride	100	5870029
Zinc	0.02 – 3.0	Zincon	100	5870009
Wavelength 420 nm	0 – 2.5 Absorbance			5870042
Wavelength 450 nm	0 – 2.5 Absorbance	Also for immunoassays		5870045
Wavelength 476 nm	0 – 2.5 Absorbance			5870047
Wavelength 500 nm	0 – 2.5 Absorbance			5870050
Wavelength 528 nm	0 – 2.5 Absorbance			5870052
Wavelength 550 nm	0 – 2.5 Absorbance			5870055
Wavelength 580 nm	0 – 2.5 Absorbance			5870058
Wavelength 600 nm	0 – 2.5 Absorbance			5870060
Wavelength 655 nm	0 – 2.5 Absorbance			5870065

→ All tests for POCKET Colorimeter II: see page 54



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "POCKET" together with the desired parameter from the above list, with free downloads of brochure (DOC062.52.00608) and User Manual (DOC022.52.006)

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DR 800 series – compact colorimeters for 20, 50 or 90 tests

The DR 800 colorimeters are designed for use in the field. They provide simple handling, using the latest technology with a rugged construction. The three models are configured for approximately 20, 50 or 90 water analysis tests, you choose the right instrument for your analysis.

Versatile

The DR 800 models are pre-programmed for different numbers of tests:

- DR 820: 20 tests
- DR 850: 50 tests
- DR 890: 90 tests

All three DR 800s work best in combination with the practical HACH tests for reliable, fast results in wastewater, drinking water and process water analysis.

Reliable

Suitable for use, anywhere! The dust-proof and waterproof (IP 67) construction of the DR 800 models guarantees reliable water analysis even under the most difficult conditions. The large graphic display shows the results and the data storage and data transfer features enable the results to be easily documented.

Key benefits

Advantages of the DR 800 are:

- Automatic wavelength selection for simple operation
- Capable of operating for long periods without being connected to the mains
- User methods can be programmed
- Configured for immediate use



DR 800 also available with soft sided case



DR 800 with portable water laboratory: see page 38

Technical data for DR 800 series

Model	DR 820	DR 850	DR 890
Art. no.	4844000	4845000	4847000
Display	Large graphic display		
Optical system	Very stable, energy-saving LED technology		
Wavelength range	520 nm	520 nm 610 nm	420 nm 520 nm 560 nm 610 nm
Spectral band width	10 nm	10 nm	10 nm
Wavelength selection	Automatic when method is selected		
Measurement methods	Pre-programmed HACH methods Absorbance and transmittance User methods can be programmed		
Date/time	Built-in real-time clock		
Data storage	For up to 99 measured values		
Interface	RS232C via infrared adapter		
Dimensions	23.6 cm x 8.7 cm x 4.7 cm		
Weight	450 g (without batteries)		
Protection class	IP 67, dustproof and waterproof		
Test marks	CE, GS		

DR 800 accessories

DESCRIPTION	ART. NO.
Measurement cuvettes (10/20/25 ml graduations; 1 inch diameter), 6/pkg	2401906
Soft sided carrying case for DR 800 models	2722000
Rugged carrying case for DR 800 models	4942500
Rugged carrying case for DR 800 laboratories for colorimeter, accessories and reagents	4943000
Immunoassay adapter, 12 mm diameter	4846700
Data transfer adapter (IR/RS232C) including cable	4849000
HACH LINK software for data transfer from HACH photometers to a PC through an interface	4966500

→ DR 800 in portable water laboratory: see page 38

→ All tests for DR 800: see page 54



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "DR 800", with free download of Short User Manual (BDA437)

DR 800 parameter list

PARAMETER	DR 820	DR 850	DR 890
Aluminium	●	●	●
Ammonium		●	●
Boron			●
Bromine	●	●	●
Chloramine (mono)		●	●
Chlorine (free and total)	●	●	●
Chlorine dioxide	●	●	●
Chromium (VI and total)			●
COD		●	
Colour (Pt-Co units)			●
Copper			●
Cyanide		●	●
Cyanuric acid	●	●	●
DEHA			●
Detergents (anionic)		●	
Fluoride		●	●
Hardness	●	●	●
Hydrazine			●
Immunoassay			●
Iron	●	●	●
Manganese	●	●	●
Molybdat		●	●
Nickel	●	●	●
Nitrate	●	●	●
Nitrite	●	●	●
Nitrogen (Kjeldahl)			●
Nitrogen (total) (TN _t)			●
Organic acids	●	●	●
Oxygen		●	●
Ozone		●	●
pH (photometric)	●	●	●
Phosphate (ortho)	●	●	●
Phosphate (total)		●	●
Phosphonate		●	●
Silicic acid/Silicate		●	●
Sulphate	●	●	●
Sulphide		●	●
Suspended solids (TSS)		●	●
Tannin + lignin		●	●
TOC		●	●
Turbidity (FAU)	●	●	●
Zinc		●	●

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Outstanding variety of methods—for all HACH LANGE tests

The unique HACH LANGE range of reagents can now be used with the DR 2800 spectrophotometer. All PERMACHEMs, ACCUVACs and cuvette tests are preprogrammed and freely selectable. In addition, the DR 5000 UV-VIS spectrophotometer now covers an even more extensive range of applications, including programmed user methods in the UV range, scans, special drinking water and brewery analysis.

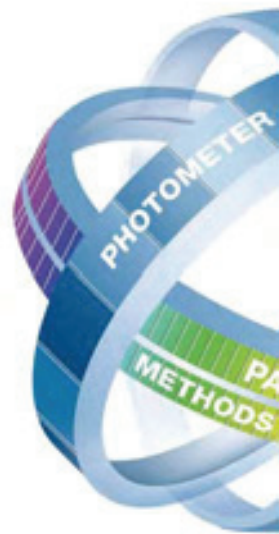
For all HACH LANGE tests: DR 2800 VIS Spectrophotometer—measurements without even pressing a button

Simple and very precise: automatic test identification and outlier elimination

Time-saving and innovative: evaluation in the open cell compartment

Intuitive operation: touchscreen with easily understandable menus

NEW!



Wastewater

CUVETTE TEST

Results automatically saved



50 mm cells

ACCUVAC

1-inch cells

Easy-to-handle innovative and reliable cuvette tests, comparable to reference methods

USB memory stick

PERMACHEM Powder Pillows

Even more versatile: DR 5000 UV-VIS Spectrophotometer, e.g. for scans and all HACH LANGE tests; freely programmable

NEW!

0.954

DR 5000

DR 5000

cm inch

Multi cell holder

Automatic sipper module

Results saved manually

Drinking water, cooling water, boiler water

ACCUVAC PERMACHEM

DR 2800 VIS: rugged instrument for use in the laboratory and in the field

The DR 2800's reliable optical system ensures accurate results. Each wavelength is freely selectable, and the instrument's memory can accommodate 50 user methods and up to 500 measured values alongside the 200 preprogrammed tests. The variable cell sizes enable readings to be taken across wide measuring ranges, from trace analysis to high concentrations in electroplating baths. Easily understandable menus and the large touchscreen helps prevent errors.

DR 5000 UV-VIS: demanding water analysis in the laboratory

The DR 5000 UV-VIS Spectrophotometer culminates from the experience of the manufacturers HACH and LANGE: high quality optics, fast scans and user friendly operation are essential in any demanding water laboratory. The key benefits include the versatility of the DR 5000. This is reflected in the multi cell holder, the cell modules, the high precision optics and more than 200 factory-installed HACH LANGE methods.

→ For more information about the tests for the DR 2800 and DR 5000 see page 54

→ Technical data: see next page



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "DR 2800" or "DR 5000", with free downloads of brochures (DR 2800: DOC032.52.00437; DR 5000: DOC032.52.00432) and User Manuals (DR 2800: DOC022.52.00720; DR 5000: DOC022.52.00654)

Facts and figures about the DR 2800 and DR 5000



DR 5000 UV-VIS Spectrophotometer with high precision optics



Application software for drinking water analysis: LZV571



Application software for brewery analysis conforms with MEBAK, LZV570

Technical data

NEW!

NEW!

	DR 2800 VIS Spectrophotometer	DR 5000 UV-VIS Spectrophotometer with multi cell holder
Article number	LPV422.99.00001	LPV408.99.00001
Reference beam technology	To compensate for lamp ageing and power fluctuations	
Operating modes	Absorbance ($\pm 3A$), transmittance (%), concentration	
Wavelength range	340–900 nm	190–1,100 nm
Wavelength accuracy	± 1.5 nm	± 1 nm at 200–900 nm
Wavelength reproducibility	0.1 nm	0.1 nm
Wavelength resolution	1 nm	0.1 nm
Scan rate	-	900 nm/min in 1 nm steps
Spectral band width	5 nm	2 nm
Photometric accuracy	5 mA at 0.0–0.5 A; 1% at 0.5–2.0 A	
Photometric linearity	< 0.5% at 2 A; 1% at > 2 A	
Stray light	< 0.1% absorbance at 340 nm	< 0.05% absorbance at 340 nm
IBR Integrated Barcode Reader	Automatic identification of LANGE Cuvette Tests, including 10 measurements per rotation for outlier elimination	
Cell holders	Round cuvettes: 1 inch, 13 mm Rectangular cells: 10 mm, 50 mm, 1 inch	Multi cell holder for round Round cuvettes: 30 mm, 1 inch Rectangular cells: 10 mm, 20 mm, 50 mm, 1 inch
Flow-through measurement	Manual flow-through module, without sipper motor (Art. no. 5940400)	Automatic sipper module for flow-through cells (Art. no. LZV485)
Changer	-	Changer module for a maximum of seven rectangular cells, 10 mm (Art. no. A23620)
Cell temperature control	-	Peltier module 15–50 °C, for rectangular cells, 10 mm (Art. no. LZV513)
Display	Backlit, high-resolution LCD (320 x 240 pixel, touchscreen)	
Data storage	500 measured values	1,000 measured values, 20 wavelength scans, 20 time scans
Ports	1 USB port for PC, 1 USB port for printer, keyboard, USB memory stick	1 USB port for PC, 2 USB ports for printer, keyboard, USB memory stick
Protection rating	IP 42	IP 31
Power requirement	100–120 V; 200–240 V; 50/60 Hz; automatic switchover	
Li ion battery	Optional (Art. no. LZV551)	-
Dimensions (H x D x W), weight	13 x 33 x 22 cm, 4.1/4.4 kg without/with battery	20 x 50 x 45 cm; 15.5 kg



For information about additional software, cells, peripherals and other accessories for the DR 2800 and DR 5000 see page 78; complete accessories list in eShop under www.hach-lange.co.uk, www.hach-lange.com, keyword "LPV408" for DR 5000 or "LPV422" for DR 2800

For accurate analysis: XION spectrophotometer

- **Manages and exports data**
- **Variable wavelength scans**
- **Time dependent measurements with auto function**
- **100 LANGE tests available**
- **Same as LICO 400 for measuring the colour of clear liquids**



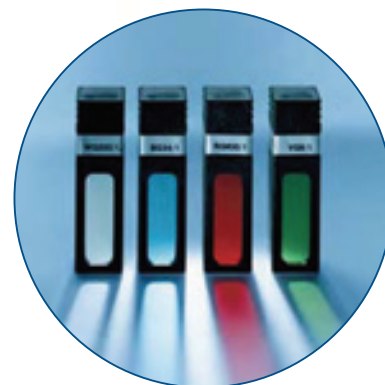
Benefit: working with open cuvette compartment—with XION LOCK IN technology

XION—Data management for water analysis

The database enables the data from 2,500 measurements to be stored and evaluated without a PC. The data can be exported through the serial interface to a PC or LIMS, or can be copied. Thanks to the data handset, the instrument data can be updated at any time by telephone. Automatic outlier elimination ensures maximum reliability in the results of LANGE cuvette tests.

LICO 400—Standard colour determination

With 24 international colour scales, e.g. Hazen (Pt-Co), Gardner, Saybolt and ASTM D 1500, the LICO 400 is the ideal colorimeter. It is suitable for measuring coloured transparent solutions. It also conforms to Pharm. Eur. and US-Pharm. All colour scales are easily readable with one measurement in just one cuvette.



LZV537 test filter kit. Secondary standards for ISO-compliant self-monitoring:
→ See page 80

XION spectrophotometer/LICO 400 colorimeter

Model no.	LPV385 (XION), LMV184 (LICO 400)
Type	Spectrophotometer with reference beam path
Wavelength range	340–900 nm
Wavelength accuracy	± 2 nm
Operating modes	Concentration, absorbance, transmittance
Scan	Wavelength scan, time scan
Zeroing	Automatic
Cuvette compartments	Separate, for LANGE round or rectangular cuvettes up to 10 x 50 mm
Storage	For more than 2,500 measured values; for user methods

LOCK IN technology	To eliminate stray light
Large display	For measured values, graphs and tables
IBR technology*	With tenfold measurement of round cuvettes, including outlier elimination
LANGE cuvette tests*	Completely pre-programmed
LANGE NET*	Integrated data handset for updating data by telephone
Interfaces	1 serial and 1 parallel

* XION spectrophotometer only

→ LANGE tests for XION: see page 54–65,
Accessories: see page 77–82



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword „XION“ or „LICO 400“, with free downloads of brochures (XION: DOC032.52.00007; LICO: DOC032.52.00534) and User Manuals (XION: BDA 447, LICO: DOC022.52.00524)

DREL and CEL portable field laboratories

- Configured for a variety of applications
- Choice of parameters
- Versatile and rugged
- Simple operation with ready-to-use reagents

Compact and comprehensive laboratories

Today, we have to be able to carry out analysis anywhere. The portable laboratories contain everything needed to ensure that accurate measurements can be taken. Even in the field, there is the need for efficient measurement technology, practical accessories and ready-to-use reagents. The integrated work surface enables analysis to be carried out safely and easily at any location.



The ultimate in versatility—the DREL 2800 analysis case with tests for more than 20 parameters for professional water analysis.

Photometers, digital titrators and electrochemical methods

DREL and CEL comprehensive laboratories can deal with all kinds of water:

- Drinking water
- Wastewater
- Cooling and boiler water
- Process water, and many more

Anyone can use the instruments without any difficulty.



The colorimeters of the DR 800 family are included in the CEL analysis case. They are configured for different ranges of parameters.



For more information about the portable complete laboratories, also in other configurations, go to www.hach-lange.co.uk, www.hach-lange.com, keyword "DREL" or "CEL"

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CEL and DREL complete laboratories—a selection

	CEL 890 COMPLETE LABORATORY For cooling and boiler water				DREL 2800 COMPLETE LABORATORY For professional water analysis			
Art. no.	2688400				On request			
Contents	Complete with DR 890 colorimeter, SENSION 1 pH meter, SENSION 5 conductivity meter, digital titrator, BARTs, reagents (see list below), accessories, manuals, in two sturdy cases				Complete with DR 2800 spectrophotometer, optional pH meter, conductivity probe, oxygen probe with electrodes, optional turbidimeter, digital titrator, reagents (see list below), accessories, manuals, in two sturdy cases			
PARAMETER	MEASURING RANGE	METHOD*	DETERMINATIONS	ART. NO.	MEASURING RANGE	METHOD*	DETERMINATIONS	ART. NO.
Acidity					10-4,000 mg/l	D	100	2272800
Alkalinity	10-4,000 mg/l	D	100	2271900	10-4,000 mg/l	D	100	2271900
Ammonium (as N)	-				0.01-0.50 mg/l	P	100	2668000
Bacteria	BART tests**	B	3 each	2434809				
Bromine	0.04-4.50 mg/l	P	100	2105669	0.05-4.50 mg/l	P	100	See Chlorine
Calcium	-				100-4,000 mg/l	D	100	2447500
Calcium	-				10-160 mg/l	D	100	2447200
Chloride	10-8,000 mg/l	D	100	2288000	10-10,000 mg/l	D	100	2288000
Chlorine, free	0.03-5.0 mg/l	P	100	1407099	0.02-2.00 mg/l	P	100	2105569
	0.02-2.0 mg/l	P	100	2105569				
Chlorine, total	0.03-5.0 mg/l	P	100	1406499	0.02-2.00 mg/l	P	100	2105669
	0.02-2.0 mg/l	P	100	2105669				
Chromium (VI)	-				0.01-0.70 mg/l	P	100	1271099
Colour	1-500 Pt-Co units	P		Reagent-free	1-500 Pt-Co units	P		Reagent-free
Conductivity	0.0001-199.9 mS/cm	E		Reagent-free		E		Reagent-free
Copper	6-210 µg/l	P	100	2603300	0.04-5.00 mg/l	P	100	2105869
Hardness, total	10-160 mg/l	D	100	2448100	0.6-220 °dH	D	100	2272000
	100-4,000 mg/l		100	2448000	10-4,000 mg/l			
Iodine	-				0.07-7.00 mg/l	P	100	See Chlorine
Iron, total	0.03-3.0 mg/l	P	100	2105769	0.02-3.00 mg/l	P	100	2105769
Manganese	0.2-20.00 mg/l	P	100	2430000	0.1-20.00 mg/l	P	100	2430000
Molybdate	0.2-40 mg/l	P	100	2604100				
Nitrate (as N)	-				0.30-30.00 mg/l	P	100	2106169
Nitrite	2-150 mg/l	P	100	2107569	0.002-0.300 mg/l	P	100	2107169
Oxygen, dissolved	0.002-1 mg/l	P	25	2501025				
pH	0-14 pH	E		Reagent-free	4-9	E	50	Reagent-free
Phosphonates	0-125 mg/l	P	100	2429700				
Phosphorus, ortho	0.14-30mg/l	P	100	2244100	0.02-2.50 mg/l	P	100	2106069
Phosphorus, total					0.02-2.50 mg/l	P	100	2459000
Sequestrants	0-40 mg/l Na ₄ EDTA	D	100	1457799 2434501 2284799 244932				
Silica	0.02-1.60 mg/l	P	100	2459300				
Silica	3-200 mg/l	P	100	2244300	1-100 mg/l	P	100	2429600
Sulphate	-				2.0-70 mg/l	P	100	2106769
Sulphide					5.0-800 µg/l	P	100	2244500
Sulphite	4.0-400 mg/l	D	100	2272300				
Suspended solids	5-750 mg/l	P		Reagent-free	5.0-750 mg/l	P		Reagent-free
Zinc	0.02-3.0 mg/l	P	100	2429300				

* Method: P = Photometric; D = Titrimetric with digital titrator; E = Electrochemical, B = Biological

** BART tests: Per test, three determinations of iron bacteria, sulphate-reducing and slime-forming bacteria

→ For more information about the tests for the DR 2800 and DR 5000 see pp 34-36

→ For more information about the DR 800 colorimeters and the DR 2800 photometer see pages 32 and 34

→ More reagents for the DR 800 and DR 2800: see pp 46-65

Portable microbiological testing anywhere

- Comprehensive MEL portable laboratories
- Wide range of parameters
- Prepared tests
- Simple to use
- Accurate results



The microbiological laboratory with carrying case

A variety of microbiological parameters can be measured in the field. The fully equipped portable laboratory contains an incubator, which can run on mains or battery power.

