

# Process Instrumentation

Products & services for drinking water and wastewater



# Instrumentation, solutions and service all from a single manufacturer

With high quality products, consumables/accessories and comprehensive services, HACH LANGE is your ideal partner for water analysis. Providing cost-effective solutions for all your process needs.

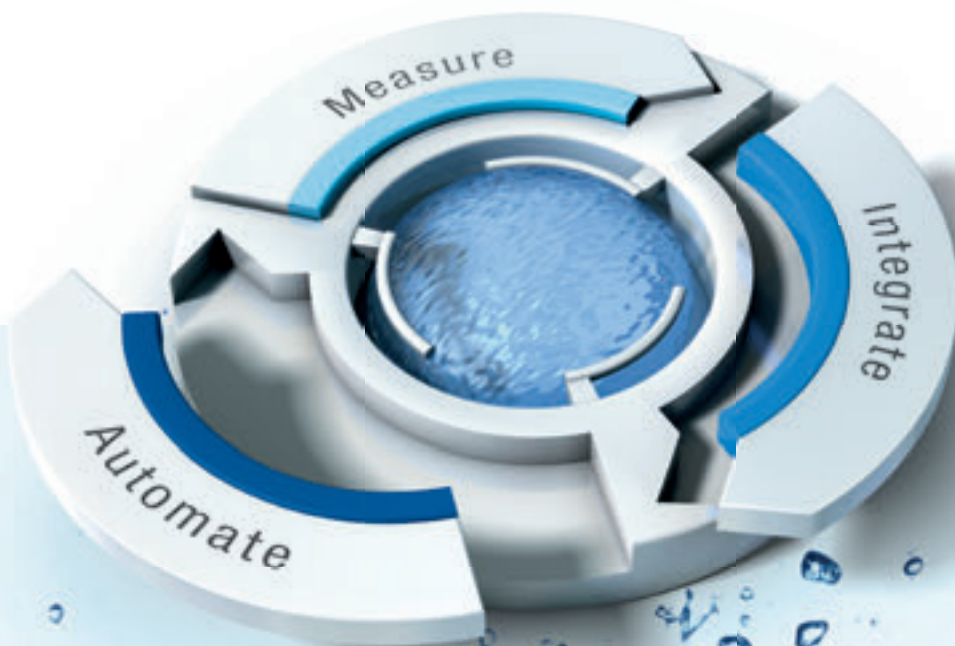
HACH LANGE provides a complete suite of analytical online measurement instrumentation and integrated networked solutions.

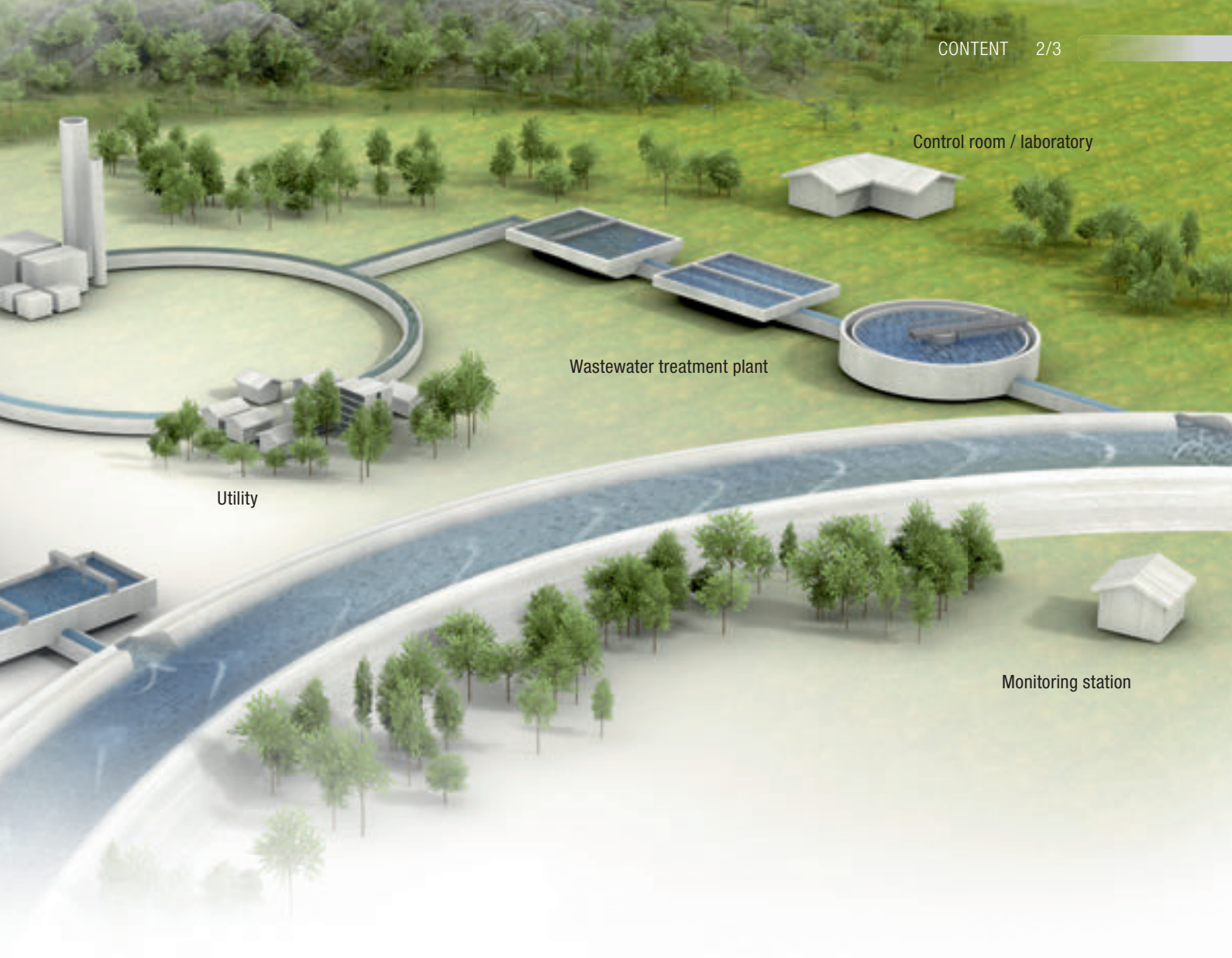
Whether you are responsible for multi-parameter online instrumentation or simply need to measure single parameters, we have the solution for you.

We believe the future of test and measurement lies in reliable, future-proof modular instruments, providing solutions that are tailored to your needs.

Industry

Waterworks





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# Measure accurately, measure digitally

Optimisation begins with measuring the right value with the right products.

With HACH LANGE, you have access to a large product range. From digital sc probes and analysers to stand alone or networked digital controllers.