Yes/No answers or exact bacterial counts

Both can be provided by the MEL laboratory. From sterile working practices to the final measured value. This can all be achieved under difficult conditions. These systems are suitable for all types of water.

MEL microbiology environmental laboratories

DESCRIPTION/ ART. NO.	FOR THE DETERMINATION OF	TYPE OF DETERMINATION	REAGENT KITS	KIT ART. NO.
MEL MF 2569700	<i>E. coli</i> , total coliforms optional: faecal coliforms, pseudomonas, total bacterial count	Membrane filtration	MF reagent kit A, with 200 ready-mounted funnels with Membrane filters and petri dishes for filtration station II 200 m-Colibblue24 broth, 200 sampling bags	2619101
MEL PA/ 2569600	<i>E. coli</i> , total coliforms, additional: chlorine, nitrate, total dissolved solids, pH	Presence/ Absence (yes/no)	MEL P/A nutrient media kit, with 50 disposable P/A tests Nutrient broth with MUG, 50 sampling bags Chlorine reagent kit, free and total chlorine Nitrate reagent kit	2580000 2438800 1403599
MEL MPN/ 2569800	<i>E. coli</i> , total coliforms optional: faecal coliforms, total bacterial count	Most Probable Number	MPN reagent kit, nutrient media salt for 25 5-tube MPN tests, with 135 tubes LT/MUG nutrient solution, 30 tubes brilliant green bile broth, 30 sterile inoculating loops, 25 sterile 11-ml pipettes, 25 sampling bags	2580200
MEL 850/ 2688800	<i>E. coli</i> , total coliforms Ammonium, chlorine, free and total, colour, total dissolved solids, nitrate, nitrite, o-phosphate, sulphide, pH, temperature, turbidity	Presence/ Absence (yes/no)	MEL 850 reagent kit Chlorine reagent kit, free and total chlorine	2691100 2438800

→ Microbiological tests: see page 70; accessories on request

The unique HACH LANGE spectrum of photometric and visual tests

The HACH LANGE range of products for visual and photometric water analysis is unique: with tests for more than 70 parameters in all relevant measuring ranges, from simple screening to reliable monitoring of threshold values—and always easy to use! In combination with a HACH LANGE photometer or visual evaluation kit, the tests allow analysis for each and every photometric application.

Visually evaluated tests—portable, fast and affordable

For fast results in the field, HACH LANGE offers simple, proven tests, e.g.

- Test strips
- Colour cubes and disks
- Drop count tests
- Digital titrator

Affordable analysis for semi-quantitative results, without complex instruments.

Simple photometry—Powder Pillows and ACCUVAC

Ideal for photometric measurements under difficult conditions:

- Powder Pillows are individually packaged reagents with a shelf life of several years
- ACCUVACs: vacuum-sealed glass ampules containing measured amounts of reagents. They guarantee simple handling, with no manual dispensing

Outstanding precision and handling—cuvette tests

Cuvette analysis can satisfy the most demanding tasks, e.g. monitoring consent limits as an equivalent alternative to time-consuming reference methods. Their quality is demonstrated by the fact that for the first time a cuvette test—ISO COD—has been accepted as a reference method.



Visual tests, e.g. colour disks

Simple photometry, e.g. Powder Pillows, ACCUVAC

Cuvette test, e.g. Ammonium

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Simple to use – visual tests, Powder Pillows and ACCUVAC

Photometric analysis of drinking water and wastewater can also be carried out under the most difficult conditions using Powder Pillows and ACCUVACs. They contain an exactly portioned amount of reagent, have a long shelf life, and give reliable measurement results at an attractive price. Both test variants are available for a large number of parameters and can be evaluated visually or with HACH LANGE photometers.

Colour disks and cubes

Colour comparison tests enable analysis to be carried out economically, e.g. on-site process and water checks. Simply add a Powder Pillow or ACCUVAC to the sample, compare the resulting colour with the colour disk, and read off the concentration at the point where the colour match is found. Since the colour scale is continuous, the colour disk is more accurate than the colour cube.

For order information see
→ [List of reagents on page 47](#)



Test strips

Simple to handle test strips give an overview of the water quality in just a few seconds. In the laboratory, test strips provide a quick indication of the measuring range or any problems. In the field they are ideal for monitoring swimming baths or surface water.

For order information see
→ [List of reagents on page 47](#)





Drop count tests + digital titrator

Drop count tests are simple titrations: the reagent is dripped into the sample until a colour change occurs. On the basis of the drop count, the result is read from a table. The digital titrator displays the result directly for many parameters. It uses parameter specific reagent cartridges, which contain sufficient reagent for a large number of analyses and are simple to replace.

For order information see
 → List of reagents on page 47
 → Digital titrator, page 52-53, 77



Powder Pillows—more than 100 low-price methods

Powder Pillows are available for a large number of parameters and measuring ranges—there are more than 100 tests in all. Hermetically sealed in aluminium foil pillows, the reagents have a shelf life of many years. The reagent is simply poured into the measuring cuvette together with the sample. The evaluation can be carried out visually, e.g. with a colour disk, or with a HACH LANGE photometer. After thorough rinsing, the measuring cuvette is then ready for the next analysis.

For order information see
 → List of reagents on page 54



ACCUVACs—the ingenious solution for 25 parameters

The secret of the ACCUVAC is the vacuum in the sealed glass cuvette containing a portioned amount of reagent. The test is carried out by immersing the tip of the ACCUVAC in the sample, then breaking it by applying moderate pressure. The vacuum draws the sample into the cuvette, whilst ensuring thorough mixing. The resulting colour is measured visually or photometrically. ACCUVAC tests are especially suitable for analysing drinking water and surface water for volatile substances such as chlorine and ozone.

For order information see
 → List of reagents on page 54



The right amount of DPD with the SWIFTEST

The SWIFTEST is a powder dispenser that releases the correct amount of DPD (diethyl-p-phenylenediamine) at the press of a button. It contains enough reagent for 250 chlorine tests (free or total chlorine). As a practical, attractively priced alternative, the SWIFTEST is ideal for laboratories with a high sample throughput, and for analysis in the field.

For order information see
 → List of reagents on page 80

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LANGE Cuvette tests— Insert, read, finish!

Our cuvette tests cover all water analysis applications: a complete solution. Together with photometers and accessories, cuvette tests form a comprehensive and accurate measuring system. From sampling and sample preparation to measurement data processing.

So easy to use

Pre-portioned, ready-to-use reagents make analysis so much simpler. Rinsing steps and reagent blank values are eliminated, reagents dosed with the required amount and results are calculated automatically. Cuvette tests come in a fully equipped box and can be used immediately, anywhere.

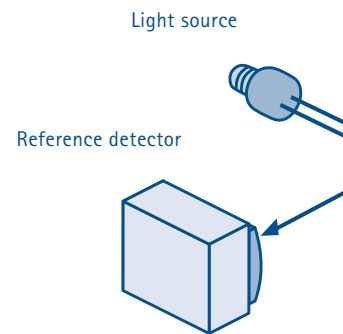
High levels of reliability

The elegant, simple handling of the cuvette tests automatically eliminates many sources of error. The cuvette is a closed system, which guarantees maximum safety for the analyst and the environment, even under the most difficult conditions.

Fast results

Cuvette tests do not require any time-consuming preparations. Solutions do not need to be prepared, and laborious calibrations and time-consuming calculations are no longer necessary, as they are integrated in the test. Plus, the measurement result is immediately available.

The multi-purpose cuvette—ready to use reagents—all you need in one cuvette!



Approved for consent limits

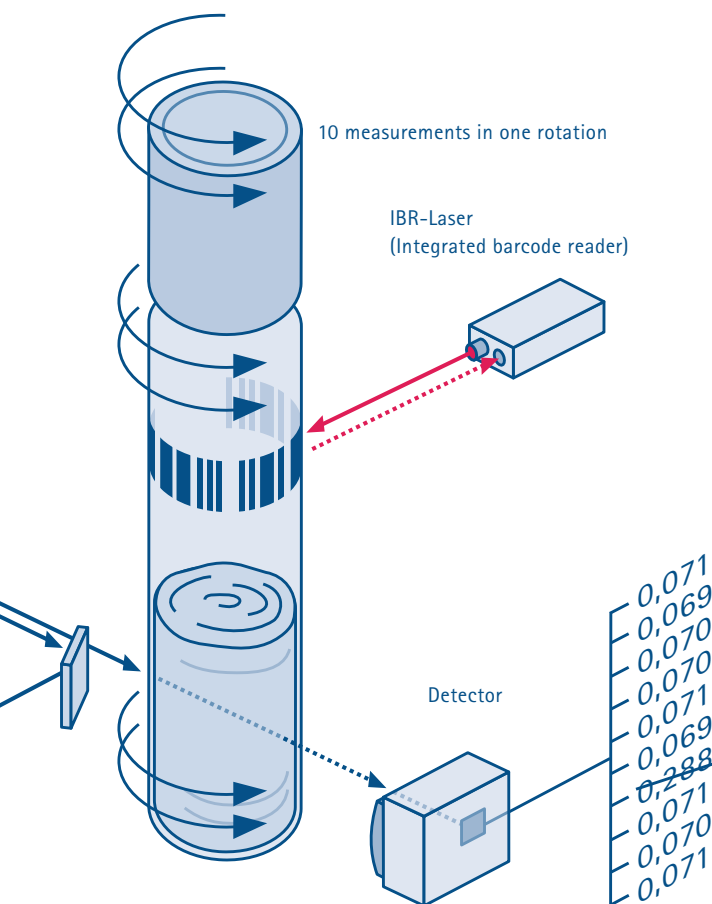
Cuvette tests are officially approved for legally required consent limits. With the help of integrated standard solutions and round robin test solutions, they provide the necessary assurance you need.

For over 50 parameters and more than 90 measuring ranges

Cuvette tests cover all water analysis applications, from highly polluted industrial wastewater to the detection of traces of contamination in drinking water.

Environmentally friendly

In comparison with conventional analysis, the multi-purpose cuvette contains considerably reduced amounts of chemicals. HACH LANGE also help users to meet their legal obligations by ensuring proper disposal.



Only with LANGE cuvette tests! As the cuvette rotates, any scratches, soil and flaws on the glass of the cuvette are detected and the measurements taken at these points are rejected.

The perfect system:

I. Fully automatic photometry

LANGE cuvette tests are automatically measured correctly the user does not even have to press a button.

The photometer:

- Identifies the cuvette test from its barcode (IBR)
- Rotates the cuvette and takes 10 measurements, eliminating outliers
- Calculates the result immediately, e.g. in mg/l

Easy to use: Insert, read, finish!

The perfect system:

II. Precision plus safety

100% safe every step of the way:

- No contact with reagents, thanks to DOSICAP ZIP
- Automatic measurement with barcode reader
- Completely reliable results with ADDISTA standards, round robin test solutions and spiking. Officially approved.

The perfect system:

III. User friendly

Simple and well-designed to prevent errors from occurring. With brief instructions and pictures on the cuvette compartment lid. Ready to use: carry out the test without having to wade through complicated instructions.

The variety of measuring ranges

PARAMETER	NUMBER	MEASURING RANGES
Acid capacity KS 4.3	1	0.5 – 8.0 mmol/l
Alcohol	1	0.01 – 0.12 g/l
Aluminium	1	0.02 – 0.5 mg/l
Ammonium	4	0.015 – 130 mg/l NH ₄ -N
AOX	2	0.05 – 0.5 mg/l
Bitter units	1	≥ 2 BU
BOD ₅	2	0.5 – 1,650 mg/l
Boron	1	0.05 – 2.5 mg/l
Cadmium	1	0.02 – 0.3 mg/l
Carbonate, CO ₂	1	55 – 550 mg/l CO ₂
Chloride	1	1 – 70 mg/l
Chlorine/Ozone	1	0.05 – 2 mg/l Cl ₂ / O ₃
Chromium (III + VI)	1	0.03 – 1 mg/l
COD	7	5 – 60,000 mg/l
Colour developer CD 2/3/4	1	0.5 – 7.5 g/l
Copper	1	0.1 – 8 mg/l
Copper baths (acidic)	1	2 – 100 g/l Cu
Cyanide	2	0.01 – 0.6 mg/l
Fluoride	1	0.1 – 1.5 mg/l
Formaldehyde	1	0.5 – 10 mg/l
Hardness, residual hardness (Ca + Mg)	2	0.1 – 100 mg/l Ca 0.15 – 50 mg/l Mg
Iron, Iron (II + III)	2	0.2 – 6 mg/l
Lead	1	0.1 – 2 mg/l
Magnesium	1	0.5 – 50 mg/l

PARAMETER	NUMBER	MEASURING RANGES
Molybdenum	2	3 – 300 mg/l
Nickel	1	0.1 – 6 mg/l
Nickel baths, acidic	1	5 – 120 g/l
Nitrate	2	0.23 – 35 mg/l NO ₃ -N 1 – 155 mg/l NO ₃
Nitrite	2	0.015 – 6 mg/l NO ₂ -N 0.05 – 20 mg/l NO ₂
Nitrogen (total), LATON	3	1 – 100 mg/l TN _b
Organic acids	1	50 – 2,500 mg/l acetic acid
Phenol	2	0.05 – 200 mg/l
Phosphorus (ortho)	1	1.6 – 30 mg/l PO ₄ -P 5 – 90 mg/l PO ₄
Phosphorus (ortho + total)	3	0.05 – 20 mg/l PO ₄ -P 0.15 – 60 mg/l PO ₄
Potassium	1	8 – 50 mg/l
Silver	2	0.04 – 2,500 mg/l
Sludge activity	1	–
Starch	1	2 – 150 mg/l
Sulphate	2	40 – 900 mg/l
Surfactants, cat. or anion.	2	0.2 – 2 mg/l
Surfactants, nonion.	2	0.3 – 20,000 mg/l
Tin	1	0.1 – 2 mg/l
TOC	5	3 – 3,000 mg/l TOC
Vicinal diketones	1	0.015 – 0.5 mg/kg diacetyl
Zinc	1	0.2 – 6 mg/l

Visual tests from HACH LANGE at a glance

Test strips

	MEASURING RANGE	SCALING	TESTS/ PKG	HAZARD CODE*	ART. NO.
5-in-1-TEST STRIPS					
5 parameters per test strip					
- Free chlorine	0 – 10 mg/l	0; 0.5; 1.0; 2.0; 4.0; 10.0	50		2755250
- Total chlorine	0 – 10 mg/l	0; 0.5; 1.0; 2.0; 4.0; 10.0			
- Total hardness as CaCO ₃	0 – 25 mg/l	0; 1.5; 3; 7; 15; 25			
- Alkalinity as CaCO ₃	0 – 425 mg/l	0; 25; 50; 120; 250; 425			
- pH	6.2 – 8.4	6.2; 6.8; 7.2; 7.8; 8.4			
ALKALINITY as CaCO₃					
	0 – 240 mg/l	0; 40; 80; 120; 180; 240	50		2744850
AMMONIUM as NH₄-N					
	0 – 6.0 mg/l	0; 0.25; 0.5; 1; 3; 6	25		2755325
ARSENIC					
	0 – 500 ppb	0; 10; 30; 50; 70; 300; 500 ppb	100	T+, F	2822800
	0 – 4,000 ppb	0; 35; 75; 175; 1,500; 4,000 ppb	100	T+, F	
CHLORIDE					
	30 – 600 mg/l	Variable; 10 – 20 steps	40		2744940
	300 – 6,000 mg/l	Variable; 100 – 200 steps	40		2751340
CHLORIDE (free + total)					
	0 – 10 mg/l	0; 0.5; 1.0; 2.0; 4.0; 10.0	50		2745050
			250		2793944
COPPER					
	0 – 3 mg/l	0; 0.2; 0.5; 1; 3	25		2745125
HARDNESS (total) as CaCO₃					
	0 – 425 mg/l	0; 25; 50; 120; 250; 425	50		2745250
			250		2793844
			1,000		2793828
IRON (total dissolved)					
	0 – 5 mg/l	0; 0.15; 0.3; 0.6; 1; 2; 5	25	Xi	2745325
NITRATE + NITRITE					
	0 – 50 mg/l NO ₃	0; 1; 2; 5; 10; 20; 50	25		2745425
	0 – 3 mg/l NO ₂	0; 0.15; 0.3; 1; 1.5; 3	25		
pH					
	4 – 9	4; 5; 6; 7; 8; 9	50		2745650
PHOSPHATE (ortho) as PO₄					
	0 – 50 mg/l	0; 5; 15; 30; 50	50		2757150

→ *Hazard symbol with description see page 60

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Test strips



Colour disk



Colour cube



Drop count test



Digital titrator

Colour disks, colour cubes and drop count tests

TYPE OF MEASUREMENT	METHOD	MEASURING RANGE	DETECTION LIMIT	TESTS/ PKG	HAZARD CODE*	ART. NO.
ACIDITY						
Drop count titration	Methyl orange, phenolphthalein	5 – 100 mg/l CaCO ₃ 20 – 400 mg/l CaCO ₃	5 mg/l 20 mg/l	100		222301
ALKALINITY						
Drop count titration	Phenolphthalein	5 – 100 mg/l CaCO ₃ 20 – 400 mg/l CaCO ₃		100		2444301
Drop count titration	Phenolphthalein	385 – 8,500 mg/l CaCO ₃		100		2314500
AMMONIUM						
Colour cube	Nessler's Reagent	0 – 2.5 mg/l NH ₄ -N	0.5 mg/l	25	T+, N	1252400
Colour cube	Salicylate	0 – 0.8 mg/l NH ₄ -N	0.2 mg/l	25	C, Xn	2267100
Colour cube	Salicylate	0 – 0.8 mg/l NH ₄ -N	0.2 mg/l	25		2266900
Colour disk NI-8	Nessler's Reagent	0 – 3 mg/l NH ₄ -N	0.1 mg/l	100	T+, N	224100
Colour disk NI-SA	Salicylate	0 – 2.5 mg/l NH ₄ -N	0.1 mg/l	100	C, Xn	2428700
BROMINE						
Colour cube	DPD	0 – 3.0 mg/l	0.6 mg/l	50		2194000
CHLORIDE						
Drop count titration 8-P	Silver nitrate	5 – 100 mg/l 20 – 400 mg/l	5 mg/l 20 mg/l	100	T, N	144001
Drop count titration CD-51	Silver nitrate	500 – 10,000 mg/l 5,000 – 100,000 mg/l	500 mg/l 5,000 mg/l	100	T, C, N	208601
CHLORINE (free)						
Colour cube	DPD	0 – 2.5 mg/l	0.5 mg/l	50		2060300
Colour disk	DPD	0 – 2.5 mg/l	0.1 mg/l	25		2502050
Colour disk CN-66F	DPD	0 – 3.5 mg/l	0.1 mg/l	100		223102
Colour disk CN-70F	DPD	0 – 0.7 mg/l 0 – 3.5 mg/l	0.02 mg/l 0.1 mg/l	200		1454201
CHLORINE (free + total)						
Colour disk CN-66	DPD	0 – 3.5 mg/l	0.1 mg/l	50/50		223101
Colour disk CN-70	DPD	0 – 0.7 mg/l 0 – 3.5 mg/l	0.02 mg/l 0.1 mg/l	100/100		1454200
Colour disk CN-80	DPD	0 – 0.7 mg/l 0 – 3.0 mg/l 0 – 10 mg/l tot.	0.02 mg/l 0.1 mg/l 0.5 mg/l tot.	100/100		2129000
CHLORINE (total)						
Colour cube	DPD	0 – 2.5 mg/l	0.5 mg/l	50		2060400
Colour disk	DPD	0 – 2.5 mg/l	0.1 mg/l	25		2503050
Colour disk CN-66T	DPD	0 – 3.5 mg/l	0.1 mg/l	100		223103
Colour disk CN-70T	DPD	0 – 0.7 mg/l 0 – 3.5 mg/l	0.02 mg/l 0.1 mg/l	200		1454202
Pipette CN-21P	Thiosulphate	10 – 200 mg/l	10 mg/l	100	Xi	2444400
Pipette CN-65	Thiosulphate	0.2 – 4 mg/l 1 – 20 mg/l	0.2 mg/l 1.0 mg/l	100	Xi	225401

→ *Hazard symbol with description see page 60

Visual tests (2)

Colour disks, colour cubes and drop count tests (2)

TYPE OF MEASUREMENT	METHOD	MEASURING RANGE	DETECTION LIMIT	TESTS/ PKG	HAZARD CODE*	ART. NO.
CHROMIUM (III, VI)						
Colour cube CH-12	Diphenylcarbazide hypobromite oxidation	0 – 1.5 mg/l	0.1 mg/l	50/50	T, C	222800
CHROMIUM (VI)						
Colour cube	Diphenylcarbazide	0 – 1.0 mg/l	0.2 mg/l	50	Xi	1252700
Colour disk CH-8	Diphenylcarbazide	0 – 1.5 mg/l	0.1 mg/l	100	Xi	183400
Drop count titration CH-14	Diphenylcarbazide	5 – 100 mg/l 50 – 1,000 mg/l	5 mg/l	100	Xi	222702
COLOUR						
Colour disk CO-1	APHA platinum-cobalt standard	0 – 100 units 0 – 500 units	5 units 25 units			223400
COPPER						
Colour cube	Bicinchoninate/hydrosulphite	0 – 2.5 mg/l	0.5 mg/l	25	Xn	2182200
Long-path colour cube	Porphyrine	0 – 0.25 mg/l	0.05 mg/l	50	Xn	2193800
COPPER (free + total)						
Colour disk CU-5	Bicinchoninate hydrosulphite reduction	0 – 5 mg/l	0.1 mg/l	100		1421300
COPPER (free)						
Colour disk CU-6	Bicinchoninate	0 – 5 mg/l	0.1 mg/l	100	Xn	2194100
CYANIDE (free)						
Colour cube CYN-3	Pyrdine-pyrazolone	0 – 0.3 mg/l	0.01 mg/l	100		201002
CYANURIC ACID						
Turbidity CY-3	Turbidity	20 – 100 mg/l	20 mg/l	50		185102
DETERGENTS (anionic)						
Colour disk DE-2	Toluidine blue chloroform	0 – 1.0 mg/l	0.05 mg/l	32	Xn	143203
FORMALDEHYDE						
Colour comparison FM-2	MBTH	0; 0.5; 1.5	0.5	100	Xn, N	2267200
Drop count titration FM-1	Thymolphthalein	0.05 – 1% 0.5 – 10%	0.05% 0.50%	100	Xn, Xi, F	2183100
GLUTARALDEHYDE						
Colour disk		0.5 – 4,000 mg/l	0.5 mg/l	100	C, Xn	2587200
GLYCOL in oil or water						
Colouration EG-1	Presence/absence	0 – >150 mg/l		25	T, C	2185600
HARDNESS (total + Ca + Mg) as CaCO₃						
Drop count titration HA-4P	EDTA	17 – 340 mg/l	17 mg/l	100	C	145700
Drop count titration HA-4P/MG-L	EDTA	20 – 400 mg/l	20 mg/l	100	C	145701

→ *Hazard symbol with description see page 60

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Test strips



Colour disk



Colour cube



Drop count test



Digital titrator

TYPE OF MEASUREMENT	METHOD	MEASURING RANGE	DETECTION LIMIT	TESTS/ PKG	HAZARD CODE*	ART. NO.
HARDNESS (total) as CaCO₃						
Drop count titration 5-EP MG-L	EDTA	20 – 400 mg/l	20 mg/l	100	Xn	145401
Drop count titration 5-B	EDTA	17 – 510 mg/l	17 mg/l	100	Xi	145300
Drop count titration 5-EP	EDTA	17 – 510 mg/l	17 mg/l	100	Xn	145400
Drop count titration HA-71A	EDTA	1 – 20 mg/l	1 mg/l	100	Xi	145201
HYDRAZINE						
Colour disk HY-2	P-dimethylamin-benzaldehyde	0 – 1.0 mg/l	0.02 mg/l	300	C	184900
HYDROGEN PEROXIDE						
Drop count titration	Thiosulphate	0.2 – 2 mg/l 1 – 10 mg/l	0.2 mg/l 1 mg/l	100	Xi	2291700
HYPOCHLORITE						
Drop count titration CH-HR	Thiosulphate	5 – 15% Cl ₂ 50 – 150 g/l Cl ₂	0.05%	100	Xi	2687200
IODINE						
Colour cube	DPD	0 – 2.5 mg/l	0.5 mg/l	50		2193900
IRON						
ACCUVAC kit	1.10 phenanthroline	0 – 10 mg/l	0.2 mg/l	25	Xn	2507050
Colour cube	1.10 phenanthroline	0 – 5 mg/l	1 mg/l	50	Xn	1400800
Colour cube	1.10 phenanthroline	0 – 10 mg/l	2 mg/l	50	Xn	2543500
Colour disk IR-18	1.10 phenanthroline	0 – 5 mg/l	0.1 mg/l	100	Xn	146400
Colour disk IR-18A	1.10 phenanthroline	0 – 1 mg/l	0.02 mg/l	100	Xn	146500
Colour disk IR-18B	1.10 phenanthroline	0 – 10 mg/l	0.2 mg/l	100	Xn	146401
Colour disk IR-21	TPTZ	0 – 0.1 mg/l 0 – 1.2 mg/l	0.01 mg/l 0.05 mg/l	100	Xn	2299300
Colour disk IR-24	FerroZine	0 – 0.2 mg/l 0 – 1.0 mg/l	0.002 mg/l 0.01 mg/l	50	T	255600
IRON (II)						
Colour disk IR-18C	1.10 phenanthroline	0 – 10 mg/l	0.2 mg/l	100	Xn, N	2667200
MANGANESE						
Colour disk MN-5	Periodate	0 – 3.0 mg/l	0.1 mg/l	100	Xi, O	146700
Colour disk MN-PAN	PAN	0 – 0.7 mg/l	0.05 mg/l	50	T, N	2350800
MOLYBDENUM						
Colour disk MO-2	Mercaptoacetic acid	0 – 10 mg/l 0 – 50 mg/l	0.2 mg/l 1 mg/l	100	Xi, Xn	1419301
Colour disk MO-LR	Ternary complex	0 – 3 mg/l	0.1 mg/l	100		2359300
NITRATE						
ACCUVAC, colour disk, colour cube	Cadmium reduction	0 – 50 mg/l NO ₃ -N	1 mg/l	25	Xn	2511050
Colour cube	Cadmium reduction	0 – 50 mg/l NO ₃ -N	10 mg/l	50	T, N	1403700
Colour disk NI-11	Cadmium reduction	0 – 50 mg/l NO ₃ -N	1 mg/l	100	T, N	146803
Colour disk NI-14	Cadmium reduction	0 – 1 mg/l NO ₃ -N 1 – 10 mg/l NO ₃ -N	0.02 mg/l 0.2 mg/l	100	T, N	1416100

→ *Hazard symbol with description see page 60

Visual tests (3)

Colour disks, colour cubes and drop count tests (3)

TYPE OF MEASUREMENT	METHOD	MEASURING RANGE	DETECTION LIMIT	TESTS/ PKG	HAZARD CODE*	ART. NO.
NITRATE + NITRITE						
Colour disk NI-12	Cadmium reduction Diazotization	0 – 50 mg/l NO ₃ -N 0 – 0.5 mg/l NO ₂ -N	1 mg/l 0.01 mg/l	100	T, N	1408100
NITRITE						
Colour cube	Diazotization	0 – 1.0 mg/l NO ₂ -N	0.2 mg/l	50	Xi	2059600
Colour disk NI-6	Diazotization	0 – 100 mg/l NO ₂ 0 – 2,000 mg/l NO ₂	2 mg/l 40 mg/l	100	Xi	224000
Colour disk NI-15	Diazotization	0 – 0.5 mg/l NO ₂ -N	0.01 mg/l	100	Xi	2182000
OXYGEN						
Colour disk/ACCUVAC	Winkler	0 – 1 mg/l	0.05 mg/l	25		2501050
Colour disk/ACCUVAC	Winkler	0 – 15 mg/l	0.2 mg/l	25	Xi	2515050
Drop count titration OX-2P	Winkler	0.2 – 4 mg/l 1 – 20 mg/l	0.2 mg/l 0.2 mg/l	100	C, T, N	146900
OXYGEN SCAVENGER						
Colour disk DH-1	Iron reduction	0 – 0.065 mg/l DEHA 0 – 0.375 mg/l DEHA 0 – 1.7 mg/l DEHA	0.001 mg/l 0.005 mg/l 0.023 mg/l	100	C	2168200
OZONE						
ACCUVAC	Indigo	0 – 0.25 mg/l	0.01 mg/l	12/24	Xn	2516050
ACCUVAC	Indigo	0 – 0.75 mg/l	0.02 mg/l	12/24	Xn	2517050
ACCUVAC	Indigo	0 – 1.5 mg/l	0.05 mg/l	12/24	Xn	2518050
Colour disk OZ-2	DPD	0 – 2.3 mg/l	0.05 mg/l	100		2064400
pH						
Colour cube	Phenol red	6.5 – 8.5	0.5	50		1251900
Colour cube	Bromothymol blue	5.5 – 7.5	0.5	50		2067100
Colour disk 17D	Dinitrophenol	3 – 5	0.1	200	T	147004
Colour disk 17F	Bromothymol blue	5.5 – 8.5	0.1	200	T	147006
Colour disk 17H	Phenol red	6.5 – 8.5	0.1	200	T	147008
Colour disk 17J	Thymol blue	7.8 – 10	0.1	200	T	147009
Colour disk 17M	Alizarin yellow	9.7 – 11.6	0.1	200	T	147010
Colour disk 17N	Mixed indicator	4 – 10	0.5	300	T	147011
Colour disk 17S	Bromocresol purple	5.2 – 6.8	0.1	200	T	147014
PHENOL						
Colour disk PL-1	Aminoantipyrine	0 – 1 mg/l 0 – 5 mg/l	0.02 mg/l 0.1 mg/l	100	Xi, Xn, O	2483600
PHOSPHATE (ortho)						
Colour cube	Ascorbic acid	0 – 5 mg/l PO ₄	1 mg/l	50	Xi	1252200
Colour disk PO-14	Tin method	0 – 4.5 mg/l PO ₄ 0 – 45 mg/l PO ₄	0.1 mg/l 1 mg/l	100	C	147500
Colour disk PO-19	Ascorbic acid	0 – 1 mg/l PO ₄ 0 – 5 mg/l PO ₄ 0 – 50 mg/l PO ₄	0.02 mg/l 0.1 mg/l 1 mg/l	100	Xi	224800
Colour disk PO-19A incl. filtration	Ascorbic acid	0 – 1 mg/l PO ₄ 0 – 5 mg/l PO ₄ 0 – 50 mg/l PO ₄	0.02 mg/l 0.1 mg/l 1 mg/l	100	Xi	224801
Colour disk/ACCUVAC kit	Ascorbic acid	0 – 5 mg/l PO ₄	0.1 mg/l	25	Xi	2508050

→ *Hazard symbol with description see page 60

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Test strips



Colour disk



Colour cube



Drop count test



Digital titrator

TYPE OF MEASUREMENT	METHOD	MEASURING RANGE	DETECTION LIMIT	TESTS/ PKG	HAZARD CODE*	ART. NO.
PHOSPHATE (ortho + meta)						
Colour disk PO-23	PhosVer3	0 – 5 mg/l PO ₄ 0 – 50 mg/l PO ₄	0.1 mg/l 1 mg/l	100	C	224902
Colour disk PO-23A incl. filtration	PhosVer3	0 – 5 mg/l PO ₄ 0 – 50 mg/l PO ₄	0.1 mg/l 1 mg/l	100	C	224903
PHOSPHATE (total)						
Colour disk PO-24	PhosVer3, digestion	0 – 1 mg/l PO ₄ 0 – 5 mg/l PO ₄ 0 – 50 mg/l PO ₄	0.02 mg/l 0.1 mg/l 1 mg/l	50	C, O	225001
PHOSPHONATE						
Colour disk PN-10	UV digestion Ascorbic acid	0 – 5 mg/l PO ₄ 0 – 125 mg/l PO ₄	1 mg/l	100		2113302
SILICA						
Colour disk SI-5	Heteropoly blue	0 – 40 mg/l 0 – 800 mg/l	1 mg/l 20 mg/l	100	Xi, Xn	1455400
Colour disk SI-7	Heteropoly blue	0 – 1 mg/l	0.02 mg/l	100	Xn, Xi	2255000
SULPHATE						
Turbidity SF-1	Turbidity	50 – 200 mg/l	50 mg/l	100		225100
SULPHIDE						
Colour disk HS-WR	Methylene blue	0 – 0.55 mg/l 0 – 2.25 mg/l 0 – 11.25 mg/l	0.01 mg/l 0.5 mg/l 2.5 mg/l	60 60 30	T, C	223801
SULPHITE						
Drop count titration SU-5	Iodometry	1 – 20 mg/l 10 – 200 mg/l	1 mg/l 10 mg/l	100	Xi	148002
TANNIN/LIGNIN						
Colour disk TA-3	Tyrosine	0 – 15 mg/l 0 – 150 mg/l	0.5 mg/l 5 mg/l	100	T, F	193701
TRIAZOLES						
Colour disk TZ-1	As benzotriazole	0 – 15 mg/l	0.5 mg/l	50		2167502
WATER in oil						
Volumetric WO-1	Calcium hydride	0 – 1% 0 – 10%	0.05 mg/l 0.2 mg/l	25	F	2237300

→ *Hazard symbol with description see page 60

Visual tests (4)

Tests with cartridges for the digital titrator

MEASURING RANGE	METHOD	DETECTION LIMIT	TESTS/ PKG	HAZ. CODE*	ART. NO.
ACID					
See manual	Titration with lye				
ACIDITY					
10 – 4,000 mg/l CaCO ₃	Methyl orange/phenolphthalein	10 mg/l	100	C	2272800
ACIDS (volatile)					
100 – 2,400 mg/l	Sodium hydroxide	100	100		2460200
ALKALINITY					
10 – 4,000 mg/l CaCO ₃	Phenolphthalein	10 mg/l	100	Xi	2271900
See manual	Acid titration				
CALCIUM					
10 – 160 mg/l	CalVer/EDTA	10 mg/l	100	C	2447200
100 – 4,000 mg/l	CalVer/EDTA	100 mg/l	100	C	2447500
CHLORIDE					
10 – 8,000 mg/l	Mercury nitrate	10 mg/l	100	T+, N	2272600
10 – 10,000 mg/l	Silver nitrate	10 mg/l	50	T, C, N	2288000
CHLORINE (free + total)					
0 – 3.0 mg/l	DPD	0.05 mg/l	100		2445300
CHLORINE (total)					
20 – 2,000 mg/l	Thiosulphate	20 mg/l	100		2272500
CHROMATE					
20 – 400 mg/l	Sodium thiosulphate	20 mg/l	100		2272400
CHROMIUM (VI)					
20 – 400 mg/l	Thiosulphate	20 mg/l	100		2272400
HARDNESS (Ca)					
1 – 16 °dH	CalVer/EDTA	1 °dH	100		2447300
10 – >100 °dH	CalVer/EDTA	10 °dH	100	C	2447400
10 – 160 mg/l CaCO ₃	CalVer/EDTA	10 mg/l CaCO ₃	100	C	2447200
100 – 4,000 mg/l CaCO ₃	CalVer/EDTA	100 mg/l CaCO ₃	100	C	2447500
HARDNESS (total)					
1 – 16 °dH	ManVer/EDTA	1 °dH	100	Xi	2447800
10 – >100 °dH	ManVer/EDTA	10 °dH	100	Xi	2447900
10 – 160 mg/l CaCO ₃	ManVer/EDTA	10 mg/l CaCO ₃	100	Xi	2448000
100 – 4,000 mg/l CaCO ₃	ManVer/EDTA	100 mg/l CaCO ₃	100	Xi	2448100
HARDNESS (total + Ca + Mg)					
10 – >100 °dH	EDTA	10 °dH	100	C	2448500
10 – 160 mg/l CaCO ₃	EDTA	10 mg/l CaCO ₃	100	C	2448600
100 – 4,000 mg/l CaCO ₃	EDTA	100 mg/l CaCO ₃	100	C	2448700

→ More information about the digital titrator: see page 77

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Test strips



Colour disk



Colour cube



Drop count test



Digital titrator

MEASURING RANGE	METHOD	DETECTION LIMIT	TESTS/ PKG	HAZ. CODE*	ART. NO.
HYPOCHLORITE					
50 – 150 g/l Cl ₂	Iodometric	50 g/l	100		2687000
IRON					
10 – 100 mg/l	Sulphosalicylic acid/EDTA	10 mg/l	100		2449200
100 – 1,000 mg/l	Sulphosalicylic acid/EDTA	100 mg/l	100		2449300
MAGNESIUM					
1 – 20 mg/l	EDTA	1 mg/l	100	C	2447200
20 – 200 mg/l	EDTA	20 mg/l	100	C	2447500
NITRITE					
100 – 2,500 NaNO ₂	Cerimetric		C.100		2270701
OXYGEN					
1 – 10 mg/l	Winkler	1 mg/l	50	T, C, N	2272200
SULPHITE					
10 – 800 mg/l	Iodometric	0.4 – 4 mg/l	100	Xi	2272300