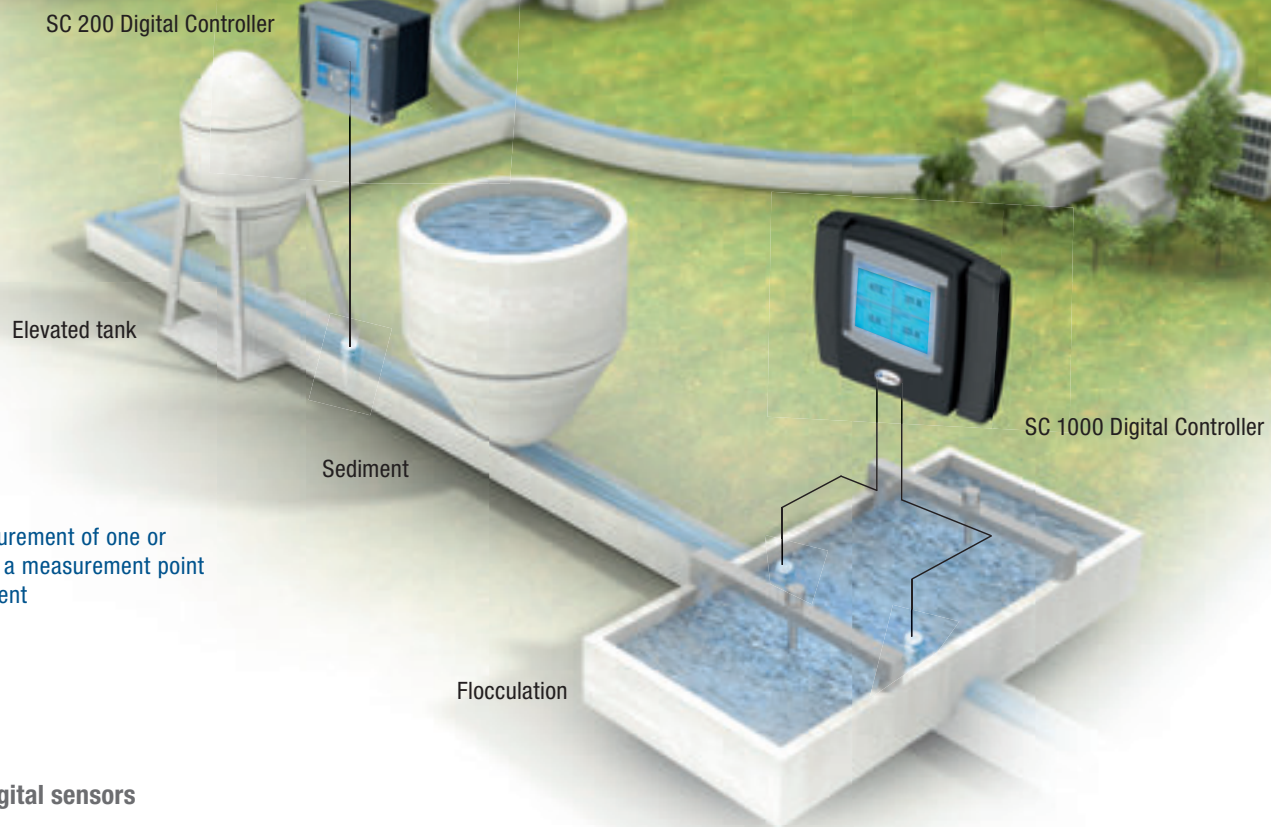


LDO sc oxygen probe

## The best method to measure oxygen

You need reliable measurement values. With the optical LDO sc probe, you can measure cost effectively and accurately. The measurement technique, introduced by HACH LANGE in 2003 as a world first, provides a long service life with a minimum amount of maintenance.

The LDO sc is calibration and drift-free, without need for flow and without interference from  $H_2S$ . Measurement values are the solid basis for your open and closed loop control. Now with a 3 year warranty for extra reliability.



Decentralised measurement of one or more parameters at a measurement point during water treatment

### Mix and match digital sensors

HACH LANGE, has a unique variety of digital sensors with built-in intelligence, which allow the probes to store calibration data and configuration information.

The sensors communicate with the SC Digital Controllers. They are connected and commissioned very easily via Plug & Play.

Key benefits:

- ▶ Standard controllers for all probes and analysers
- ▶ Easy handling/operation
- ▶ Up to 8 sensors connected to one controller
- ▶ Can be used as stand alone instrument or in a network
- ▶ Future-proof/modular system, upgradeable at any time

### Measure with HACH LANGE

“I receive the right information at my measurement points.”

- ▶ SC Controller  
Page 12
- ▶ LDO sc probe  
Page 18
- ▶ Instrument service  
Page 40–41



Plug & Play: new sensors are detected immediately by the SC Controller.



# Integrate intelligently, integrate digitally

Our SC Controllers are a standard platform for all probes and analysers. They integrate easily in your plant: via 4–20 mA output, SC 1000 bus, PROFIBUS or other field bus systems. For the active use of measurement results for open and closed loop control.



AN-ISE sc probe for ammonium and nitrate

## Verified measurement values

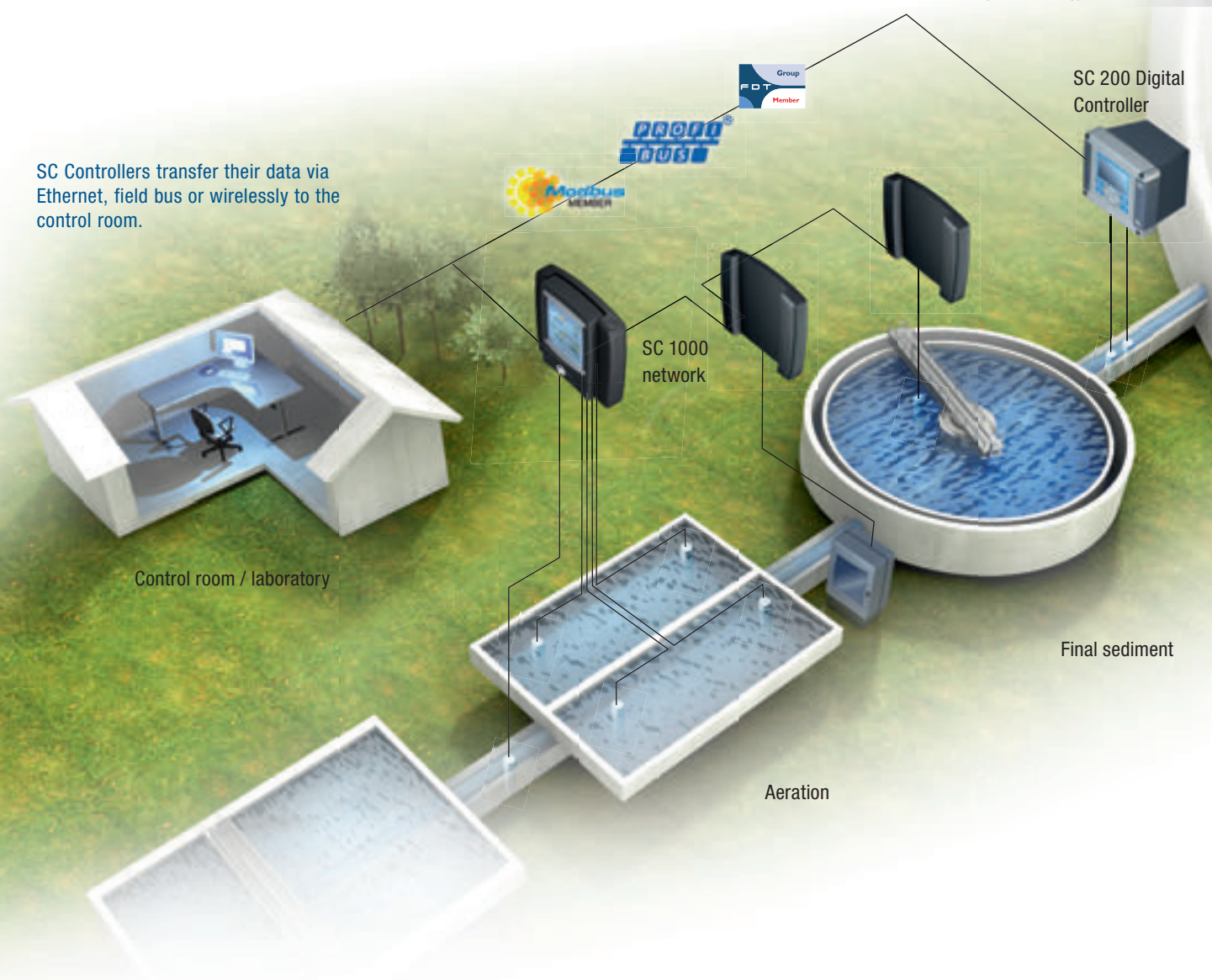
Each SC sensor features detailed self diagnosis. It permanently monitors the plausibility of its signals and the reliability of the results.

Verified measurement values are the basis for optimal and reliable process control. Thanks to LINK2SC technology, the verification of the process probe with the laboratory values is reliable and user friendly.

LINK2SC connects the laboratory photometer to the SC Digital Controller and probe.

You can obtain a direct comparison between laboratory and process results. The process probe is recalibrated by the laboratory photometer.

SC Controllers transfer their data via Ethernet, field bus or wirelessly to the control room.



**Digital reliability and integration**

With the Digital SC Controllers, you quickly build up an analysis network. The SC 1000 bus greatly simplifies installation and wiring, saving on costs whilst achieving improved signal quality.

Automation components and field instrumentation from other manufacturers are integrated just as easily into the open system as analogue sensors.

A variety of communication options and standards ensure that the instrumentation is perfectly suited to your infrastructure.

**Integrate with HACH LANGE**

“The data is integrated in my control system. I can simply connect new sensors via Plug & Play.”

- ▶ Nutrient sensors  
From page 22
- ▶ Network service  
Page 41
- ▶ Laboratory analysis  
Page 42–43



NITRATAX sc optical nitrate probe, e.g. for the closed loop control of denitrification times



PHOSPHAX sc phosphate analyser, e.g. for the closed loop control of precipitant dosage



# Automate future-proof, automate digitally

HACH LANGE can help you automate your processes, whatever its size and requirements. At the same time, allowing you to retain your ability to act and intervene in your processes and upgrade at any time.

**NEW**



SC 1000 Digital Controller

## Transparent measurement values

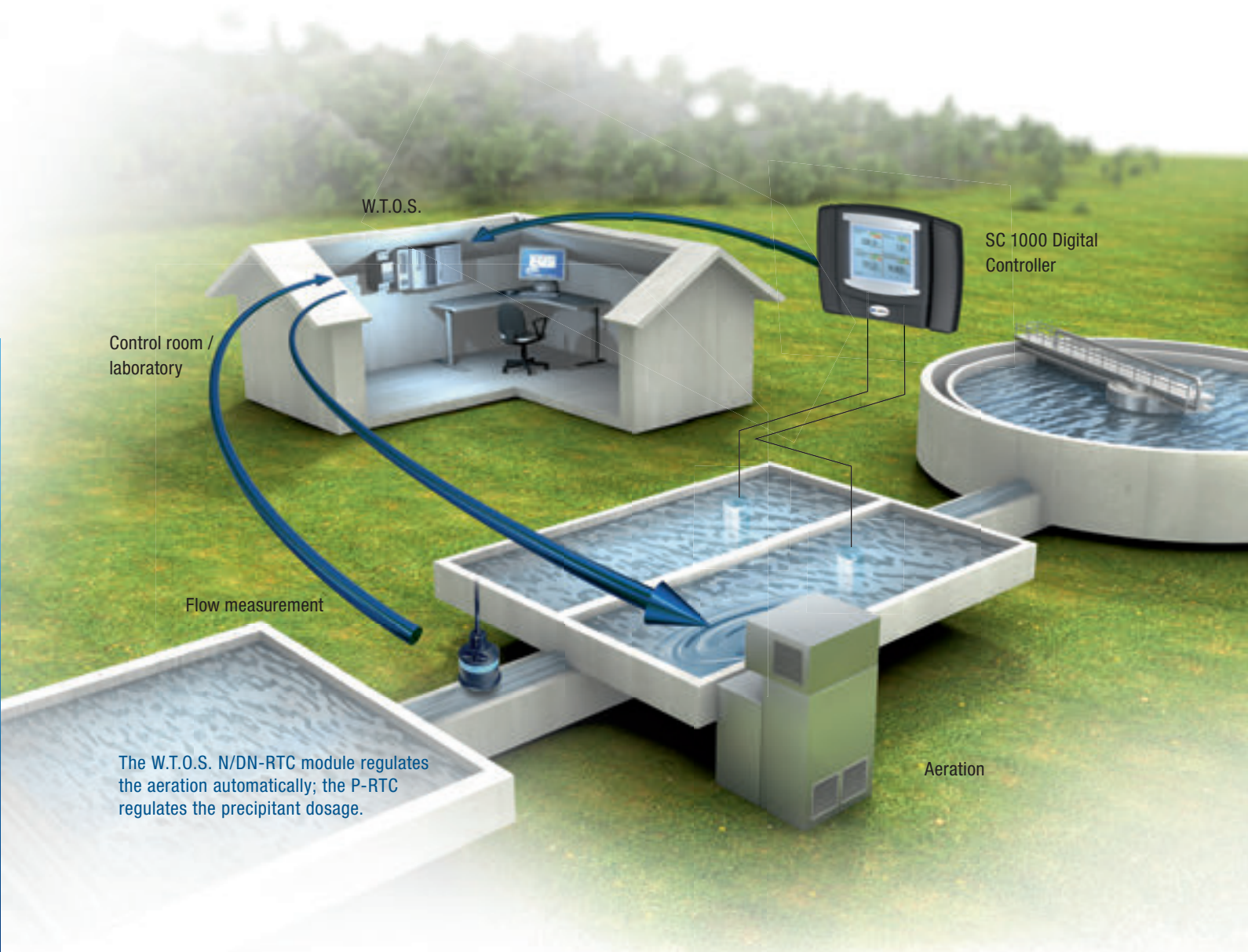
The PROGNOSYS software in the SC 1000 Digital Controller monitors the measurement value quality and indicates the time remaining to the next maintenance task.

Each sensor is shown in the display. Messages indicate upcoming maintenance, such as the cleaning of the sensor or the refilling of reagents. The same applies to service tasks that require an engineer.

All messages have a programmable advance warning function. So you can call a service engineer or order in good time.

The consistent, timely performance of the tasks guarantees a long term increase in measurement value quality and sensor availability.





## Automate with HACH LANGE

"I have confidence in my effluent values. I have recovered my costs quickly."

- ▶ W.T.O.S. modules  
Page 30–31
- ▶ Instrument service  
Page 40–41

### Cost-effective process optimisation with W.T.O.S.

The standardised W.T.O.S. (Water Treatment Optimisation Solutions) open and closed loop control modules enable you to quickly optimise your wastewater treatment plant. W.T.O.S. can be easily integrated with existing structures.

The P-RTC module for chemical phosphate elimination regulates the dosage of the precipitant according to the load.

This can save up to 28% precipitant and thus greatly reduces the amount of precipitated sludge, with a reliably ob-

served measurement value for total P in the effluent!

The N/DN-RTC module, on the other hand, aims for minimum total nitrogen with as little energy consumption as possible.

W.T.O.S. leads to stable effluent values even at load peaks. An investment that pays off, even for small plants!

# Value added services

Personal contact with the developer, manufacturer and supplier of sophisticated measurement systems is important. Our experienced team can provide you with expert advice to ensure your application satisfies all your requirements.

The close customer relationship begins with expert advice before the purchase and continues over the entire lifetime of the products to ensure:

**Consultants & system integrators:**

- ▶ Are supported during planning.
- ▶ Are given a fixed contact partner for the entire course of the project.

**Decision makers & operators:**

- ▶ Have all relevant information in their local language.
- ▶ Have access to an application specialist about measuring instrumentation.

**Users:**

- ▶ Receive basic instruction directly at the instrument, with the focus on operation and maintenance.
- ▶ Benefit from regular training and technical support.