WW

DW

PW

5

WW
DW
PW

Photometric tests from HACH LANGE at a glance

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
ACID CAPACITY KS 4.3																	
LCK	0.5 – 8.0 mmol/l	LANGE method	•	•	•	•	•	•									LCK362
ALACHLOR in water																	
IM	Threshold value (ppb)	Immunoassay	•	•						•			•	•		T	2813000
ALCOHOL																	
LCK	0.01 – 0.12 g/l	Alcohol oxidase	•	•	•	•	•	•									LCK300
ALUMINIUM																	
LCK	0.02 – 0.5 mg/l	Chromazurol S	•	•	•	•	•	•								T	LCK301
PP	0.002 – 0.250 mg/l	Eriochrome cyanine R	•	•									•	•		Xn, F	2603700
PP	0.008 – 0.800 mg/l	Aluminon	•	•						•	•	•	•	•	•	Xi	2242000
AMMONIUM																	
LCK	0.015 – 2 mg/l NH ₄ -N	Indophenol blue	•	•	•	•	•	•								Xn, N	LCK304
LCK	1 – 12 mg/l NH ₄ -N	Indophenol blue	•	•	•	•	•	•								Xn, N	LCK305
LCK	2 – 47 mg/l NH ₄ -N	Indophenol blue	•	•	•	•	•	•								Xn, N	LCK303
LCK	47 – 130 mg/l NH ₄ -N	Indophenol blue	•	•	•	•	•	•								Xn, N	LCK302
PP	0.01 – 0.50 mg/l NH ₄ -N	Salicylate	•	•							•	•	•	•		C, Xn	2668000
RS	0.02 – 2.50 mg/l NH ₄ -N	Nessler	•	•									•	•		C	2458200
TNT	0.02 – 2.50 mg/l NH ₄ -N	Salicylate									•	•	•	•		C, Xn	2604545
TNT	0.4 – 50.0 mg/l NH ₄ -N	Salicylate									•	•	•	•		C, Xn	2606945
AMMONIUM (quarternary compounds)																	
PP	0.2 – 5.0 mg/l CTAB	Direct binary complex	•	•									•	•		Xi	2459200
AOX																	
LCK	0.05 – 3 mg/l		•	•	•	•	•	•								T, C, F	LCK390
AOX (fast digestion)																	
LCK	0.005 – 0.5 mg/l		•	•	•	•	•	•								T, C, F	LCK391
ARSENIC																	
RS	0 – 0.200 mg/l	Silver diethyldithiocarbamate	•	•									•	•			
ATRAZINE																	
IM	Lower ppb	Immunoassay	•	•									•	•		T	2762700
BARIUM																	
PP	1 – 100 mg/l	Turbidity measurement	•	•									•	•		Xi	1206499
AV	1 – 100 mg/l	Turbidity measurement	•	•									•	•		Xi	2513025
BENZOTRIAZOLE or TOLYTRIAZOLE																	
PP	1 – 16 mg/l 1 – 20 mg/l	UV	•	•									•	•	•	Xn	2141299

LCK	→	LANGE cuvette test	HPT	→	HACH pipette test	RS	→	Reagent solution
LCW	→	LANGE pipette test	PP	→	Powder Pillow test	IM	→	Immunoassay
TNT	→	TEST'N'TUBE	AV	→	ACCUVAC	RL	→	Rapid liquid system

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

Cuvette Test (LCK)

Powder Pillow (PP)

ACCUVAC (AV)

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
BITTER UNITS																	
LCK	≥ 2 BU	MEBAK	●						●							F, Xn, N	LCK241
BOD₅																	
LCK	0.5 – 12 mg/l	Dilution method	●	●	●	●	●	●	●							Xi	LCK554
LCK	4 – 1,650 mg/l	Dilution method	●	●	●	●	●	●	●							C, O	LCK555
BORON																	
LCK	0.05 – 2.5 mg/l	Azomethine H	●	●	●	●	●	●	●								LCK307
PP	0.2 – 14.0 mg/l	Carminie method	●	●									●	●			1417099
PP	0.02 – 1.50 mg/l	Azomethine H	●	●								●	●	●	●	Xi	2666900
BROMINE																	
PP	0.05 – 4.50 mg/l	DPD	●	●						●	●	●	●	●	●		2105669
AV	0.05 – 4.50 mg/l	DPD	●	●						●	●	●	●	●	●		2503025
CADMIUM																	
LCK	0.02 – 0.3 mg/l	Cadion	●	●	●	●	●	●	●							T, N	LCK308
RS	0 – 80 µg/l	Dithizone	●	●											●	T+, C, N	224200
CARBONATE/CARBON DIOXIDE																	
LCK	55 – 550 mg/l CO ₂	pH indicator	●	●	●		●	●	●								LCK388
CHLORAMINE (mono)																	
TNT	0.1 – 10.0 mg/l Cl ₂	Indophenol									●	●	●	●		C, Xn	2805145
TNT	0.04 – 4.50 mg/l Cl ₂	Indophenol								●	●	●	●	●		C, Xn	2802246
CHLORIDE																	
LCK	1 – 70 mg/l 70 – 1,000 mg/l	Iron III thiocyanat	●	●	●	●	●	●	●							T, C	LCK311
RS	0.1 – 25.0 mg/l	Mercury thiocyanate	●	●									●	●		T, C, F	2319800

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Photometric tests (2)

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
CHLORINE (free)																	
PP	0.02 – 2.00 mg/l	DPD	●	●						●	●	●	●	●	●		2105569
AV	0.02 – 2.00 mg/l	DPD	●	●						●	●	●	●	●	●		2502025
PP	0.1 – 5.0 mg/l	DPD								●	●	●					1407099
PP	0.1 – 10 mg/l	DPD	●	●									●	●			1407099
RL	0.02 – 2.00 mg/l	DPD	●	●									●		Xi, Xn		2556900
TNT	0.09 – 5.00 mg/l	DPD								●	●	●	●	●			2105545
CHLORINE (total)																	
AV	0.02 – 2.00 mg/l	DPD	●	●						●	●	●	●	●	●		2503025
PP	0.02 – 2.00 mg/l	DPD	●	●						●	●	●	●	●	●		2105669
PP	0.1 – 5 mg/l	DPD								●	●	●					1406499
PP	0.1 – 10 mg/l	DPD	●	●									●	●			1406499
RL	0.02 – 2.00 mg/l	DPD	●	●									●		C, Xn		2557000
RL	2 – 500 µg/l	DPD	●	●									●	●	Xi		2563000
TNT	0.09 – 5.00 mg/l	DPD								●	●	●	●	●			2105645
CHLORINE DIOXIDE																	
AV	0.01 – 1.00 mg/l ClO ₂	Chlorophenol red	●	●									●	●	Xi		2242300
AV	0.04 – 5.00 mg/l ClO ₂	DPD/glycine	●	●						●	●	●	●	●			2771000
HPT	0.003 – 0.500 mg/l ClO ₂	Amaranth	●	●						●	●	●	●	●			HPT240
PP	0.04 – 5.00 mg/l ClO ₂	DPD/glycine	●	●						●	●	●	●	●			2770900
CHLORINE/OZONE																	
LCW	0.05 – 1.5 mg/l Cl ₂ /O ₃	DPD	●	●	●	●	●	●									LCW510
	0.03 – 0.4 mg/l Cl ₂ /O ₃																
CHLORINE/OZONE/CHLORINE DIOXIDE																	
LCK	0.05–2 mg/l Cl ₂ /O ₃	DPD	●	●	●	●	●	●									LCK310
	0.09 – 3.8 mg/l Cl ₂ O																
CHROMIC ACID BATHS																	
LCK	50 – 450 g/l CrO ₃	Intrinsic bath colour	●	●	●	●	●	●								Xi	LCK213
CHROMIUM																	
LCK	0.005 – 0.25 mg/l	Diphenylcarbazide	●	●	●	●	●	●								Xn, Xi	LCS313
PP	0.01 – 0.70 mg/l	Hypobromite oxidation	●	●						●	●	●	●	●	T, C		2242500
CHROMIUM (III + VI)																	
LCK	0.03 – 1 mg/l	Diphenylcarbazide	●	●	●	●	●	●								Xn, Xi	LCK313
CHROMIUM (VI)																	
PP	0.01 – 0.70 mg/l	1.5-diphenylcarbohydrazide	●	●						●		●	●	●	Xi		1271099
AV	0.01 – 0.70 mg/l	1.5-diphenylcarbohydrazide	●	●						●		●	●	●	Xi		2505025
COBALT																	
PP	0.01 – 2.00 mg/l	PAN	●	●									●	●	T		2651600

LCK	→	LANGE cuvette test	HPT	→	HACH pipette test	RS	→	Reagent solution
LCW	→	LANGE pipette test	PP	→	Powder Pillow test	IM	→	Immunoassay
TNT	→	TEST'N'TUBE	AV	→	ACCUVAC	RL	→	Rapid liquid system

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

Cuvette Test (LCK)

Powder Pillow (PP)

ACCUVAC (AV)

TYPE	MEASURING RANGE	METHOD	METHODS											HAZARD CODE*	ART. NO.		
			DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890			DR 2400/2500	DR 4000
COD																	
LCK	5 – 60 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK414
TNT	0 – 40 mg/l	Chromosulphuric acid											● ¹⁾	●		C	2415851
LCK	1,000 – 10,000 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK014
LCK	5,000 – 60,000 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK914
LCK	15 – 150 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK314
LCK	50 – 300 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK614
LCK	100 – 2,000 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK514
LCK	150 – 1,000 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCK114
TNT	3 – 150 mg/l	Chromosulphuric acid											●	●		C	2125851
TNT	20 – 1,500 mg/l	Chromosulphuric acid										●	●	●	●	T, C	2125951
TNT	30 – 1,000 mg/l	Manganese (III) Reactor digestion									●	●	●	●	●	C	2623451
TNT	200 – 15,000 mg/l	Chromosulphuric acid										●	●	●	●	T, C	2415951
COD ISO																	
LCK	0 – 1,000 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCI400
LCK	0 – 150 mg/l	Chromosulphuric acid	●	●	●	●	●	●	●							T, C	LCI500
COLOUR																	
RS	5 – 500 units	Platinum-cobalt standard	●	●									●	●	●		
COLOUR DEVELOPER CD 2/3/4																	
LCK	0.5 – 7.5 g/l	LANGE method	●	●	●		●	●	●							Xn	LCK395
COPPER																	
AV	0.04 – 5.00 mg/l	Bicinchoninat	●	●						●			●	●	●	Xn	2504025
LCK	0.01 – 1 mg/l	Bathocuproine disulphonic acid	●	●	●		●	●	●								LCK529
LCK	0.1 – 8 mg/l	Bathocuproine disulphonic acid	●	●	●	●	●	●	●								LCK329
PP	0.04 – 5.00 mg/l	Bicinchoninat	●	●						●			●	●	●		2105869
PP	2 – 210 µg/l	Porphyrine	●	●									●	●	●	Xn	2603300

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Photometric tests (3)

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
COPPER BATHS (acidic)																	
LCK	2 – 100 g/l Cu	Intrinsic bath colour	●	●	●	●	●	●								Xi	LCK229
CYANIDE																	
PP	0.001 – 0.240 mg/l	Pyridine-pyrazalone	●	●							●	●	●	●			2430200
CYANIDE (easily liberatable)																	
LCK	0.03 – 0.35 mg/l	LANGE method	●	●	●	●	●	●								Xi, N	LCK319
CYANIDE (free)																	
LCK	0.01 – 0.6 mg/l	Barbituric acid-pyridine	●	●	●	●	●	●									LCK315
CYANURIC ACID																	
PP	5 – 50 mg/l	Turbidity measurement	●	●							●	●	●	●			246066
FLUORIDE																	
AV	0.02 – 2.00 mg/l	SPADNS	●	●						●		●	●	●		C	2506025
LCK	0.1 – 1.5 mg/l	SPADNS	●	●	●	●	●	●									LCK323
RS	0.02 – 2.00 mg/l	SPADNS	●	●						●	●	●	●	●		C	44449
FORMALDEHYDE																	
LCK	0.5 – 10 mg/l	Acetylacetone	●	●	●	●	●	●									LCK325
LCK	0.01 – 1 mg/l	Acetylacetone	●	●	●	●	●	●									LCS325
PP	3 – 500 µg/l	MBTH	●	●									●	●		Xn	2257700
HARDNESS (Ca + Mg)																	
LCK	1 – 20 °dH 5 – 100 mg/l Ca 3 – 50 mg/l Mg	Metal phthalein	●	●	●	●	●	●									LCK327
RL	0.07 – 4.00 mg/l CaCO ₃	Calmagite	●	●							●	●	●	●	●	C	2319900
RL	1 – 1,000 µg/l CaCO ₃	Chlorophosphonazo	●	●									●	●			2603100
HARDNESS (residual) (Ca + Mg)																	
LCK	0.02 – 0.6 °dH 0.1 – 2 mg/l Ca 0.15 – 2 mg/l Mg		●	●	●	●	●	●								Xi	LCK427
HYDRAZINE																	
AV	4 – 600 µg/l	P-dimethylamino-benzaldehyd	●	●								●	●	●		C	2524025
LCW	0.01 – 2 mg/l	4-dimethylamino-benzaldehyd	●	●	●		●	●	●								LCW025
RS	4 – 600 µg/l	P-dimethylamino-benzaldehyd	●	●								●	●	●			179032
HYDROGEN PEROXIDE																	
LCW	1 – 10 g/l		●	●	●		●	●	●								LCW058

LCK	→	LANGE cuvette test	HPT	→	HACH pipette test	RS	→	Reagent solution
LCW	→	LANGE pipette test	PP	→	Powder Pillow test	IM	→	Immunoassay
TNT	→	TEST'N'TUBE	AV	→	ACCUVAC	RL	→	Rapid liquid system

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

Cuvette Test (LCK)

Powder Pillow (PP)

ACCUVAC (AV)

TYPE	MEASURING RANGE	METHOD	METHODS											HAZARD CODE*	ART. NO.			
			DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890			DR 2400/2500	DR 4000	
IODINE																		
PP	0.07 – 7.00 mg/l	DPD	●	●											●	●		2105669
AV	0.07 – 7.00 mg/l	DPD	●	●											●	●		2503025
IRON																		
AV	0.02 – 3.00 mg/l	FerroVer	●	●						●	●	●	●	●	●	●	Xn	2507025
AV	0.012 – 1.800 mg/l	TPTZ	●	●						●		●	●	●	●	●	Xi	2510025
LCK	0.2 – 6 mg/l	1.10 Phenanthroline	●	●	●	●	●	●	●									LCK321
LCW	0.01 – 1 mg/l	1.10 Phenanthroline	●	●	●		●	●	●									LCK521
LCW	0.005 – 0.250 mg/l 0.05 – 2.00 mg/l	FerroZine	●	●	●		●	●	●								C	LCW021
PP	0.01 – 1.80 mg/l	FerroMo	●	●								●	●	●	●	●		2544800
PP	0.02 – 3.00 mg/l	FerroVer	●	●						●	●	●	●	●	●	●	Xn	2105769
PP	0.009 – 1.400 mg/l	FerroZine	●	●								●	●	●	●	●	T, N	230166
PP	0.012 – 1.800 mg/l	TPTZ	●	●						●		●	●	●	●	●	Xn	2608799
RL	0.009 – 1.400 mg/l	FerroZine	●	●								●	●	●	●	●	T, N	230149
RS	0.009 – 1.400 mg/l	FerroZine	●	●								●	●	●	●	●	T, N	230153
IRON (II)																		
AV	0.02 – 3.00 mg/l	1.10 Phenanthroline	●	●							●	●	●	●	●	●	Xn,N	2514025
PP	0.02 – 3.00 mg/l	1.10 Phenanthroline	●	●							●	●	●	●	●	●	Xn,N	103769
IRON (II, III)																		
LCK	0.2 – 6 mg/l	1.10 Phenanthroline	●	●	●	●	●	●	●								Xi	LCK320
LEAD																		
LCK	0.1 – 2 mg/l	PAR	●	●	●	●	●	●	●								T+, N	LCK306
RS	0 – 300 µg/l	Dithizone														●	T+, C, N	2243100
RS	5 – 150 µg/l	Column extraction	●	●						●					●	●	C	2375000
MAGNESIUM																		
LCK	0.5 – 50 mg/l	Metal phthalein	●	●	●	●	●	●	●									LCK326
MANGANESE																		
LCW	0.2 – 5 mg/l 0.02 – 1 mg/l	Formaldoxime	●	●	●		●	●	●								T, C	LCW032
PP	0.2 – 20.0 mg/l	Periodate oxidation	●	●						●	●	●	●	●	●	●	Xi, O	2430000
PP	0.007 – 0.700 mg/l	PAN	●	●						●		●	●	●	●	●	T, N	2651700
MENTHOL (in distillate)																		
LCK	0.5 – 15 mg/100 ml	LANGE method	●	●	●		●										C	LCW185
MERCURY																		
RS	0.1 – 2.5 µg/l	Cold vapour concentration	●	●											●	●	T, C, O	2658300
MOLYBDATE/MOLYBDENUM																		
AV	0.3 – 40.0 mg/l	Mercaptoacetic acid	●	●									●	●	●	●	Xn	2522025
PP	0.3 – 40.0 mg/l	Mercaptoacetic acid	●	●									●	●	●	●	Xi, Xn	2604100
PP	0.02 – 3.00 mg/l	Ternary complex	●	●						●		●	●	●	●	●		2449400
LCK	3 – 300 mg/l	Thioglycolic acid	●	●	●		●	●	●								T	LCK330

*) Not measurable on DR 2400

Please note: the measuring ranges can vary from instrument to instrument!