## ▶ HACH LANGE SERVICES



### Experts on hand

Technical support, workshops/seminars and training



### Quality assurance

Certified buffers and standards, instrument checks and round robin tests



### Environmental

Legal/environmental compliance via the recycling/disposal of used reagents



### Information

Phone, brochures, website, user manuals, application reports, safety data sheets and regular industry news



### Instrument service

Inspection and maintenance services, on site or carried out at our service centre

## Focus on sustainability

We strive to protect the environment and preserve natural resources:

- ▶ Economical use of reagents during analysis
- ▶ Recycling and correct processing of used reagents in the Environmental Centre
- ▶ Winners of several awards for sustainability
- ▶ Reduced use of precipitation and flocculation agents
- ▶ Reduced energy consumption due to optimised open and closed loop control concepts

## Working with HACH LANGE

“I have strengthened my business working with a reliable and competent company.”

- ▶ Controllers + transmitters  
Page 12–13
- ▶ Probes + analysers  
From page 14
- ▶ Samplers  
Page 32–33
- ▶ Flow + level  
From page 34
- ▶ System solutions  
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- ▶ Instrument service  
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- ▶ Laboratory analysis  
Page 42–43

We have subsidiaries in over 20 countries across Europe, with qualified teams of sales consultants, service technicians, technical support and order processing.



# CONTROLLERS

## DIGITAL CONTROLLERS

### The SC platform: Reliable and cost-effective; today and for the future











As a stand alone instrument or integrated into a network, the controllers are the uniform interface between you as the operator and your plant.

Digital signals between the SC Controller and attached sensors assure data integrity and immunity from signal interference.

The probes and analyser are detected automatically by the SC Controller (Plug & Play). The SC concept provides you with all the advantages of a common platform:

- ▶ High degree of reliability and minimum training due to uniform, easy handling
- ▶ Future-proof system that can be upgraded with additional sensors at any time.
- ▶ Cost-effective operational assurance

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back of this catalogue.**

Product	SC 1000	SC 200
		
	<b>NEW</b>	<b>NEW</b>
<b>Description</b>	Digital universal controller for up to 8 sensors, upgradable to a network	Digital Controller for up to 2 sensors
	   	   
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Expandable to an SC network</li> <li>▶ Reliable data transfer over large distances with minimum wiring</li> <li>▶ Security at all times for unmanned plants with GPRS</li> <li>▶ Intuitive operation via touch-screen with brilliant colour graphics and trend function</li> <li>▶ Existing sensors can be integrated</li> <li>▶ Transparent measurement value quality with PROGNOSYS software (optional)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Versatile application due to the combination of analogue and digital sensors</li> <li>▶ Software update and data logger via SD card, easy handling</li> <li>▶ Control panel installation possible</li> </ul>
<b>Parameters</b>	pH value, redox potential, conductivity, oxygen, nutrient parameters, organic load, disinfection parameters, turbidity, solids, sludge	pH value, redox potential, conductivity, oxygen, nutrient parameters, organic load, disinfection parameters, turbidity, solids, sludge, flow
<b>Communication</b>	Up to 12 outputs 0/4–20 mA, certified PROFIBUS DP/V1, MODBUS TCP/IP, RTU RS485/RS232; GPRS quad band, OpenVPN client (optional); industrial Ethernet port; built in web server; 24 languages; email/SMS dispatch	Up to 5 outputs 0/4–20 mA, certified PROFIBUS DP/V1 slave, MODBUS RTU RS485/RS232; supports EDD and DTM technology
<b>Protection class</b>	IP 65	IP 66/NEMA 4X
<b>Display type</b>	Glass/glass touchscreen, TFT colour graphics	LCD with LED backlight
<b>Measurement data and event archiving</b>	SD card	SD card
<b>Power supply</b>	100 ... 240 V AC, 24 V DC (optional)	100 ... 240 V AC, 24 V DC (optional)

\*Applied for



ANALOGUE TRANSMITTERS

SI792

SI794

SI6XX



Analogue transmitter for 1 sensor, EX version available

Analogue transmitter for 1 sensor, with relay contact

Analogue transmitter for 1 sensor



- ▶ 2 wire transmitter
- ▶ Automatic self diagnosis for reliable operation
- ▶ ATEX certified version (optional)

- ▶ 4 wire transmitter
- ▶ Flexible power supply
- ▶ PID process controller via relay contacts

- ▶ ON/OFF closed loop control
- ▶ With three relays for programming as a limit value or for the activation of automatic cleaning
- ▶ Variants for wall or control panel installation

pH value, redox potential, conductivity, oxygen

pH value, redox potential, conductivity, oxygen

pH value, redox potential, conductivity

1 output 4–20 mA, HART, PROFIBUS PA (optional), FOUNDATION FIELDBUS H1 (optional)

2 outputs 4–20 mA

1 output 4–20 mA

IP 65/NEMA 4X

IP 65/NEMA 4X

IP 54/IP 65

LCD

LCD

LCD

10 ... 30 V DC, bus supply  
9 ... 17.5 DC FISCO

20 ... 253 V AC/DC,  
45 ... 65 Hz VariPower

230 V AC, 115 V AC, 24 V AC

# PARAMETERS

## TURBIDITY, SOLIDS, SLUDGE

### Product

### SOLITAX sc family

### TSS sc family

### From ultra-clear water to sludge

In drinking water treatment and wastewater purification, undissolved substances in water demand special attention.

Clear water requires consistent filter management in order to guarantee operational reliability as cost effectively as possible.

Continuous turbidity analysis supplies you with the requisite data for this. Sludge generating processes also require continuous monitoring in order to keep both operational reliability and the costs for sludge dewatering and disposal under control.



### Description

Digital process probes for the determination of turbidity and solids in drinking water and wastewater in accordance with DIN EN ISO, ideal for municipal and industrial wastewater

Digital special probes for determining turbidity and suspended solids in aqueous, and also aggressive, media, particularly in an industrial context, in accordance with DIN EN ISO



### Benefits

- ▶ Broad application spectrum due to very large measuring range for turbidity and solids
- ▶ Reliable sludge analysis via unique colour independent solids measurement
- ▶ Long-term stable factory calibration for turbidity measurement
- ▶ Low maintenance due to self-cleaning wiper device
- ▶ Available as immersion and inline probes

- ▶ Ideal probes for high temperatures and pressures, for hygienically pure environments, for corrosive media
- ▶ Reliable results in difficult industrial applications due to special optics
- ▶ Robust materials, e. g. titanium
- ▶ Diverse mounting devices, e. g. TRICLAMP and VARIVENT fittings
- ▶ ATEX-certified version (optional)

### Measuring range

**t-line sc:** 0.001 ... 4,000 FNU  
**ts-line sc/inline sc:** 0.001 ... 4,000 FNU, 0.001 ... 50 g/L  
**hs-line sc/highline sc:** 0.001 ... 4,000 FNU, 0.1 ... 500 g/L

0.001 ... 4,000 FNU  
 0.001 ... 500 g/L

### Method

Infrared duo scattered light method; turbidity in accordance with DIN EN ISO 7027; solids equivalent to DIN 38414

Combined multiple-beam/alternating light method with IR diode system and beam focusing; turbidity in accordance with DIN EN ISO 7027

### Application area

Raw water and well water, surface water, drinking water, process water, municipal and industrial wastewater, sludge dewatering, sludge recirculation

In process monitoring e. g. in chemical, pharmaceutical, paper, food and drink industries, industrial wastewater, seawater



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TURBIDITY				
	SONATAx sc	SS7 sc	ULTRATURB plus sc	1720E sc
				