→ *Hazard symbol with description see page 60

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Photometric tests (4)

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
NICKEL																	
LCK	0.05 – 1 mg/l	Dimethylglyoxime	●	●	●		●	●	●							C	LCK537
LCK	0.1 – 6 mg/l	Dimethylglyoxime	●	●	●	●	●	●	●							C	LCK337
PP	0.02 – 1.80 mg/l	Heptoxime	●	●									●	●	Xn	2243500	
PP	0.007 – 1.000 mg/l	PAN	●	●										●	T	2242600	
PP	0.007 – 1.000 mg/l	PAN	●	●					●			●	●		T	2651600	
NICKEL BATHS (acidic)																	
LCK	5 – 120 g/l	Intrinsic bath colour	●	●	●	●	●	●								Xi	LCK237
NITRATE																	
LCK	0.23 – 13.5 mg/l NO ₃ -N 1 – 60 mg/l NO ₃	2.6-dimethylphenol	●	●	●	●	●	●								C	LCK339
AV	0.1 – 10.0 mg/l NO ₃ -N	Cadmium reduction	●	●								●	●	●	T, N	2511025	
AV	0.3 – 30.0 mg/l NO ₃ -N	Cadmium reduction	●	●								●	●	●	T, N	2511025	
LCK	5 – 35 mg/l NO ₃ -N 22 – 155 mg/l NO ₃	2.6 dimethylphenol	●	●	●	●	●	●								C	LCK340
PP	0.01 – 0.50 mg/l NO ₃ -N	Cadmium reduction	●	●						●	●	●	●	●	T, N	2429800	
PP	0.1 – 10.0 mg/l NO ₃ -N	Cadmium reduction	●	●								●	●	●	T, N	2106169	
PP	0.3 – 30.0 mg/l NO ₃ -N	Cadmium reduction	●	●					●	●	●	●	●	●	T, N	2106169	
TNT	0.2 – 30.0 mg/l NO ₃ -N	Chromotropic acid										●	●	●	C	2605345	

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



Cuvette Test (LCK)



Powder Pillow (PP)



ACCUVAC (AV)

- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

TYPE	MEASURING RANGE	METHOD	DR 2800 DR 5000 LASA 30 LASA 50 LASA 100 XION CADAS 200 POCKET DR 820 DR 850 DR 890 DR 2400/2500 DR 4000 HAZARD CODE*											ART. NO.								
NITRITE																						
LCK	0.0015 – 0.03 mg/l NO ₂ -N 0.005 – 0.1 mg/l NO ₂	Diazotization	●	●	●			●	●	●												LCK541
AV	0.002 – 0.300 mg/l NO ₂ -N	Diazotization	●	●																	Xi	2512025
LCK	0.6 – 6 mg/l NO ₂ -N 2 – 20 mg/l NO ₂	Diazotization	●	●	●	●	●	●	●												Xi	LCK342
LCK	0.015 – 0.6 mg/l NO ₂ -N 0.05 – 2 mg/l NO ₂	Diazotization	●	●	●	●	●	●	●												Xi	LCK341
PP	0.002 – 0.300 mg/l NO ₂ -N	Diazotization	●	●																	Xi	2107169
PP	2 – 250 mg/l NO ₂ -N	Iron (II) sulphate	●	●																	Xi	2107569
TNT	0.003 – 0.500 mg/l NO ₂ -N	Diazotization																			Xi	2608345
NITROGEN (total), LATON																						
LCK	1 – 16 mg/l TN _b	Koroleff digestion + 2.6 dimethylphenol	●	●	●	●	●	●	●												C	LCK138
LCK	5 – 40 mg/l TN _b	Koroleff digestion + 2.6 dimethylphenol	●	●	●	●	●	●	●												C	LCK238
LCK	20 – 100 mg/l TN _b	Koroleff digestion + 2.6 dimethylphenol	●	●	●	●	●	●	●												C	LCK338
NITROGEN (total)																						
TNT	0.5 – 25.0 mg/l N	Persulphate digestion + chromotropic acid																			C, O	2672245
TNT	10 – 150 mg/l N	Persulphate digestion + chromotropic acid																			C, O	2714100
NITROGEN (total), Kjeldahl																						
PP	1 – 150 mg/l	Nessler	●	●																	T+, N, C	2495300
NITROGEN (total), inorganic																						
TNT	0.2 – 25.0 mg/l N	Titanium trichloride reduction																			C, Xn	2604545
ORGANIC ACIDS																						
RS	27 – 2,800 mg/l	Esterification	●	●																		2244700
ORGANIC ACIDS (fatty acids)																						
LCK	50 – 2,500 mg/l acetic acid	Esterification	●	●	●	●	●	●	●												Xn, Xi	LCK365
OXYGEN BINDER																						
PP	5 – 600 µg/l DEHA	Iron reduction	●	●																	C	2446600
OXYGEN (dissolved)																						
AV	0.3 – 15.0 mg/l	HRDO	●	●																	Xi	2515025
AV	1.0 – 40.0 mg/l	SHRDO (UHR)	●	●																	Xi	2515025
AV	6 – 800 µg/l	Indigo carmine	●	●																		2501025

1) Not measurable on DR 2400

Please note: the measuring ranges can vary from instrument to instrument!

→ *Hazard symbol with description see page 60

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Photometric tests (5)

TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
OZONE																	
AV	0.01 – 0.25 mg/l	Indigo	●	●						●	●	●	●	●	Xn		2516025
AV	0.01 – 0.75 mg/l	Indigo	●	●						●	●	●	●	●	Xn		2517025
AV	0.01 – 1.50 mg/l	Indigo	●	●							●	●	●	●	Xn		2518025
PCB																	
IM	Threshold values (ppm)	Immunoassay for soil and water	●	●					●			●	●	●	T, F		2773500
pH																	
RS	6.5 – 8.5 units	Phenol red							●	●	●	●					2657512
PHENOL																	
LCK	0.05 – 5 mg/l	4-aminoantipyrine	●	●	●	●	●	●							Xn		LCK345
LCK	5 – 200 mg/l	4-aminoantipyrine	●	●	●	●	●	●							Xn, O		LCK346
PP	0.002 – 0.200 mg/l	4-aminoantipyrine	●	●									●	●	Xi, Xn		2243900
PHOSPHONATE																	
PP	0.02 – 2.50 mg/l 1.0 – 125.0 mg/l	Persulphate/UV oxidation	●	●							●	●	●	●	Xi, Xn, O		2429700
PHOSPHORUS (ortho)																	
AV	0.02 – 2.50 mg/l PO ₄	PhosVer 3	●	●					●		●	●	●	●	Xi		2508025
AV	0.3 – 45.0 mg/l PO ₄	Molybdovanadate	●	●								●	●	●	C		2525025
PP	0.02 – 2.50 mg/l PO ₄	PhosVer 3	●	●					●		●	●	●	●	Xi		2106069
RL	0.3 – 45.0 mg/l PO ₄	Molybdovanadate	●	●									●	●	C		2076049
RL	19 – 3,000 µg/l PO ₄ 0.04 – 30.00 mg/l PO ₄	Ascorbic acid Amino acid	●	●						●	●	●	●	●	C T, C		2678600 2244100
RS	0.3 – 45.0 mg/l PO ₄	Molybdovanadate	●	●								●	●	●	C		2076032
TNT	0.06 – 5.00 mg/l PO ₄	PhosVer 3									●	●	●	●	C		2742545
TNT	1.0 – 100.0 mg/l PO ₄	Molybdovanadate											●	●	Xi		2767345
LCK	1.6 – 30 mg/l PO ₄ -P 5 – 90 mg/l PO ₄	Vanadate-molybdate	●	●	●	●	●	●							C		LCK049
PHOSPHORUS (ortho + total)																	
LCK	0.01 – 0.5 mg/l PO ₄ -P 0.03 – 1.5 mg/l PO ₄	Phosphormolybdenum blue	●	●	●	●	●	●							C, Xn		LCS349
LCK	0.5 – 5 mg/l PO ₄ -P 5 – 15 mg/l PO ₄	Phosphormolybdenum blue	●	●	●	●	●	●							C, Xn		LCK348
LCK	2 – 20 mg/l PO ₄ -P 6 – 60 mg/l PO ₄	Phosphormolybdenum blue	●	●	●	●	●	●							C, Xn		LCK350
TNT	0.06 – 5.00 mg/l PO ₄	PhosVer 3 with acid hydrolysis									●	●	●	●	C, O, Xn		2742745
LCK	0.05 – 1.5 mg/l PO ₄ -P 0.15 – 4.5 mg/l PO ₄	Phosphormolybdenum blue	●	●	●	●	●	●							C, Xn		LCK349

LCK	→ LANGE cuvette test	HPT	→ HACH pipette test	RS	→ Reagent solution
LCW	→ LANGE pipette test	PP	→ Powder Pillow test	IM	→ Immunoassay
TNT	→ TEST'N'TUBE	AV	→ ACCUVAC	RL	→ Rapid liquid system

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



Cuvette Test (LCK)



Powder Pillow (PP)



ACCUVAC (AV)

- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

TYPE	MEASURING RANGE	METHOD	DR 2800 DR 5000 LASA 30 LASA 50 LASA 100 XION CADAS 200 POCKET DR 820 DR 850 DR 890 DR 2400/2500 DR 4000 HAZARD CODE*											ART. NO.						
PHOSPHORUS (total)																				
TNT	0.06 – 3.50 mg/l PO ₄	PhosVer 3 with acid-persulphate digestion												●	●	●	●	C, Xn, O	2742645	
TNT	1.0 – 100.0 mg/l PO ₄	Molybdovanadate with acid-persulphate digestion															●	●	C, Xn, O	2767245
PHOTOMETRIC IODINE SAMPLE																				
LCK	Iodine value > 0,2	MEBAK	●	●														F	LCK240	
POTASSIUM																				
LCK	8 – 50 mg/l	Kalignost	●	●	●	●	●	●											LCK328	
PP	0.1 – 7.0 mg/l	Tetraphenylborate	●	●													●	●	T, F	2459100
REDUCING AGENT for boiler water																				
LCW	0.02 – 1 mg/l DEHA	LANGE method	●	●	●			●	●	●								C	LCW250	
SELENIUM																				
RS	0.01 – 1.00 mg/l	Diaminobenzidine	●	●													●	●	C, F, Xn	2244200
SILICIA																				
LCW	0.01 – 0.8 mg/l SiO ₂ 0.005 – 0.4 mg/l Si	Molybdenum blue	●	●	●			●	●	●									Xn, Xi	LCW028
LCW	0.8 – 100 mg/l SiO ₂ 0.4 – 50 mg/l Si	Molybdenum blue	●	●	●			●	●	●									Xn, Xi	LCS028
PP	0.01 – 1.60 mg/l SiO ₂	Heteropoly blue	●	●										●	●	●	●	●	Xi, Xn	2459300
PP	1.0 – 100.0 mg/l	Silicomolybdate	●	●							●				●	●	●	●	Xi	2429600
PP	3 – 1,000 µg/l SiO ₂	Heteropoly blue	●	●													●	●	Xi	2553500
PP	3 – 1,000 µg/l SiO ₂	Heteropoly blue	●	●													●	●	Xi, Xn	2678500
SILVER																				
LCK	0.04 – 0.8 mg/l	LANGE method	●	●	●	●	●	●	●										F	LCK354
LCK	5 – 2,500 mg/l	LANGE method	●	●	●	●	●	●	●										C	LCK355
PP	0.005 – 0.700 mg/l	Colorimetric	●	●													●	●	Xi	2296600
SLUDGE ACTIVITY																				
LCK		TTC test	●	●	●			●	●	●									F	LCK318
STARCH																				
LCK	2 – 150 mg/l	Iodine	●	●	●			●	●	●										LCK357
SULPHATE																				
LCK	40 – 150 mg/l	Barium sulphate	●	●	●	●	●	●	●										T	LCK153
AV	2 – 70 mg/l	Turbidity measurement	●	●									●	●	●	●	●	●	Xn	2509025
LCK	150 – 900 mg/l	Barium sulphate	●	●	●	●	●	●	●										T	LCK353
PP	2 – 70 mg/l	Barium sulphate	●	●													●	●	Xn	1206599
PP	2 – 70 mg/l	Turbidity measurement	●	●									●	●	●	●	●	●	Xn	2106769

1) Not measurable on DR 2400

Please note: the measuring ranges can vary from instrument to instrument!

→ *Hazard symbol with description see page 60

Photometric tests (6)

TYPE	MEASURING RANGE	METHOD													HAZARD CODE*	ART. NO.	
			DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500			DR 4000
SULPHIDE																	
LCK	0.1 – 2 mg/l	Dimethylphenylendiamine	●	●	●	●	●	●	●							C	LCK653
RS	5 – 800 µg/l	Methylene blue	●	●						●	●	●	●		T, C	2244500	
LCW	0.1 – 2 mg/l	Dimethylphenylendiamine	●	●	●		●	●	●						C	LCW053	
SULPHITE																	
LCW	0.1 – 5 mg/l	LANGE method	●	●	●		●	●	●							LCW054	
HPT	0.1 – 5,0 mg/l	HACH method	●	●								●			C	HPT430	
SURFACTANTS (anionic)																	
LCK	0.2 – 2 mg/l	MBA	●	●	●	●	●	●	●						Xn	LCK332	
RS	0.002 – 0.275 mg/l LAS	Crystal violet	●	●						●	●	●	●		F, T	2446800	
SURFACTANTS (cationic)																	
LCK	0.2 – 2 mg/l	CTAB	●	●	●	●	●	●	●						F, Xn	LCK331	
SURFACTANTS (nonionic)																	
LCK	0.2 – 6.0 mg/l	TBPK, CTAS	●	●	●	●	●	●	●						Xn	LCK333	
LCK	0.1 – 20 g/l	TBPK, CTAS	●	●	●		●	●	●						Xn	LCK334	
LCK	6 – 200 mg/l	TBPK, CTAS	●	●	●	●	●	●	●						Xn	LCK433	
SUSPENDED SOLIDS																	
	0 – 750 mg/l	Photometric	●	●						●	●	●					
TANNIN + LIGNIN																	
RS	0.1 – 9.0 mg/l	Tyrosine	●	●						●	●	●	●			2244600	
TIN																	
LCK	0.1 – 2 mg/l	Pyridinfluoron (PYF)	●	●	●	●	●	●	●						T, O	LCK359	
TOC (difference method)																	
LCK	2 – 65 mg/l TOC	Persulphate (photometric)	●	●	●	●	●	●	●						Xn, O	LCK380	
LCK	60 – 735 mg/l TOC	Persulphate (photometric)	●	●	●	●	●	●	●						Xn, O	LCK381	
TOC (expulsion method)																	
LCK	3 – 30 mg/l TOC	Persulphate (photometric)	●	●											Xn	LCK385	
LCK	30 – 300 mg/l TOC	Persulphate (photometric)	●	●											Xn	LCK386	
LCK	300 – 3,000 mg/l TOC	Persulphate (photometric)	●	●											Xn, N	LCK387	
TNT	0.3 – 20.0 mg/l C	Persulphate (photometric)								●	●	●	●		Xn, O	2760345	
TNT	15 – 150 mg/l C	Persulphate (photometric)								●	●	●	●		Xn, O	2815945	
TNT	100 – 700 mg/l C	Persulphate (photometric)								●	●	●	●		Xn, O	2760445	
TOLYLTRIAZOLE																	
PP	1 – 20 mg/l	UV photolysis	●	●							●	●	●		Xn	2141299	
TOXICITY																	
PP	0 – 100 % inhibition	ToxTrak	●	●	●		●	●	●						C	2597200	

LCK	→	LANGE cuvette test	HPT	→	HACH pipette test	RS	→	Reagent solution
LCW	→	LANGE pipette test	PP	→	Powder Pillow test	IM	→	Immunoassay
TNT	→	TEST'N'TUBE	AV	→	ACCUVAC	RL	→	Rapid liquid system

→ Laboratory automation: see Chapter 9 → Samplers: see Chapter 10 → Process measurement technology: see Chapter 11-20



Cuvette Test (LCK)



Powder Pillow (PP)



ACCUVAC (AV)

- Photometers and spectrophotometers see. page 29
- Lab. analysers see page 83

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TYPE	MEASURING RANGE	METHOD	DR 2800	DR 5000	LASA 30	LASA 50	LASA 100	XION	CADAS 200	POCKET	DR 820	DR 850	DR 890	DR 2400/2500	DR 4000	HAZARD CODE*	ART. NO.
TPH in water																	
IM	Limiting value 2 – 200 mg/l	Immunoassay for soil and water	●	●	●	●	●	●	●	●		●	●	●			2774300
TRIALOMETHANE																	
RS	0 – 200 ppb	THM Plus	●	●											●		2790800
VICINAL DIKETONES																	
LCK	0.015 – 0.5 mg/kg diacetyl	MEBAK	●	●					●							T, N	LCK242
ZINC																	
LCK	0.2 – 6 mg/l	PAR	●	●	●		●	●	●							Xn	LCK360
PP	0.01 – 2.00 mg/l	Zincon	●	●						●		●	●	●	●	Xn, N	2429300
ZINC (trace)																	
LCK	0.02 – 0.8 mg/l	PAR	●	●	●		●	●	●							Xn	LCS360

5

Standard solutions – Analytical Quality Assurance

Analysis is not just about measured values. E.g. results are only dependable in conjunction with analytical quality assurance (AQA). HACH LANGE offers classic single standard solutions as well as practical multi-standard solutions. The comprehensive ADDISTA AQA system for LANGE cuvette tests contains two round robin solutions, which allow the user to participate in analysis checking free of charge.



ADDISTA contains a combined standard and spiking solution as well as two round robin solutions. For several parameters simultaneously, each ADDISTA provides seamless quality assurance for the LANGE cuvette analysis system. Other benefits include:

- Internal checking of method and equipment
- Detection of sample related interferences
- External confirmation through a round robin test. This will be checked against HACH LANGE standards and if successful you will be presented with a certificate. Free of charge!