	<b>NEW</b>			
	Digital ultrasonic probe for the continuous determination of the sludge level or the sludge height	Digital turbidity bypass sensor for contact free measurement of medium to high turbidities, also optional for hot and/or corrosive liquids	Digital turbidity bypass sensor in accordance with DIN EN ISO for ultra-clear to moderately turbid media	Digital turbidity bypass sensor in accordance with USEPA for fine turbidities
	<ul style="list-style-type: none"> <li>▶ Simple, fast commissioning and configuration due to new probe software</li> <li>▶ Low maintenance due to magnetically coupled wipers</li> <li>▶ Graphic display of sludge profile on SC 1000 Controller</li> <li>▶ Precise measurement due to automatic temperature compensation</li> <li>▶ Various mounting devices, including for chain scrapers</li> </ul>	<ul style="list-style-type: none"> <li>▶ Due to the robust construction, an ideal sensor for aggressive sample flows with high solids content</li> <li>▶ Low maintenance, as the optics have no contact with sample</li> <li>▶ Simple verification with formazine and/or solids standard</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stable results due to self-cleaning measuring chamber and compensation of air bubbles</li> <li>▶ Versatile application due to the large measuring range</li> <li>▶ Robust design and materials, suitable e. g. for seawater</li> <li>▶ Simple verification with long-term stable STABL CAL standards</li> </ul>	<ul style="list-style-type: none"> <li>▶ Air bubble elimination via bubble trap for reliable measurement values</li> <li>▶ Simple verification with solids standard or long-term stable STABL CAL standards</li> </ul>
	0.2 ... 12.0 m sludge level	0.01 ... 9,999 NTU (FNU, TE/F)	0.0001 ... 1,000 FNU (NTU, TE/F)	0.0001 ... 100 NTU (FNU, TE/F)
	Ultrasonic measurement	90° scattered light method (white light)	90° scattered light method in accordance with DIN EN ISO 7027 (infrared pulse)	90° scattered light method in accordance with USEPA 180.1 (white light)
	Primary settling/final sedimentation (automatic sludge extraction, avoidance of sludge loss), thickener, SBR reactor	In-process monitoring, industrial water with high turbidity, high temperatures, aggressive media, wastewater containing starches, oils and fats	Raw water and well water, filtration management, filter monitoring, recording of filter breaches, drinking water, seawater	Well water, drinking water, filtration management, filter monitoring, recording of filter breaches

# PARAMETERS

## ULTRA-FINE TURBIDITY

Product	FILTERTRAK 660 sc	ARTI
		
<b>Description</b>	Digital turbidity bypass sensor in accordance with USEPA for ultra-fine turbidities and for detecting particles <math><0.1 \mu\text{m}</math> in ultra-clear liquids	Analogue particle counter for evaluating the water quality by number and size of particles
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Air bubble elimination via bubble trap for reliable measurement values</li> <li>▶ Very low measuring range with highly sensitive laser technology</li> <li>▶ Quick reaction to changes in the sample, early detection of filter breaches via statistical evaluation of measurement data</li> <li>▶ Simple verification with long-term stable STABL CAL standards</li> </ul>	<ul style="list-style-type: none"> <li>▶ Autoscan measures seven particle sizes over time</li> <li>▶ Universal application, as particle sizes can be determined via eight channels in two configurations</li> <li>▶ Easy cleaning and reliable operation due to external counting chamber</li> </ul>
<b>Measuring range</b>	0.001 ... 5,000 mNTU	1.3 ... 100 $\mu\text{m}$
<b>Method</b>	90° scattered light method in accordance with USEPA 10133 (laser nephelometry)	Light blocking
<b>Application area</b>	Drinking water, ultra-pure water, filtration management, filter monitoring, recording of filter breaches, effluent of membrane filtration	Drinking water, ultra-pure water, filter monitoring, effluent of membrane filtration

### Modular systems for the perfect solution

For the installation of process probes, we have designed a modular system. Standardised, coordinated systems and sensors for application specific components which complement each other perfectly.

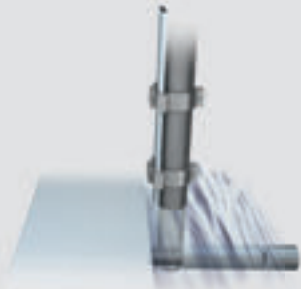
Only comprehensive measurement systems from a single source guarantee you maximum compatibility and application diversity.

- ▶ Installation in the tank, bypass, pipes or in containers
- ▶ Secure mount for light pH probes to complete analysers
- ▶ Movable, self adjusting suspension or stable attachment
- ▶ Devices made from stainless steel, plastic or special materials

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## MOUNTING HARDWARE



**Pole mounts**

- ▶ For installation on the tank edge (wall, floor or rail)
- ▶ For probes (incl. various mounting brackets). Can also be rotated and swivelled, adjustable depth of immersion
- ▶ For analysers and sample preparation systems
- ▶ For controllers (with protective cover)



**Chain mounts**

- ▶ For installation on the floor or rail
- ▶ With immersion tube made of stainless steel or CPVC



**Ball floats**

- ▶ For installation on the tank edge or rail
- ▶ For varying water levels, e.g. in SBR mode
- ▶ Can be rotated and swivelled
- ▶ With immersion tube made of stainless steel or CPVC



**Immersion and inline mounts**

- ▶ For open and closed tanks
- ▶ Wall mounting, flange connection or chain mount
- ▶ Flexible depth of immersion due to adjustable flange



**Bypass mounts**

- ▶ For applications in the bypass
- ▶ For complex structural requirements



**Inline mounts and retraction fittings**

- ▶ For installation in pipes with ball valve mount, welding connector or measuring tube (XL or VARIVENT, TSS only)
- ▶ For applications in pressure lines

# PARAMETERS

## OXYGEN

### Product

### LDO sc

### 5740 sc

#### Control is essential

The reliable measurement of pH, oxygen and conductivity forms the basis for process control in many applications.

With the continuous measurement of dissolved oxygen, the innovative optical oxygen sensors unlock significant, often untapped savings potential e. g. energy intensive aeration control at wastewater treatment plants.



**NEW**



#### Description

Digital, calibration-free, optical oxygen probe

Digital, galvanic oxygen probe



#### Benefits

- ▶ Minimal maintenance thanks to the sensor cap: no membrane, no electrolyte, no calibration
- ▶ Cost-effective aeration control via the drift-free optical measurement method
- ▶ Superior accuracy due to factory, temperature controlled 3D calibration
- ▶ 3 year warranty on probe

- ▶ Easy replacement of sensor head
- ▶ Low acquisition and operating costs
- ▶ Robust construction
- ▶ Can be used with chlorine dioxide disinfectant
- ▶ Can be used with rapid changes in concentration

#### Measuring range

0 ... 20.0 mg/L O<sub>2</sub>  
1 ... 200% saturation

0 ... 40 mg/L O<sub>2</sub>

#### Method

Optical via luminescence

Galvanic, Clark (nickel/lead)

#### Application area

Surface water, fish farming, drinking water, biological wastewater treatment, seawater

Surface water, drinking water, biological wastewater treatment


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PH/REDOX POTENTIAL			
EVITA OXY	pHD-S sc	1200-S sc	pH value / redox potential electrodes
			
Analogue, galvanic oxygen probe	Digital differential probe for pH value or redox potential with salt bridge	Digital combination probe for pH value or redox potential with gel electrolyte for contaminated media	Analogue glass electrodes, 12 mm diameter, also for high temperatures and pressures
			