ADDISTA multistandard solutions for analytical quality assurance of LANGE cuvette tests

FOR CUVETTE TEST		CONCENTRATION	ART. NO.	FOR CUVETTE TEST		CONCENTRATION	ART. NO.
Ammonium	LCK304	0.015 – 2 mg/l NH ₄ -N	LCA700	Ammonium	LCK305	1 – 12 mg/l NH ₄ -N	LCA704
Chloride	LCK311	1 – 70 mg/l		Chloride	LCK311	1 – 70 mg/l	
COD	LCK414	5 – 60 mg/l		COD	LCK314	15 – 150 mg/l	
Nitrogen (total)	LCK238	5 – 40 mg/l TN _b		COD ISO	LCK500	0 – 150 mg/l	
Phosphorus (ortho)	LCK348	0.5 – 5 mg/l PO ₄ -P		Nitrate	LCK340	5 – 35 mg/l NO ₃ -N	
Potassium	LCK328	8 – 50 mg/l		Phosphorus (ortho)	LCK349	0.05 – 1.5 mg/l PO ₄ -P	
Copper	LCK329	0.1 – 8 mg/l	LCA701	Sulphate	LCK153	40 – 150 mg/l	
Iron	LCK321	0.2 – 6 mg/l		TOC	LCK385	3 – 30 mg/l	
Lead	LCK306	0.1 – 2 mg/l		Ammonium	LCK302	47 – 130 mg/l NH ₄ -N	LCA705
Nickel	LCK337	0.1 – 6 mg/l		Chloride	LCK311	1 – 70 mg/l	
Sulphate	LCK353	150 – 900 mg/l		COD	LCK014	1,000 – 10,000 mg/l	
Zinc	LCK360	0.2 – 6 mg/l		TOC	LCK387	300 – 3,000 mg/l	
Aluminium	LCK301	0.02 – 0.5 mg/l	LCA702	Copper	LCK529	0.01 – 1 mg/l	LCA706
Cadmium	LCK308	0.2 – 0.3 mg/l		Iron	LCK521	0.01 – 1 mg/l	
Chromium (VI)	LCK313	0.03 – 1 mg/l		Manganese	LCW032	0.02 – 5 mg/l	
Chromium (total)	LCK313	0.03 – 1 mg/l		Nickel	LCK537	0.05 – 1 mg/l	
Sulphate	LCK353	150 – 900 mg/l		COD	LCK614	50 – 300 mg/l	LCA707
Ammonium	LCK303	2 – 47 mg/l NH ₄ -N	LCA703	Nitrite	LCK341	0.015 – 0.6 mg/l NO ₂ -N	
Chloride	LCK311	1 – 70 mg/l		Phosphorus (total)	LCK348	0.5 – 5 mg/l PO ₄ -P	
COD	LCK114	150 – 1,000 mg/l		COD	LCK514	100 – 2,000 mg/l	LCA708
COD ISO	LCK400	0 – 1,000 mg/l		Nitrogen (total)	LCK338	20 – 100 mg/l TN _b	
Nitrate	LCK339	0.23 – 13.5 mg/l NO ₃ -N		Phosphorus (total)	LCK350	2 – 20 mg/l PO ₄ -P	
Phosphorus (ortho)	LCK049	1.6 – 30 mg/l PO ₄ -P		COD	LCK614	50 – 300 mg/l	LCA709
Phosphorus (ortho)	LCK350	2 – 20 mg/l PO ₄ -P		Nitrogen (total)	LCK138	1 – 16 mg/l TN _b	
Sulphate	LCK353	150 – 900 mg/l		Nitrite	LCK342	0.6 – 6 mg/l NO ₂ -N	
TOC	LCK386	30 – 300 mg/l		Phosphorus (total)	LCK349	0.05 – 1.5 mg/l PO ₄ -P	

All ADDISTAs contain 85 ml standard and spiking solution as well as two round robin test solutions, 25 ml each

- More information on LANGE cuvette tests and ADDISTA: see page 44
- All LANGE cuvette tests: see page 54
- For more information about ordering on the Internet see page 146

LANGE single standard solutions

FOR CUVETTE TEST		DETERMINATION	ART. NO.
AOX	LCK390	6	LCA390
BOD ₅	LCK555	10	LCA555
Chlorine	LCK310	20	LCA310

HACH multistandard solutions at a glance

APPLICATION	PARAMETER	CONCENTRATION	ART. NO.
Heavy metals in drinking water, low measuring range	Copper	1 mg/l Cu	2833749
	Iron	0.3 mg/l Fe	
	Manganese	0.1 mg/l Mn	
Heavy metals in drinking water, high measuring range	Copper	2.5 mg/l Cu	2833649
	Iron	1.5 mg/l Fe	
	Manganese	5 mg/l Mn	
Inorganic substances in drinking water	Fluoride	1 mg/l F	2833049
	Nitrate	2 mg/l NO ₃ -N 8.9 mg/l NO ₃	
	Phosphate Sulphate	2 mg/l PO ₄ 50 mg/l SO ₄	
Water hardness, low measuring range	Calcium	50 mg/l CaCO ₃	2833449
	hardness	2.8 °dH	
	Total hardness	100 mg/l CaCO ₃ 5.6 °dH	
Water hardness, high measuring range	Calcium	500 mg/l CaCO ₃	2833349
	hardness	28.1 °dH	
	Total hardness	1,000 mg/l CaCO ₃ 56.2 °dH	

APPLICATION	PARAMETER	CONCENTRATION	ART. NO.
Wastewater, inflow	Ammonium	15 mg/l NH ₄ -N	2833149
	COD	500 mg/l COD	
	Nitrate	10 mg/l NO ₃ -N	
	Phosphate	10 mg/l PO ₄ 3.3 mg/l PO ₄ -P	
Wastewater, outflow	Sulphate	400 mg/l SO ₄	2833249
	TOC	161 mg/l TOC	
	Ammonium	2 mg/l NH ₄ -N	
	COD	25 mg/l COD	
	Nitrate	4 mg/l NO ₃ -N	
	Phosphate	2 mg/l PO ₄ 0.65 mg/l PO ₄ -P	
	Sulphate	50 mg/l SO ₄	
	TOC	8 mg/l TOC	

All HACH multistandards come in 500 ml bottles

HACH single standard solutions—a selection

PARAMETER	CONC.	VOLUME	ART. NO.
Aluminium as Al*	100 mg/l	100 ml	1417442
Ammonium as NH ₃ -N	1 mg/l	500 ml	189149
	10 mg/l	500 ml	15349
Arsenic** as As	1,000 mg/l	100 ml	1457142
Barium as Ba*	1,000 mg/l	100 ml	1461142
BOD ₅ *	300 mg/l	10 ml/16 A*	1486510
	glucose/ glutamic acid 3,000 mg/l glucose/ glutamic acid	10 ml/16 A*	1486610
Cadmium as Cd*	100 mg/l	100 ml	1402442
Calcium as Ca* for hardness	10 mg/l	100 ml	2305442
Calcium* as CaCO ₃ (CaCl ₂) for hardness	1,000 mg/l	1 l	12153
Chloride as Cl	1,000 mg/l	500 ml	18349
Chlorine as Cl ₂ *	25–30 mg/l	2 ml/20 A*	2630020
	50–75 mg/l	10 ml/16 A*	1426810
Chromium (III) as Cr ³⁺ *	50 mg/l	100 ml	1415142
Chromium (VI) as Cr ⁶⁺ *	12.5 mg/l	10 ml/16 A*	1425610
Cobalt as Co*	1,000 mg/l	100 ml	2150342
	300 mg/l	200 ml	1218629
	300 mg/l	500 ml	1218649
COD*	300 mg/l	200 ml	2253929
	1,000 mg/l	200 ml	

PARAMETER	CONC.	VOLUME	ART. NO.
Copper as Cu*	100 mg/l	100 ml	12842
Fluoride as F*	1.0 mg/l	1 l	29153
Hardness as CaCO ₃ *	10,000 mg/l	10 ml/16 a*	218710
Iron as Fe*	100 mg/l	100 ml	1417542
Lead as Pb*	50 mg/l	10 ml/16 A*	1426210
Manganese as Mn*	1,000 mg/l	100 ml	1279142
Mercury*** as Hg*	1,000 mg/l	100 ml	1419542
Molybdenum as Mo*	500 mg/l	10 ml/16 a*	1426510
Nickel as Ni*	1,000 mg/l	100 ml	1417642
Nitrate as NO ₃ -N*	10 mg/l	500 ml	30749
Nitrite solution, stock as N, APHA	250 µg/l	500 ml	2340249
Phosphate as PO ₄ ³⁻ *	1 mg/l	500 ml	256949
Phosphorus as P*	25 mg/l	10 ml/16 a*	2109210
Potassium as K*	100 mg/l	1,000 ml	2240442
Silica as SiO ₂ *	1 mg/l	500 ml	110649
Silver as Ag*	1,000 mg/l	100 ml	1461342
Sulphate as SO ₄ ²⁻ *	50 mg/l	500 ml	257849
	1,000 mg/l	500 ml	2175749
Sulphite as SO ₃ ²⁻ *	5,000 mg/l	10 ml/16 a*	2267410
Zinc as Zn*	100 mg/l	100 ml	237842

) NIST standardised reference material a) Ampules; **) Hazardous substance T; 2 ***) Hazardous substance Xn; 3

Other concentrations of HACH single standard solutions available on request

→ More information on the HACH tests: see page 41

→ All HACH tests: see pages 46, 54

→ For more information about ordering on the Internet see page 146

BOD TRAK—simple manometric determination of BOD

- Simple handling without costly dilution series
- Manometric method with no mercury loading
- Time savings
- Versatile measurement programme for 5, 7, 10 or 30 days



The BOD TRAK measuring station is stirrer, meter and evaluation unit in one

BOD TRAK—the comprehensive measuring station

Just add a measured amount of sample and a measured amount of nutrient into the bottles, connect the pressure sensors, and leave the rest to the BOD TRAK. The progress of the test over 5, 7, 10 or 30 days can be checked at any time, as measurement curves and data can be called up during the incubation.

Measure BOD manometrically

The measurement principle is simple. When bacteria break down substances contained in the sample, they consume O₂ and produce CO₂. The O₂ consumption causes the pressure in the bottles to drop, as the generated equivalent amount of CO₂ is removed by absorption in LiOH. BOD TRAK calculates the BOD value (in mg/l) from the measured pressure.

Cost effective BOD Measuring

The conventional route to BOD is very time consuming, requiring a dilution series to be prepared, oxygen to be determined, this is costly. None of this is necessary when BOD is determined by the manometric method, which can be carried out very easily.

BOD TRAK, Art. no. 2619700

Type	Manometric BOD _n laboratory measurement station, control unit and stirrer with pressure sensors for 6 bottles
Methods	BOD measurement programmes for 5, 7, 10 days, OECD biodegradation test for 30 days
Measuring range	0-700 mg/l, variable
Display	For graphic representation of the BOD measurement curve
Data storage	For the measured values
Equipment	6 rubber sleeve stoppers, 6 473-ml brown glass bottles, grease, 6 magnetic stirrers, funnel, 1 pkg LiOH Powder Pillows, 1 pkg nutrient Powder Pillows
Interface	232C for documentation on printer or PC
Power supply	0/230 V, 50/60 Hz
Dimensions, weight	30.5 x 30.5 x 12.7 cm; 7.85 kg

Accessories for BOD TRAK

ART. NO.	DESCRIPTION
714421	6 473-ml brown glass bottles
1097752	Rubber sleeve stopper
1076416	Magnetic stirrer bar
2616202	BOD incubator, 20 °C, inside dimensions 42 x 44.5 x 61 cm

→ BOD cuvette test: see page 54

Fast and reliable detection of micro-organisms

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Micro-organisms are a risk factor in many areas of life. They harm health and can disrupt industrial processes, which costs time and money. Fast and reliable detection of micro-organisms is a prerequisite for process control, effective cost reduction and compliance with legal threshold values. Rapid identification of micro-organisms allows early detection and action can be taken.

Globally proven methods give reliable results

Microbiological methods from HACH LANGE are based on globally accepted procedures. Their effectiveness has been demonstrated all over the world for many years. Many products conform to official standard methods or are approved for legal control measurements.

Time and cost savings

From sampling to the evaluation of the results, HACH LANGE methods are well designed. Where possible, the reagent holder also serves as the test vessel, thus saving time, space and costs. Reagents are in liquid form and can therefore be added and mixed dustfree.

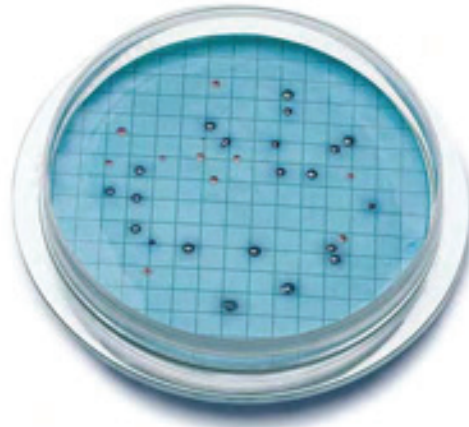
Long shelf life and ready for use immediately

All reagents and individual tests are ready to use—even sterile consumables can be used immediately. A long shelf life gives maximum flexibility. All procedures, whether membrane filtration, P/A, MPN or paddle tester, can be carried out simply, quickly, and safely.



Fast detection of micro-organisms – for clean drinking and recreational water

- Tests and nutrient media
- Coliforms and *E. coli* detection in only 24 hours
- Total bacteria count
- *Pseudomonas aeruginosa*



Ready-to-use membrane filtration with M COLI BLUE24: reliable detection of *E. coli* and coliforms in only 24 hours!



Simplified membrane filtration; reliable and fast

E. coli or coliforms? With M COLI BLUE24, HACH LANGE has considerably improved membrane filtration.

- Simple handling with pre-portioned selective medium and petri dish complete with filter
- Fast results: In only 24 hours

P/A, the simple alternative

Faecal contamination? Reliable detection is very simple: just add 100 ml water to the selected liquid reagent in the sterile vessel. After the incubation period, a change of colour from red to yellow clearly will indicate the presence of a single coliform; fluorescence indicates the presence of *E. coli*.

MPN for recreational water and as a confirmation test

Benefits:

- Standard media
- With Durham tubes, if needed
- Pre-dosed for immediate use
- Flexible use: individual or with 15 tubes for a 3 x 5 MPN test

Overview of the most important tests and nutrient media

MEMBRANE FILTRATION	
M COLI BLUE24	Detection of coliforms (red) and <i>E. coli</i> (blue) on filter in 24 h; EPA-approved
m-Endo	Classic coliform detection
m-FC	Classic faecal coliform detection
m-TGE with TTC	Determination of total bacteria count (heterotrophic bacteria)
m-HPC	Determination of total bacteria count (heterotrophic bacteria)
<i>Pseudomonas</i> Broth	Detection of <i>Pseudomonas spec.</i>
P/A (PRESENCE/ABSENCE)	
Broth	Presence or absence of coliforms
Broth with MUG	Presence or absence of coliforms and <i>E. coli</i>
MPN (MOST PROBABLE NUMBER)	
Lauryl Tryptose	Detection of coliforms
- With MUG	Detection of coliforms and <i>E. coli</i>
Brilliant green bile	Confirmation test for coliforms
Lactose broth	Detection of coliforms
EC medium	Confirmation test for faecal coliforms
- With MUG	Confirmation test for <i>E. coli</i>

Reliable and accurate monitoring of bacteria and fungi

DW

PW

- Slime formation
- Corrosion
- Odour
- Discolouration



Paddle testers for reliable detection

Cleaning and disinfection measures cost money and must be checked. The ready-to-use paddle testers make bacteria, yeasts and moulds on surfaces or in liquids visible. Simply immerse the paddle or press it onto the surface, incubate and count.

BART testers get the right result

Clogged filters, corroded pipes, odours? Bacteria are usually to blame. But which bacteria? BART testers clearly identify the main culprits. Simply add the sample to the reagent in the vessel, incubate, and evaluate the result.

Cost savings

Paddle and BART testers indicate the presence of bacteria. They also indicate how many of them are present or their activity. This means that individual limiting values can be specifically monitored, making processes safer and saving costs.

Dip the paddle or press it onto the surface, incubate, count, finish!

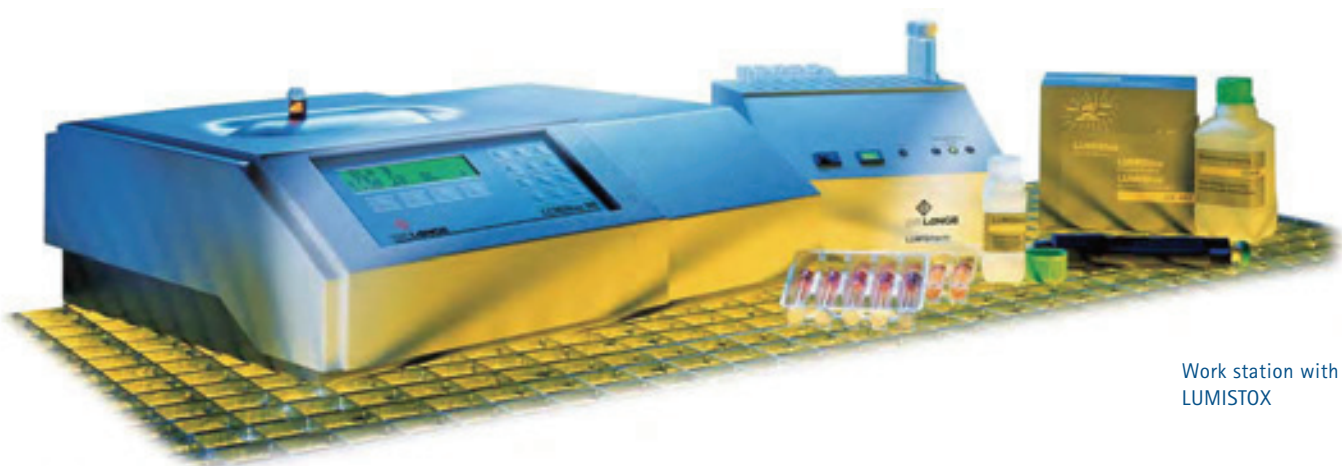
Overview of the tests

DESCRIPTION	QTY.	ART. NO.
PADDLE TESTERS		
Total bacteria, yeast and mould	10/pkg	2610810
Total bacteria and coliforms	10/pkg	2610910
Total bacteria and disinfection control	10/pkg	2619510
BART TESTERS		
Iron-related bacteria	9/pkg	2432309
	27/pkg	2432327
Sulphate-reducing bacteria	9/pkg	2432409
	27/pkg	2432427
Slime-forming bacteria	9/pkg	2432509
	27/pkg	2432527
Combined package: sulphate-reducing, slime-forming, iron-related bacteria	each 3/pkg	2434809
Denitrifying bacteria	9/pkg	2619309
Nitrifying bacteria	7/pkg	2619407
Fluorescing pseudomonas	9/pkg	2432609
	27/pkg	2432627
Heterotrophic aerobic bacteria (total bacteria count)	9/pkg	2490409
	27/pkg	2490427
Acid-producing bacteria	9/pkg	2831409
Micro-algae	9/pkg	2432709
	27/pkg	2432727

WW
PW

LUMISTOX luminescent bacteria test: Toxicity detection in minutes

- **Conforms to international EN ISO 11348 standard**
- **Long-life preserved bacteria**
- **Simple operation**
- **Quick results: max. test time of 30 minutes**
- **Effortless compensation for interferences**



Work station with
LUMISTOX

Safe and reliable

Does the toxicity of wastewater or environmental samples exceed defined limiting values? Do chemicals or process wastewater samples have to be subjected to a risk assessment? Round robins consistently confirm that the luminescent bacteria test is the most reliable and safest biotest.

Simple and fast

The luminescent bacteria test is as simple to carry out as a chemical analysis. The preserved luminescent bacteria are reactivated before the test is started. Their viability is indicated by their natural luminescence; the more the sample inhibits this luminescence, the more toxic it is. The result is available within 30 minutes.

For official monitoring and day to day analysis

The LUMISTOX measuring system is available for a variety of requirements:

- For standardised luminescent bacteria tests and all other demanding tasks concerning toxicity
- For cost-effective operational analysis

LUMISTOX and accessories

DESCRIPTION	ART. NO.	DESCRIPTION	ART. NO.
LUMISTOX 300 Luminometer to EN ISO 11348	LPV321	Liquid-dried luminescent bacteria to EN ISO 11348 part 2	200 tests LCK480 400 tests LCK482 90 tests LCK487
LUMISTHERM Thermostat 15 °C to EN ISO 11348	LTV053	Freeze-dried luminescent bacteria to EN ISO 11348 part 3	1,200 tests LCK491
LUMISSOFT 4 Computer software with extensive test and sample documentation	LZV093	LUMIS glass cuvettes, pkg/638 for the luminescent bacteria test	LZP187
		NaCl solution, 250 ml, for the luminescent bacteria test	LCK 481



More at www.hach-lange.co.uk, www.hach-lange.com, keyword „LUMISTOX“, with free downloads of brochure (DOC032.52.00060) and User Manual (BDA318)

Turbidity measurement to ISO and EPA standards—in the laboratory and in the field

Turbidity is an easily obtainable, meaningful parameter, and is firmly established in water analysis, quality assurance and process control.