<ul style="list-style-type: none"> <li>▶ Automatic calibration via tilting of the sensor</li> <li>▶ Quick to replace Clark electrode with long service life</li> <li>▶ High precision and immunity to interference</li> <li>▶ Self cleaning design</li> </ul>	<ul style="list-style-type: none"> <li>▶ Particularly long service life due to protected reference system, separated from the measurement medium</li> <li>▶ Less cleaning and calibration required</li> </ul>	<ul style="list-style-type: none"> <li>▶ High quality combination electrode</li> <li>▶ Dirt tolerant due to solid electrolyte and perforated membrane</li> <li>▶ Low maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▶ Large selection of electrodes with gel, liquid or polymer electrolyte</li> <li>▶ Various diaphragms for a diverse range of applications</li> <li>▶ Installation in retraction fittings, in the bypass or as an immersion sensor</li> <li>▶ Electrodes for high pressures and temperatures</li> <li>▶ ATEX certified version (optional)</li> </ul>
0 ... 50 mg/L O <sub>2</sub> 0 ... 500% saturation	0 ... 14 pH ±2,000 mV	0 ... 14 pH ±1,500 mV	0 ... 14 pH ±2,000 mV
Galvanic, Clark (gold/silver)	Potentiometric	Potentiometric	Potentiometric
Surface water, drinking water, biological wastewater treatment	Biological wastewater treatment, influent and effluent of wastewater treatment plants	Drinking water, process water, wastewater	Drinking water, ultra-pure water, process water, influent and effluent of wastewater treatment plants, sewer network monitoring

# PARAMETERS

## CONDUCTIVITY



Product	3798-S sc	37xx	34xx
			
<b>Description</b>	Digital, inductive conductivity probe for contact free measurement in heavily contaminated or aggressive media	Analogue, inductive conductivity probes for contact free measurement in heavily contaminated or aggressive media	Analogue, conductive conductivity probes for pure media or high temperatures and pressures with a low measuring range
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Long service life even in polluted media due to contact free measurement method</li> <li>▶ For high measurement values</li> <li>▶ Resistant against aggressive media due to the PEEK housing</li> </ul>	<ul style="list-style-type: none"> <li>▶ Long service life even in polluted media due to contact free measurement method</li> <li>▶ For high measurement values</li> <li>▶ Resistant against aggressive and corrosive media due to housing made of PP, PVDF, PEEK or PFA Teflon</li> <li>▶ Various process connections for selection</li> </ul>	<ul style="list-style-type: none"> <li>▶ High degree of accuracy and sensitivity for low measuring range</li> <li>▶ Suitable for high temperatures and pressures</li> <li>▶ Broad application spectrum due to numerous versions, e. g. in graphite or stainless steel</li> <li>▶ Determination of cell constants in accordance with ISO 7888/ ASTM D 1125</li> </ul>
<b>Measuring range</b>	250 $\mu$ S/cm ... 2,500 mS/cm	0.1 ... 2,000 mS/cm	0 ... 2,000 $\mu$ S/cm
<b>Method</b>	Inductive measurement	Inductive measurement	Conductive measurement
<b>Application area</b>	Polluted surface water, process monitoring, influent of wastewater treatment plants	Polluted surface water, process monitoring, heavily contaminated or aggressive media, influent of wastewater treatment plants	Raw water, drinking water, ultra-pure water, demineralisation, reverse osmosis, ion exchanger, cooling water and boiler water, process water

## PARAMETERS

### For use in special applications

The end result is crucial when treating for the assurance of processes and consent limits. Failure to comply comes at a high price.

We have a large selection of solutions for different applications. E.g. hardness in drinking water, chloride and silica in water treatment etc.

	HARDNESS	HARDNESS, ALKALINITY, FLUORIDE
Product	SP 510	POLYMETRON 8810
		
<b>Description</b>	Analogue hardness monitor with alarm contact	Analogue analyser for hardness, alkalinity or fluoride
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Robust simple measuring instrument with long service life for limit value monitoring</li> <li>▶ With relay output for alarm messages when the specified limit value is exceeded</li> <li>▶ For automatic, demand controlled regeneration systems for water softeners</li> <li>▶ Reliable monitoring via analysis every two minutes</li> </ul>	<ul style="list-style-type: none"> <li>▶ Versatile application due to numerous parameters and equipment variants</li> <li>▶ Can be retrofitted at any time due to the modular structure</li> <li>▶ Automatic temperature compensation for a high degree of accuracy</li> <li>▶ Sample flow switching for multiple sample flows (optional)</li> <li>▶ With 2 power outputs and 3 alarm relays</li> </ul>
<b>Measuring range</b>	Alarm trigger points 0.3 ... 100 mg/L Total hardness as CaCO <sub>3</sub>	<b>Total hardness:</b> 1 ... 500 mg/L CaCO <sub>3</sub> <b>Alkalinity:</b> 1 ... 500 mg/L CaCO <sub>3</sub> <b>Fluoride:</b> 0.1 ... 1,000 mg/L More on request
<b>Method</b>	Colorimetric	<b>Hardness:</b> complexometric titration <b>Alkalinity:</b> potentiometric pH titration <b>Fluoride:</b> ion-selective electrode
<b>Application area</b>	Effluent from water softeners, detection of hardness breaches	Water treatment, surface water, drinking water, wastewater

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# PARAMETERS

## AMMONIUM

### Product

### AMTAX sc

### AMTAX inter2

### Control, regulate and monitor nutrient parameters

Ammonium, nitrate and phosphate are key measured variables in advanced wastewater treatment. Reliably recording them forms the basis for all open and closed loop control concepts at municipal and industrial wastewater treatment plants.

Nutrient parameters also play a central role in the monitoring of surface water or in drinking water treatment. We deliver the optimal solution for your requirements with instrumentation that can be installed in-situ, or on-site.



### Description

Digital on-site analyser with gas sensitive electrode for the high precision determination of ammonium concentration directly at the tank

Analogue analyser for the high precision determination of ammonium concentration in accordance with DIN EN ISO

### Benefits

- ▶ High degree of accuracy due to selective GSE instrumentation
- ▶ Minimal supervision due to automatic cleaning, calibration and self diagnosis
- ▶ Ideal for installation directly on the tank edge, for fast reaction times in the closed loop control
- ▶ Weather proof housing for outdoor setup; transparent door for indoor setup (optional)
- ▶ Easy handling, analysis accessible at all times

- ▶ High precision for limit value monitoring
- ▶ Automatic cleaning and calibration for easy handling
- ▶ MODBUS, PROFIBUS (optional)

### Measuring range

0.02 ... 1,000 mg/L NH<sub>4</sub>-N

0.02 ... 80 mg/L NH<sub>4</sub>-N

### Method

Gas sensitive electrode (GSE)  
Sample preparation via FILTRAX or filter probe (refer to page 25)

Photometric with indophenol blue, derived from DIN 38406 E5  
Sample preparation via FILTRAX (refer to page 25)

### Application area



Surface water, drinking water, wastewater, activated sludge

Surface water, drinking water, wastewater, activated sludge, limit value monitoring in the effluent

**Would you like to know more?  
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	AMMONIUM, NITRATE	NITRATE	
<b>AISE sc</b>	<b>AN-ISE sc</b>	<b>NISE sc</b>	<b>NITRATAX sc family</b>
			
<b>NEW</b>	<b>NEW</b>	<b>NEW</b>	
Digital, ion-selective probe for the determination of ammonium concentration directly in the medium	Digital, ion-selective probe for the simultaneous determination of the ammonium and nitrate concentration directly in the medium	Digital, ion-selective probe for the determination of nitrate concentration directly in the medium	Digital, optical probes for the high precision determination of nitrate concentration directly in the medium
<ul style="list-style-type: none"> <li>▶ Calibration-free probe with automatic potassium compensation</li> <li>▶ Easy handling and low maintenance due to CARTRICAL sensor cartridge</li> <li>▶ Particularly cost-effective in terms of installation and operation, even for small wastewater treatment plants</li> </ul>	<ul style="list-style-type: none"> <li>▶ Calibration-free combination probe with automatic and simultaneous compensation of potassium and chloride</li> <li>▶ Easy handling and low maintenance due to CARTRICAL PLUS sensor cartridge with five electrodes</li> <li>▶ Secure data transfer during commissioning with RFID technology</li> <li>▶ Particularly cost-effective in terms of installation and operation, even for small wastewater treatment plants</li> </ul>	<ul style="list-style-type: none"> <li>▶ Calibration-free probe with automatic chloride compensation</li> <li>▶ Easy handling and low maintenance due to CARTRICAL sensor cartridge</li> <li>▶ Particularly cost-effective in terms of installation and operation, even for small wastewater treatment plants</li> </ul>	<ul style="list-style-type: none"> <li>▶ High degree of accuracy due to direct UV measurement, without cross sensitivities, ideally suited to statutory limit value monitoring</li> <li>▶ Broad application spectrum, e.g. in sludge due to turbidity compensation and self cleaning</li> <li>▶ Minimal operating costs due to reagent-free method, without electrode</li> <li>▶ Minimal maintenance due to factory calibration</li> </ul>
0 ... 1,000 mg/L NH <sub>4</sub> -N	0 ... 1,000 mg/L NH <sub>4</sub> -N 0 ... 1,000 mg/L NO <sub>3</sub> -N	0 ... 1,000 mg/L NO <sub>3</sub> -N	<b>NITRATAX plus sc:</b> 0.1 ... 100 mg/L NO <sub>3</sub> -N <b>NITRATAX clear sc:</b> 0.5 ... 20 mg/L NO <sub>3</sub> -N <b>NITRATAX eco sc:</b> 1.0 ... 20 mg/L NO <sub>3</sub> -N
Potentiometric with ion-selective electrodes (ISE)	Potentiometric with ion-selective electrodes (ISE)	Potentiometric with ion-selective electrodes (ISE)	UV absorption measurement
Municipal wastewater, monitoring of nutrient elimination, open loop control of intermittent nitrification	Municipal wastewater, simultaneous nitrification/denitrification process, intermittent process, SBR processes	Municipal wastewater, monitoring of nutrient elimination, open loop control of the dosage of external carbon sources and intermittent nitrification	Drinking water, wastewater, effluent denitrification tank, effluent aeration tank, effluent of wastewater treatment plants, activated sludge

# PARAMETERS

	ORTHOPHOSPHATE	TOTAL PHOSPHORUS, ORTHOPHOSPHATE
Product	PHOSPHAX sc	PHOSPHAX sigma
		
<b>Description</b>	Digital on-site analyser with weather proof housing for the high precision determination of orthophosphate concentration directly at the tank	Analogue analyser for the high precision determination of total phosphorus concentration and orthophosphate concentration in accordance with DIN EN ISO
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ High degree of accuracy due to precision photometric instrumentation</li> <li>▶ Minimal reagent consumption</li> <li>▶ Ideal for installation directly at the tank edge, for fast reaction times in the closed loop control</li> <li>▶ Weather proof housing for outdoor setup; transparent door for indoor setup (optional)</li> <li>▶ Easy handling, analysis accessible at all times</li> <li>▶ Reliable results due to comprehensive self diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>▶ High precision instrumentation including digestion for the limit value monitoring of total phosphorus</li> <li>▶ Versatile application as total phosphorus and orthophosphate measurement are provided in one instrument</li> <li>▶ Rapid availability of measurement values within 10 minutes incl. digestion</li> <li>▶ MODBUS (optional), PROFIBUS (optional)</li> </ul>
<b>Measuring range</b>	0.05 ... 50.0 mg/L PO <sub>4</sub> -P	0.01 ... 5.0 mg/L P <sub>tot</sub> 0.01 ... 5.0 mg/L PO <sub>4</sub> -P
<b>Method</b>	Photometric with vanadate-molybdate (yellow method) Sample preparation via FILTRAX or filter probe (refer to page 25)	Photometric with phosphor-molybdenum blue, derived from DIN 38405 D11 Sample preparation via SIGMATAX 2 (refer to page 25)
<b>Application area</b>	Drinking water, wastewater	Drinking water, cooling water, wastewater, limit value monitoring in the effluent




## Well prepared

Correct sampling and low maintenance sample preparation are essential requirements for the reliable operation of your process instruments.

**Would you like to know more? Simply call or click! You can find out where and how on the back of this catalogue.**



## SAMPLE PREPARATION

	AMMONIUM, NITRATE, PHOSPHATE		TOTAL PHOSPHORUS, TOC
Product	FILTRAX / FILTRAX eco	Filter probe	SIGMATAX 2
			
<b>Description</b>	Automatic sampling and sample preparation system for supplying up to three process instruments with a solid free sample	Self cleaning membrane filter probe for SC analysers	Sampling probe and control unit for sample delivery and homogenisation
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Supplies 1–3 instruments</li> <li>▶ For all AMTAX, PHOSPHAX or NITRATAX in the bypass</li> <li>▶ Low maintenance in-situ sample filtration with automatic air bubble cleaning</li> </ul>	<ul style="list-style-type: none"> <li>▶ For AMTAX sc and PHOSPHAX sc analysers</li> <li>▶ Low maintenance in-situ membrane filtration with air bubble cleaning</li> <li>▶ Installation in tanks or channels</li> </ul>	<ul style="list-style-type: none"> <li>▶ For PHOSPHAX sigma and TOCTAX analysers</li> <li>▶ Enables the reliable measurement of the representative original sample incl. solids</li> </ul>
<b>Measuring range</b>	∕	∕	∕
<b>Method</b>	Membrane filtration	Membrane filtration	Homogenisation with ultrasound
<b>Application area</b>	Surface water; influent, effluent, aeration of municipal or industrial wastewater treatment	Surface water; influent, effluent, aeration of municipal or industrial wastewater treatment	Effluent from biological wastewater treatment, particle sizes <0.5 mm

## PARAMETERS

### TOC






#### Overview of sum parameters



Water and wastewater flows generally contain an abundance of substances. The individual analysis of each substance is not possible.

You need to determine the organic load with the help of sum parameters such as COD, BOD, TOC and SAC254 (spectral absorption coefficient).

TOC in accordance with EN 1484 and SAC in accordance with DIN 38404 C3 are ideal for the continuous measurement of the organic load.

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back of this catalogue.**

Product	BIOTECTOR B7000	TOCTAX
	 	
<b>Description</b>	<p>Analogue analyser for the determination of the total organic carbon via oxidation in water with particles up to 2 mm in size</p>  	<p>Analogue analyser for the determination of the total organic carbon in accordance with DIN EN ISO standard by means of the expulsion method in water with particles up to 0.5 mm in size</p>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Ideal for heavily polluted sample flows, for high particle concentrations, fat and oil contents and salt loads</li> <li>▶ Monitors up to six sample flows</li> <li>▶ Sample preparation not required</li> <li>▶ Determination of total nitrogen (optional) or total phosphorus (optional)</li> <li>▶ ATEX-certified version (optional)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ideal for effluent monitoring of municipal wastewater treatment plants</li> <li>▶ Low maintenance due to integrated self cleaning</li> <li>▶ MODBUS (optional), PROFIBUS (optional)</li> <li>▶ Precise measurement values due to ultrasonic homogenisation with SIGMATAX 2 (refer to page 25)</li> </ul>
<b>Measuring range</b>	<p>0 µg/L ... 100 g/L C 0 mg/L ... 100 g/L N (optional) 0 mg/L ... 100 g/L P (optional)</p>	<p>1.0 ... 100 mg/L C</p>
<b>Method</b>	<p><b>TOC:</b> infrared measurement of CO<sub>2</sub> following oxidation; <b>TN:</b> photometric determination of NO<sub>3</sub> following oxidation; <b>TP:</b> photometric with vanadate-molybdate method (yellow method)</p>	<p>Infrared measurement of CO<sub>2</sub> following wet chemical digestion, equivalent to DIN EN 1484</p>
<b>Application area</b>	<p>Surface water; industrial process water; influent of wastewater treatment plants; effluent of seawater desalination plants</p>	<p>Cooling water and wastewater incl. solids up to 0.5 mm in size; effluent measurement in municipal wastewater treatment plants with SIGMATAX 2 homogenisation</p>