The 2100 series turbidimeters from HACH combine practical design with standard-compliant measurement technology. All instruments are available with the option of an infrared or a white light source in line with ISO or EPA.

Precise and reliable

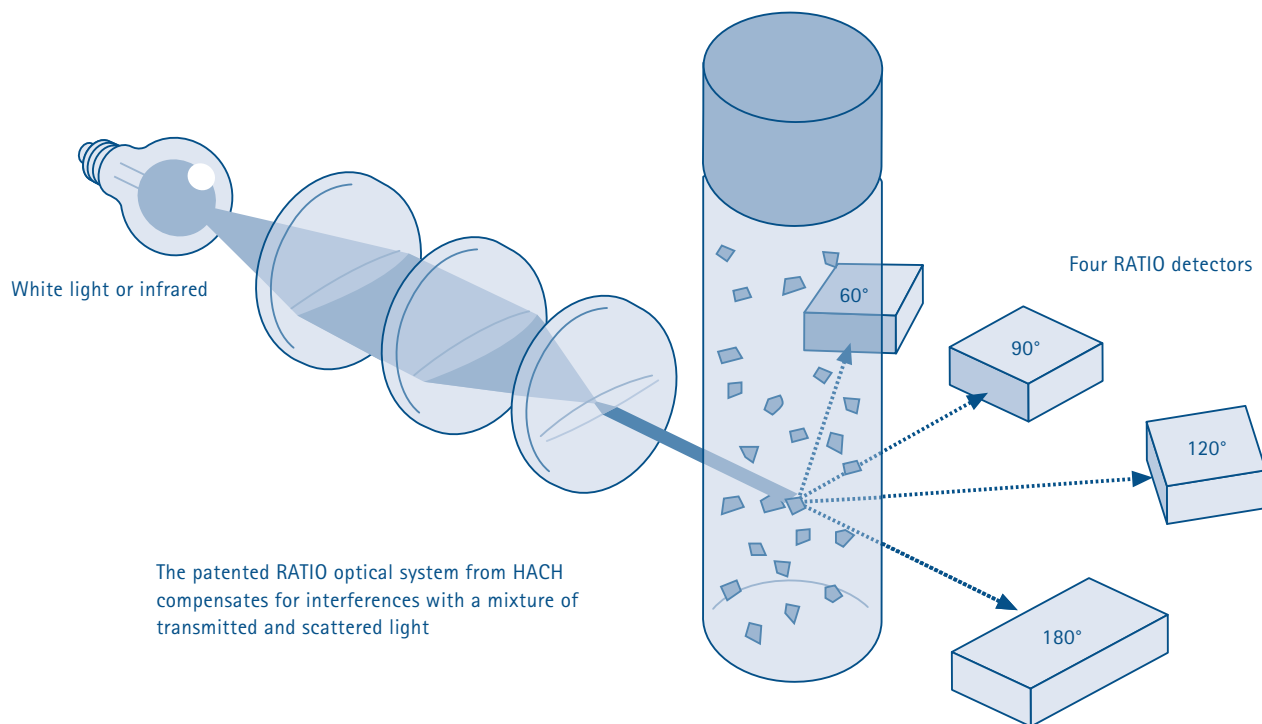
- In detecting the slightest turbidity e.g. in drinking water
- In the treatment of wastewater and process water
- In the monitoring of municipal and industrial filtration processes
- In the monitoring of process water streams
- For quality assurance

Simple calibration with STABL CAL

Turbidimeters are tested and calibrated with formazin suspensions. Reliable turbidity measurement requires the preparation of a formazin standard solution, as prescribed by EN ISO 7027 for instrument calibration. With its STABL CAL range, HACH is the world's only supplier of stabilised, directly usable, formazin primary standards in different concentrations. Comes with an analysis certificate!

RATIO optical system compensates for interferences

The RATIO optical system in all 2100 series turbidimeters detects and compensates for interference factors such as the intrinsic colour of the sample or fluctuations in the lamp output. The measured value is determined from several signals. In practice, this means outstanding accuracy and sensitivity over the total measuring range – also at ultrahigh levels of turbidity!



Wide turbidity measurements in the laboratory

- With infrared or white light in line with ISO and EPA
- Wide measuring range thanks to **RATIO** optical system: 0.001–10,000 NTU
- Simple calibration
- Intuitive operation
- For opalescence in line with Pharm. Eur. 5.0



2100AN/AN IS
Turbidimeter with integrated printer

2100N/2100N IS—the N series for standard applications

- 3-detector RATIO optical system to compensate for interferences
- Automatic measuring range switching

2100AN/2100AN IS—the AN series for professional tasks

- 4-detector RATIO optical system to compensate for interferences
- Wide measuring range up to 10,000 NTU

Complete package for turbidity measurement

- Maintenance contract complete with extended guarantee for test equipment monitoring
- Equipment qualification (EQ)
- Adapter for small sample volumes

Technical data for 2100N/AN laboratory turbidimeters

MODEL	2100N	2100N IS	2100AN	2100AN IS
Art. no.	4700002	4790002	4700102	4790102
Light source	White light	Infrared 860 nm	White light	Infrared 860 nm
Standard	USEPA 180.1	EN ISO 7027	USEPA 180.1	EN ISO 7027
RATIO Mode	90°/120°/180°	90°	90°/60°/120°/180°	90°/60°/120°/180°
Measuring range	0.001 – 4,000 NTU 0.01 – 980 EBC	0.001 – 1,000 FNU	0.001 – 10,000 NTU 0.01 – 2,450 EBC	0.001 – 1,000 FNU 0.001 – 10,000 NTU
Resolution	0.001 in the range 0.001 – 0.999 FNU/NTU; 0.01 in the range 1.00 – 9.99 FNU/NTU 0.1 in the range 10.0 – 99.9 FNU/NTU; 1 in the range 100 – 1,000 FNU bzw. 10,000 NTU			
Accuracy	± 2 % in the range 0 – 1,000 NTU; ± 5 % in the range 1,000 – 4,000 NTU; ± 10 % in the range 4,000 – 10,000 NTU			
Reproducibility	± 1% or 0.01 FNU/NTU			
Signal averaging	Can be switched on or off			
Calibration	Up to 5 points	Up to 5 points	Up to 6 points, User method with up to 8 points	Up to 6 points, User method with factor
Response time	< 7 sec, 14 sec with signal averaging			
Sample volume	At least 20 ml			
Time/Date	Integrated real-time clock			
Interface	RS232C			
Integrated printer	No	No	Yes	Yes
Dimensions/Power requirements	40.0 x 30.5 x 14.2 cm (L x B x D); 150/230 V AC/50/60 Hz			

- For turbidity standards and accessories, see next page

Reliable and robust turbidimetry in the field

- Standard-compliant technology
- Precision due to RATIO optical system
- Simple to operate
- Reliable and robust
- Fully equipped for on-site operation



ISO with white light or infrared

In order to be able to compare turbidity values reliably, traceability to international standards is necessary. The 2100P ISO was designed to conform with EN ISO 7027 (860 nm IR LED). The 2100P model conforms completely to the guidelines of the USEPA 180.1.

Rough terrain and difficult samples – no problem

The RATIO optical system guarantees precise measurement results right across the measuring range – even when samples are turbid or ultraclear. The non-adjustable optical system is enclosed in high-impact ABS plastic, which protects the instruments perfectly, even in the most difficult surroundings.

Fully equipped in the field

The easy to use 2100P and 2100P ISO turbidimeters can be powered by mains or batteries, and are factory calibrated. In addition, the practical carrying case holds everything needed for transporting, calibrating and measuring in the field.

2100P portable turbidimeters

MODEL	2100P	2100P ISO
Art. no.	4650000	4474002
Light source	White light	Infrared (860 nm)
Standard	USEPA 180.1	EN ISO 7027
RATIO-Mode	90/180°	90/180°
Measuring range	0.01 – 1,000 NTU	0.01 – 1,000 FNU
Resolution	0.01 in the range from 0.01 – 9.99 0.1 in the range from 10.0 – 99.9 1 in the range from 100 – 1,000	
Accuracy	± 2 % of the reading plus scattered light	
Scattered light	< 0.02 FNU/NTU	
Reproducibility	± 1 % or 0.01 FNU/NTU	
Signal averaging	Can be switched on or off	
Calibration	4-point calibration, automatic	
Response time	6 sec	
Display	LCD	
Sample volume	At least 15 ml	
Dimensions	22.2 x 9.5 x 7.9 cm (L x W x D)	
Weight	0.45 kg (2.7 kg in case with accessories)	
Operating conditions	0 – 50 °C	



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "2100 Turbidity", with free downloads of brochure for 2100P ISO (DOC062.52.00620) and User Manuals for 2100P (DOC022.52.00641) and 2100P ISO (DOC022.52.00630)

STABL CAL standards and accessories for measuring turbidity

- Durable, stable standard suspensions in bottles or sealed vials
- Immediately ready for use; no dilution needed
- Preparation of a formazin stock solution is no longer necessary
- Opalescence conforms with Pharm. Eur. 5.0

Two simple methods:
Either insert the reusable vials directly into the instrument or use standard solution from bottles.



STABL CAL standards and accessories for measuring turbidity and opalescence

STABL CAL standards	ART. NO.
ready-to-use stabilised formazin primary standard; stable for 2 years after preparation	
Calibration kits for 2100AN/2100AN IS	
STABL CAL vial set: < 0.1; 20; 200; 1,000; 4,000; 7,500 NTU/FNU	2659505
STABL CAL 100 ml bottle set: < 0.1; 20; 200; 1,000; 4,000; 7,500 NTU/FNU	2659510
STABL CAL 500 ml bottle set: < 0.1; 20; 200; 1,000; 4,000; 7,500 NTU/FNU	2659500
Calibration kits for 2100N/2100N IS	
STABL CAL vial set: < 0.1; 20; 200; 1,000; 4,000 NTU/FNU	2662105
STABL CAL 100 ml bottle set: < 0.1; 20; 200; 1,000; 4,000 NTU/FNU	2662110
STABL CAL 500 ml bottle set: < 0.1; 20; 200; 1,000; 4,000 NTU/FNU	2662100
Calibration kits for 2100P/2100P ISO	
STABL CAL vial set: < 0.1; 20; 100; 800 NTU/FNU	2659405
STABL CAL 100 ml bottle set: < 0.1; 20; 100; 800 NTU/FNU	2659410
STABL CAL 500 ml bottle set: < 0.1; 20; 100; 800 NTU/FNU	2659400
STABL CAL standard kit for monitoring fine turbidities, including 4 100 ml bottles: 0.10; 0.30; 0.50; 1.00 NTU/FNU, Silicone oil, cuvette cleaning cloth, instructions; stable for at least 6 months	2714600
Set of reference suspensions I, II, III, IV with Pharm. Eur. 5.0, 2100AN/AN IS with certificate	
STABL CAL vial set: < 0.1; 3; 6; 18; 30 NTU/FNU	2897100
STABL CAL 100 ml bottle set: < 0.1; 3; 6; 18; 30 NTU/FNU	2897200
Stock suspension for measuring opalescence in conformity with Pharm. Eur. 5.0, 100 ml, 2100AN/AN IS	2896642
STABL CAL 100 ml bottle: 4,000 NTU/FNU	246142
STABL CAL 500 ml bottle: 4,000 NTU/FNU	246149
ACCESSORIES	
Round cuvettes 13 mm, pkg/494	LYY621
Stopper for LYY621 round cuvette, pkg/1	EYG044
Spare cuvettes with screw cap, pkg/6, for 2100AN/2100AN IS (also for visual methods in conformity with Pharm. Eur. 5.0)	2084900
Spare cuvettes with screw cap, pkg/6, for 2100P/2100P ISO	2434706
Flow-through cell set, manual, low pressure	4744900
Flow-through cell set, high pressure	4745100
Cuvette adapter for 12 to 13 mm round cuvettes	3033400
Cuvette adapter for 16 mm round cuvettes	3033500
Cuvette adapter for 19 mm round cuvettes	3033600
Silicone oil, 15 ml bottle	126936
Cuvette cleaning cloth	2687300
Sample degassing kit	4397500
Printer paper for 2100AN, pkg/5 rolls	4709000
Power pack for 2100P/P ISO, 230 V AC/6 V DC	4608000



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword „STABL CAL“, with free downloads of brochure (DOC062.52.00222) and user manual (DOC022.52.00646JUN04)

Titration is made easy with the digital titrator

- Ready immediately, anywhere; mains-independent
- 40 methods available
- Easy handling
- Reliable results
- Wide range of accessories



Fast and simple

Titration is a very widely used analysis method, e.g. for cooling and boiler water. As well as in the laboratory, it is popular in the field, where speed and simplicity are of the essence. The sturdy digital titrator and its practical accessories provide reliable data, quickly and easily.

No glass burette needed

The digital titrator is a precise dispenser, into which compact cartridges with concentrated titrant can be inserted. The titrant is added by turning a button. When a colour change occurs, the added volume can be read directly and used to calculate the result. The digital titrator can be held by hand or in a laboratory stand.

Fully equipped for 40 methods

Parameter-specific titrants for more than 40 methods are available in easily exchangeable, resealable cartridges, each of which is good for up to 100 titrations. Everything is included in the carrying case: digital titrator, cartridges, buffer solutions and delivery tubes.



Digital titrator and cartridge with delivery tube

Titrants for digital titrator, order no. * 1690001

Art. No.*	1690001	PARAMETER	MEASURING RANGES
		Acid/base	1 – 4,000 mg/l
		Acidity	10 – 4,000 mg/l
		Alkalinity	10 – 4,000 mg/l
		Carbon dioxide	10 – 1,000 mg/l
		Chloride	2.5 – 10,000 mg/l
		Chlorine (free)	0 – 3 mg/l
		Chlorine (total)	0 – 70,000 mg/l
		Chromate	20 – 400 mg/l
		Hardness (Ca)	1 – 200 °dH
		Hardness (total)	1 – 200 °dH
		Hypochlorite	50 – 150 mg/l
		Iron	10 – 1,000 mg/l
		Nitrite	100 – 2,500 mg/l
		Org. acids	100 – 2,400 mg/l
		Oxygen	1 – 100 mg/l
		Salinity	0 – 100 ppt
		Sequestrants	0 – 1,000 mg/l
		Sulphite	0 – 800 mg/l

* Digital titrator and accessories in a case; delivery 800 digits/ml (1.25 µl/digit); accuracy ± 1%

→ Test sets with cartridges and colour indicators for the digital titrator: see page 52-53

Accessories I: glass cells for laboratory photometers

LASA 30/LASA 100
CADAS 200
XION
DR 2800
DR 5000

DESCRIPTION		PHOTOMETER					ART. NO.
Round cells	11 mm, 25/pkg, with rubber stopper	●	●	●	●	●	LCW906
Flow-through cell	10 mm, special optical glass		●		●	●	LZP334
Flow-through cell	10 mm, quartz glass		●			●	LZP168
Flow-through cell	50 mm, special optical glass		●		●	●	LZP335
Flow-through cell	50 mm, quartz glass		●			●	LZP336
Semi-microcell	50 mm, special optical glass	●		●	●	●	LZP269
Semi-microcell	50 mm, special optical glass, blackened		●				LZP169
Plastic semi-microcells	50 mm, with lid, 10/pkg	●	●	●	●	●	LZP341
Plastic cells	10 mm, 1,000/pkg	●	●	●	●	●	EBK019
Rectangular cell	10 mm, special optical glass, 3/pkg	●	●	●	●	●	LZP045
Rectangular cell	10 mm, quartz glass		●			●	LZP332
Rectangular cell	20 mm, special optical glass	●	●	●		●	LZP331
Rectangular cell	20 mm, quartz glass		●			●	LZV008
Rectangular cell	50 mm, special optical glass	●	●	●	●	●	LZP167
Rectangular cell	50 mm, quartz glass		●			●	LZP333
Rectangular cells	1 inch, matched pair, glass, 10 ml	●	●	●	●	●	2495402
Rectangular cells	10 mm, matched pair, glass, 3.5 ml				●	●	2095100
Round cell	1 inch, glass, 10 ml, with cap				●	●	2122800
Round cells	1 inch, glass, 10 ml, with cap, 6/pkg				●	●	2427606
Disposable rectangular microcells	10 mm, 1.5 ml, 100/pkg				●	●	2629500
Rectangular cell	50 mm, glass, 17.5 ml	●	●	●	●	●	2629250
Rectangular cell	50 mm, quartz glass, 17.5 ml		●			●	2624450
Rectangular flow-through cell	1 inch, for flow-through cell kit 5940400				●	●	5913700
Rectangular cells	1 inch, matched pair, glass, 25 ml				●	●	2665902
Rectangular cells	1 inch, matched pair, glass, 25 ml, with stopper				●	●	2612602
Disposable rectangular cells	1 inch, polystyrene, with lid, 12/pkg				●	●	2410212
Round cells	1 inch, glass, 25 ml, with cap, 6/pkg				●	●	2401906
Round cells	1 inch, plastic, with lid, 6/pkg				●	●	5940506
Plastic cells	1 inch, with measurement window for 10 mm path length, 2/pkg				●	●	4864302
Rectangular cell	10 mm, quartz glass, 3.5 ml, spectrum 170-2,700 nm		●			●	2624410
Rectangular flow-through cell	10 mm, quartz glass, 160 µl		●			●	A24209
Rectangular flow-through cell	10 mm, quartz glass, 450 µl		●			●	LZV510
Rectangular flow-through cell	50 mm, quartz glass, 370 µl		●			●	LZV649
Rectangular flow-through cell	3 mm, quartz glass, 100 µl		●			●	LZV638

→ More information about the DR 2800, DR 5000 and XION laboratory photometers: see page 34–37

Accessories II: Thermostats – precise temperature control

WW

DW

PW

8



Dry thermostat
LT 200



High temperature thermostat
HT 200S

Perfectly matched HACH LANGE measurement systems

For both standard and customised digestions, the LT 200 is the ideal complement to photometric measurement instruments. Available as a single or double block with different compartments for round cuvettes and reaction vessels.

Benefits include: simple operation, great programming flexibility and reliable operation.

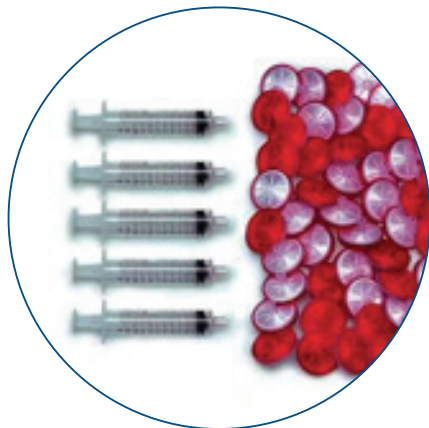
The HT 200S – for highly efficient digestion

In just minutes, the HT 200S thermostat heats up to 170 °C and then cools down again. This saves valuable working time during and after the digestion! E.g. with the help of the HT 200S, COD results can be obtained in just 35 minutes.

Technical data

	DESCRIPTION	ART.-NO.
LT 200 dry thermostat	With compartments for 13 and 20 mm diameter, programmed for 40, 100, 148 °C; freely selectable: 37–150 °C, 1–480 minutes digestion time; heating time from 20 to 148 °C: 10 minutes ± 1 °C in conformity with EN, ISO, EPA	
	1 heating block with 11 compartments: 9 x 13 mm diameter, 2 x 20 mm diameter	LTV082.99.10002
	2 heating blocks with 25 compartments: 21 x 13 mm diameter, 4 x 20 mm diameter	LTV082.99.21002
	2 heating blocks with 30 compartments: 30 x 13 mm diameter	LTV082.99.23000
	2 heating blocks with 20 compartments: 12 x 13 mm diameter, 8 x 20 mm diameter	LTV082.99.51000
DRB 200 dry thermostat	With compartments for 16 and 20 mm diameter, programmed for 100, 105, 150, 165 °C; freely selectable: 37–165 °C, 1–480 minutes digestion time; heating time from 20 – 150 °C: 10 minutes ± 1 °C in conformity with EN, ISO, EPA	
	1 heating block with 11 compartments: 9 x 16 mm diameter, 2 x 20 mm diameter	LTV082.99.30001
	1 heating block with 15 compartments: 15 x 16 mm diameter	LTV082.99.40001
	2 heating blocks with 25 compartments: 21 x 16 mm diameter, 4 x 20 mm diameter	LTV082.99.42001
	2 heating block with 30 compartments: 30 x 16 mm diameter	LTV082.99.44001
HT 200S high temperature dry thermostat	1 heating block with 12 compartments for 13 mm diameter; For time-saving 15-minute digestion for COD, total nitrogen, phosphate and heavy metals; heating phase: max. 8 minutes; active sample cooling: max. 13 minutes; three standard programmes (100 °C/148 °C/high temperature) and nine freely selectable programmes; digital display for time (5–240 minutes) and temperature (40–150 °C)	LTV077

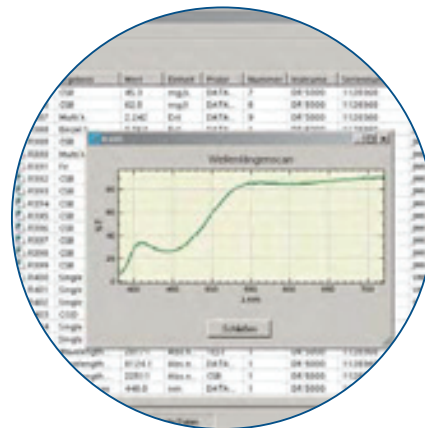
Accessories III: Sample preparation, pipettes and much more



Specific sample preparation for tests



Variable piston pipettes; flexible, with exact dispensing for all tests



Software for data transfer from instrument to PC

Accessories—a selection

DESCRIPTION		ART. NO.
Chloride elimination set	For removing interfering chloride loads, e.g. for nitrate analysis	LCW925
Membrane filtration set (1.2 µm)	Consisting of 50 special filter membranes (1.2 µm) and disposable syringe (10 ml)	LCW904
Membrane filtration set (0.45 µm)	Consisting of 50 special filter membranes (0.45 µm) and disposable syringe (10 ml)	LCW916
CRACK SET	For the digestion of complex, colloidal or undissolved metals	LCW902
Reaction vessels	With screw top, 5/pkg	LZP065
Powder dispenser	For TOC tests LCK 380/381, chlorine test LCW 510 from LANGE	LCW912
Screening test	For the detection of interfering organic sequestrants	LCW907
SwiftTest	Powder dispenser for HACH free chlorine test	2802300
SwiftTest	Powder dispenser for HACH total chlorine test	2802400
Chloride test strips	Meas. range 300–6,000 mg/l as pre-test and for detecting interference with COD/nitrate tests	2751340
Laboratory magnetic stirrer	0–1,500 rpm for homogenising and for enriching AOX	LYW977
Magnetic stirring rods	3 rods for LYW977 laboratory magnetic stirrer	LYW064
TOC-X5 shaker	Shaker/fan combination for accelerated expulsion of inorganic carbon for TOC cuvette tests LCK385/386/387	LQV148.99. 00001
Electronic pipette	0.2–5.0 ml	BBP087
Piston pipette	0.2–1.0ml	BBP078
Piston pipette	1.0–5.0ml	BBP065
Pipette tips	For piston pipette (0.2–1.0 ml)	BBP079
Pipette tips	For piston pipette (1.0–5.0 ml) and electronic pipette BBP087	BBP068
Pipette test set	For checking pipettes BBP078/065/164/087 (for 4 determinations)	LCA722
Cuvette stand	For 16 LANGE round cuvettes or rectangular cuvettes (10 mm)	LYW915
Digital laboratory timer	Accurate to the second, for short periods (0–24 hours), with clip and magnet	LZC902
Protective goggles	Uvex, green/purple, to DIN 58211	EZZ042
Test solution set	For checking the photometric accuracy of measurement systems	LZP181
Test filter kit	For checking DR 2800 and DR 5000 photometers	LZV537
HACH LINK	Software for transferring data from HACH photometers via an interface to a PC	4966500
HACH DATATRANS	Software for transferring data from DR 2800 and DR 5000 photometers via a USB interface to a PC; languages: German/English/French/Italian/Spanish; complete with CD, cable, manual	LZY274

→ For quality assurance products: see page 66

→ More accessories: see www.hach-lange.co.uk, www.hach-lange.com

Accessories IV: Documenting data

WW

DW

PW



NEW!

Simple data transfer using USB technology

USB technology—the simple and fast way of transferring data

USB technology has enormously simplified the transfer of data between systems. USB ports are now a feature of the DR 2800 and DR 5000 spectrophotometers too. They make the processing of analytical data a lot easier. USB ports or a USB memory stick are used to transfer measured values, e.g. to LIMS, and to download updates to the spectrophotometers more smoothly and reliably than ever before.

→ **More information about the DR 2800 and DR 5000 spectrophotometers:** see pages 34–36



NEW!

Compact thermal printer documentation

Space saving printer

There may not always be a PC available beside the measuring instrument, or there may not be enough space in the laboratory for a conventional printer. In these circumstances, space-saving compact printers enable the results to be documented next to the instrument.



The external barcode scanner can be connected to the photometer

Instant scanning of samples

The DR 2800, DR 5000, LICO, CADAS and XION laboratory photometers enable samples to be identified automatically from their barcodes. The external barcode scanner is connected to the photometer. It automatically recognises individual and standard barcodes.

→ **More information about the DR 2800, DR 5000 and XION spectrophotometers:** see pages 34–37

Technical data and order information

DESCRIPTION		ART. NO.
USB ink jet printer	HP DeskJet 6540 for DR 2800 and DR 5000 photometers (DIN A4 paper)	LYW368
Measured value printer	For all current HACH instruments	A70P020
DPU414 measured value printer, parallel	Thermal printer with parallel cable for XION and GANIMEDE photometers	LQV144.99.00000
DPU414 measured value printer, serial	Thermal printer with serial cable for LICO and LASA photometers	LQV144.99.10000
Printer paper	For DPU414 measured value printer	LZP180
Barcode scanner, serial	For XION, CADAS and LICO photometers	LZV261
Barcode scanner, USB	For DR 2800 and DR 5000 photometers	LZV566
Compact keyboard	For USB port (English keyboard layout)	LZV582
USB memory stick	128 MB data storage device for data transfer	LZV568
Sample changer for GANIMEDE automatic laboratory analyser	With 36 x 30 ml sample carousel, automatic needle rinse	LQV134.00.30000
	With 53 x 15 ml sample carousel, automatic needle rinse	LQV134.00.40000
Additional software for DR 5000 Spectrophotometer	MEBAK brewery analysis, application software	LZV570
	Drinking water analysis, application software	LZV571

WW
 DW
 PW

Accessories V: Gas detectors, microscopes, balances



High performance—the LEICA DM 1000 laboratory microscope



Portable—the ACCULAB VICON scales from SARTORIUS



Sensitive—the GFG POLYTEKTOR G 750 multi-gas detector with 6 sensors

Analysis accessories—a selection

ART. NO.	NAME	DESCRIPTION
SM12403X	GFG POLYTEKTOR G 750 gas detector	<ul style="list-style-type: none"> – Light and compact 6-sensor multi-gas detector with alarm functions and simultaneous display of all measured gas hazards; 0–100 vol% measuring range available for combustible gases, ATEX approved – Modular plug-on system for easy adjustment – Intelligent sensors, e.g. for O₂, H₂S, infrared CO₂, CH₄, are simply plugged in and are immediately recognised, together with all their settings, by the meter – Acoustic (90 dB, 30 cm) alarm; optical alarm on large, highly visible, LED – Simple to operate; only one key in normal mode – Dimensions: approx. 770 g, 90 x 210 x 60 mm
SM1349-0001	LEICA CME microscope	Basic laboratory microscope with excellent image quality, rugged design and large selection of accessories: all-glass optics, standard 1.25 N.A. slider condenser for phase contrast applications, e.g. sewage treatment sludge, as well as for oil immersion and darkfield applications
SM0881108	LEICA DME microscope	High-performance laboratory microscope for brilliant, high contrast imaging quality with universal condenser and HI PLAN phase contrast objectives for high contrast, good image levelling and chromatic correction; lots of upgrade options
SM11888133-0001	LEICA DM 1000 microscope	High-performance laboratory microscope for unparalleled optical brilliance and ergonomics, ideal for the bacteriological laboratory, also with high throughput; with condenser and HI PLAN phase contrast objectives, upgradable with fluorescence axis
SM3240303	ACCULAB balance	Laboratory scales with illuminated LCD, capacity 300 g, resolution 0.001 g
SMTE313S	SARTORIUS TE313S balance	Electronic precision balance with 7-segment display, stability range recognition and 4 selectable balance filter levels, RS-232-C interface, optional ISO/GLP-compliant documentation, capacity 310 g, resolution 0.001 g
SM324035M	SARTORIUS MA35M moisture analyser	Compact meter for fully automatic determination of moisture content or total dry solids; shortest measurement time from 1.0 g initial sample weight, accuracy ± 0.2% (sample < 5 g) or ± 0.05% (sample > 5 g), capacity 35 g with 1 mg resolution, determination method fully automatic or with set time of 0.1–99 min
SM324045Q	SARTORIUS MA45Q moisture analyser	See above, except capacity 45 g with 1 mg resolution, determination method fully automatic, semi-automatic 1–20 mg/24 sec or with set time of 0.1–99 min

→ An "X" in the art. no. indicates that different configurations are available.

→ More information about gas detectors, microscopes, balances, thermometers and other analysis accessories are available on request.

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
→ See page 84



TITRALAB titration systems now with RFID—for simple and reliable GLP
→ See page 86

GANIMEDE
Analysers with
patented flash
digestion for total N
and total P
→ See page 90



QUICKCHEM 8500 FIA analyser with ready-to-use reagents, for up to 120 samples per hour
→ See page 89

AP 300 DISCRETE
Analysers with dual
pipette system for up to
300 samples per hour
→ See page 88

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

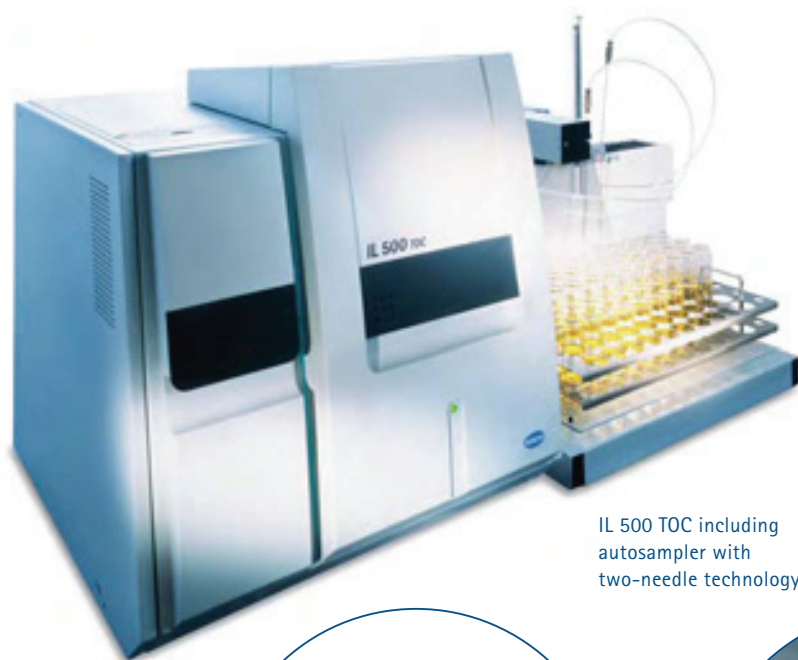
Getting the right result

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

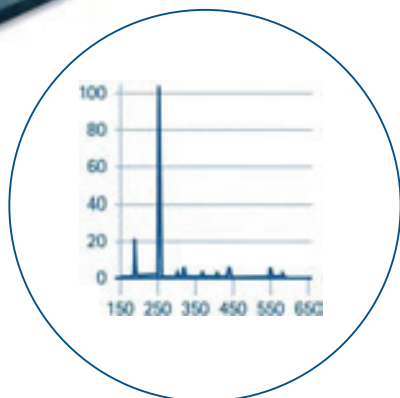
The direct injection with a 700 µm needle guarantees excellent particle tolerance. The furnace temperature of 950 °C and the optimised catalyst packing enable particle containing samples as well as the most poorly digestible substances to be oxidised completely. The long service life is assured even 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 SO₂: wine, fruit juices

Environment and water

- pH and alkalinity
- Total hardness
- Chloride
- COD

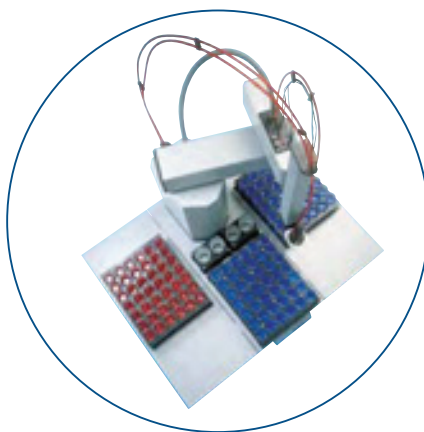
Chemical and electroplating

- 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	
Burettes								
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					•	•		
Techniques								
pH/mV measurements	•	•	•	•	•	•		
Endpoint titration	•	•	•	•	•	•		
Inflection point titration	•		•	•	•	•		
pH-stat titration		•						
Volumetric Karl Fischer titration						•	•	
Conductivity measurements				•				
ISE measurements				•				
Titrant addition techniques								
Continuous dynamic	•	•	•	•	•	•		
Incremental monotonic and dynamic	•		•	•	•	•	•	
Peripherals								
			Samplers, balance, printer, PC software					
Electrode inputs for								
Indicator electrodes	1				2		1	
Reference electrodes					1			
Polarised electrode					1			



More information at www.hach-lange.co.uk, 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.

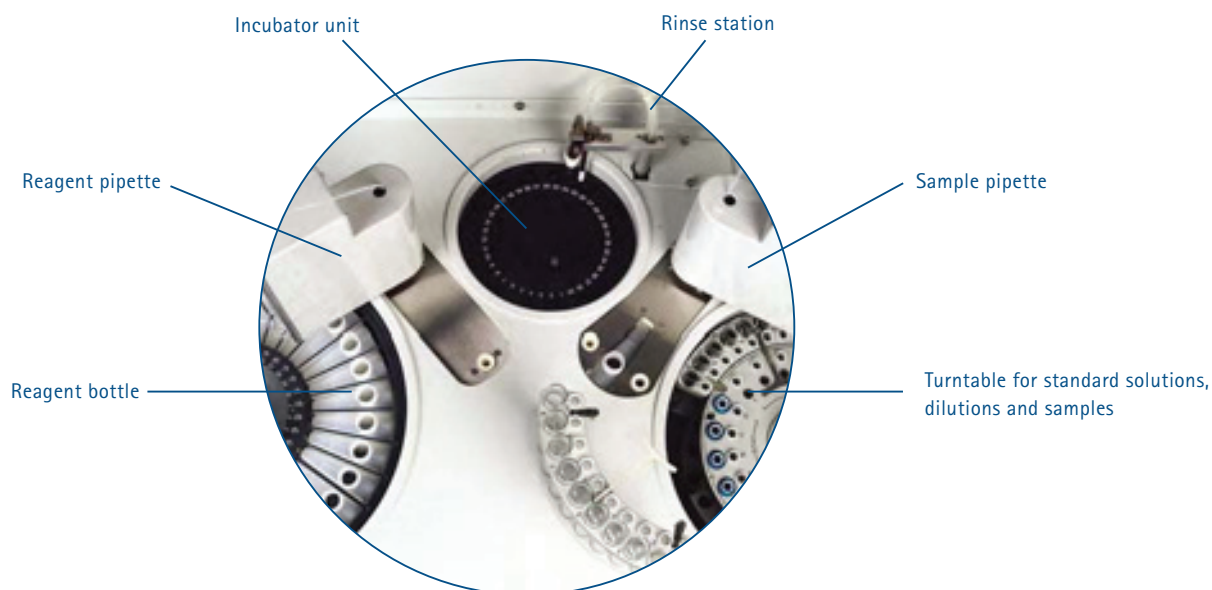
DW

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 1.00–20.0 mg/l	Berthelot	D-10-107-06-1-A	52921
Ammonium, acid-stabilised samples	0.03–2.00 mg/l 1.00–20.0 mg/l	Berthelot	D-10-107-06-1-B	52918
Chloride	1.00–50.0 mg/l 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 0,015–1,00 mg/l	Molybdate	D-10-115-01-1-A	52923

Efficiency and high sample throughput with FIA – QUICKCHEM 8500

WW

DW

PW

- 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_b
- Integrated fast digestion
- Ready-to-use reagents
- Portable control unit
- Simple handling



Specific analysis units with integrated digestion or total P and TN_b

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 ₄ -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	230 V/50 Hz (optional 110 V)
Colour display	5.7 inch; IR interface
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 _b
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	230 V/50 Hz (optional 110 V)
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 _b , 100 determinations, article no. GCA200

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

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Email: sales@greyhoundchrom.com

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