SAC254	OIL IN WATER
UVAS plus sc	FP 360 sc
	
<p>Digital UV probe for the reagent-free determination of the organic load via the spectral absorption coefficient (SAC) in the medium or in the bypass</p>	<p><b>NEW</b></p> <p>Digital UV fluorescence probe for the reagent-free determination of mineral oil impurities directly in the medium or in the bypass</p>
<ul style="list-style-type: none"> <li>▶ Reliable measurement values immediately available due to direct UV measurement</li> <li>▶ SAC254 as a measure for the organic load, correlatable to COD or TOC</li> <li>▶ Easy handling</li> <li>▶ Self cleaning probe, even for difficult environmental conditions</li> <li>▶ Particularly low operating costs as reagent-free and low maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▶ Detects even the smallest traces of oil</li> <li>▶ Long-term stable and reliable</li> <li>▶ Easy to clean, optionally with compressed air cleaning nozzle</li> <li>▶ Robust probes made of stainless steel or titanium, also for aggressive media</li> </ul>
0.01 ... 3,000 m <sup>-1</sup> SAC254	0 ... 5,000 µg/L (PAH*) 0.1 ... 150 mg/L (oil*) *based on calibration standard
UV absorption measurement (2 beam method)	UV fluorescence measurement method for polycyclic aromatic hydrocarbons (PAH)
Raw water, drinking water, process monitoring, influent and effluent of wastewater treatment plants	Surface water; process water in oil refineries, influent and effluent of wastewater treatment plants



## PARAMETERS

### CHLORINE FREE/TOTAL

#### Product

#### CL17

#### CLF-10 sc / CLT-10 sc

### Successful disinfection

Chlorine, ozone and chlorine dioxide are common agents used for, the disinfection of drinking water, hygiene in swimming pools and for industrial cleaning processes. They destroy pathogenic bacteria, fungi and viruses and permanently prevent them from multiplying.

Careful analysis is not only advisable for financial reasons, but it also essential due to the considerable potential for danger posed by the disinfectants. HACH LANGE has a complete range of products for disinfection analysis.



#### Description

Analogue, photometric analyser for the determination of free or total chlorine in accordance with DIN EN ISO

Digital, amperometric sensors for the reagent-free determination of free or total chlorine

#### Benefits

- ▶ Precise, automatic measuring instrument with minimal maintenance
- ▶ Maximum possible acceptance and reliability due to photometric DPD method in accordance with DIN 38408
- ▶ Factory calibrated, no re-calibration required in dynamic processes

- ▶ Measurement in real time to allow fast response
- ▶ Integrated pH compensation without additional pH electrode
- ▶ Very stable 3 electrode sensor
- ▶ Full accessories, e.g. automatic cleaning system and acidification unit (optional)

#### Measuring range

0.03 ... 5 mg/L Cl<sub>2</sub>

0.03 ... 10 mg/L Cl<sub>2</sub>

#### Method

Photometric with DPD (N,N-diethyl-p-phenylenediamine) in accordance with DIN 38408




Amperometric

#### Application area

Drinking water treatment, food and drink industry, industrial feed and process water, heating and cooling systems, filter systems, swimming pools

Drinking water treatment, food and drink industry, heating and cooling systems, swimming pools, wastewater

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CHLORINE FREE	CHLORINE DIOXIDE	OZONE
9184 sc	9187 sc	9185 sc
		
<p>Digital, amperometric sensor for the reagent-free determination of free or active chlorine</p>	<p>Digital, amperometric sensor for the reagent-free determination of chlorine dioxide</p>	<p>Digital, amperometric sensor for the reagent-free determination of ozone</p>
<ul style="list-style-type: none"> <li>▶ Low operating costs due to reagent-free determination</li> <li>▶ Broad application spectrum due to large measuring range and low detection limit</li> <li>▶ Reliable methodology without interferences with chloramines</li> <li>▶ Adaptable: pH compensation for the determination of total free chlorine (optional), automatic cleaning system (optional), acidification unit (optional)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Low operating costs due to reagent-free determination</li> <li>▶ Ideal for the sensitive detection of low loads via the low detection limit</li> <li>▶ Reliable results independently of the pH value of the medium thanks to direct determination of chlorine dioxide due to the selective membrane</li> <li>▶ No interferences with chlorine, bromine and hydrogen peroxide</li> </ul>	<ul style="list-style-type: none"> <li>▶ Low operating costs due to reagent-free determination</li> <li>▶ Independent of pH value, suitable for the sensitive detection of low loads via the low detection limit</li> <li>▶ Ideal for samples with low conductivity</li> <li>▶ No interferences with bromine, chloramine, chlorine dioxide and hydrogen peroxide</li> </ul>
0.005 ... 20 mg/L as HOCl	0.005 ... 2 mg/L ClO <sub>2</sub>	0.005 ... 2 mg/L O <sub>3</sub>
Amperometric	Amperometric	Amperometric
Drinking water treatment, chlorination applications, desalination systems, cooling water	Drinking water treatment	Drinking water treatment

**NEW**

**OPTIMISATION SOLUTIONS**

**NITROGEN ELIMINATION**

Product

W.T.O.S. N/DN-RTC

W.T.O.S. N-RTC

**Automation in wastewater treatment plants**

Requirements for the cost efficient and resource conserving operation of your wastewater treatment plant are growing constantly.

It has long been the case at many sites, that open or closed loop control is also carried out in addition to measurement. The trend is towards forward looking, automated operation.

With W.T.O.S. (Water Treatment Optimisation Solutions), you receive standardised loop control components for municipal wastewater treatment plants. The real time controllers (RTC) offer a reliable closed/open loop control based on verified measurement values. Parameterisation is performed via the SC 1000 Digital Controller, your control system or remotely via GPRS on request.



**Description**

**Nitrification / denitrification:**  
Open and closed loop control unit for the load dependent setting of nitrification and denitrification times

**Nitrification:**  
Open and closed loop control unit for the ammonium load dependent setting of oxygen concentration

**Benefits**

- ▶ Reliable compliance with nitrogen effluent values with optimal energy use due to exact, load dependent aeration
- ▶ Based on verified ammonium and nitrate values
- ▶ The W.T.O.S. N/DN-RTC can be optionally equipped with an additional closed loop controller for setting the dissolved oxygen concentration in the aeration tank.

- ▶ Reliable compliance with nitrogen effluent values with optimal energy use due to exact, load dependent aeration
- ▶ Based on verified ammonium values
- ▶ The W.T.O.S. N-RTC can be optionally equipped with an additional closed loop controller for setting the dissolved oxygen concentration in the aeration tank.

**Input**

Ammonium, nitrate, dissolved oxygen

Ammonium, dissolved oxygen, flow volume

**Output**

Aeration time, aeration intensity

Aeration intensity, target oxygen value





**Application area**

Wastewater treatment plants with intermittent aeration or in sequencing batch reactor mode (SBR)

Wastewater treatment plants with continuously aerated aeration tanks, e. g. with upstream denitrification





PHOSPHATE ELIMINATION		SLUDGE MANAGEMENT	
W.T.O.S. P-RTC	W.T.O.S. SRT-RTC	W.T.O.S. ST-RTC	W.T.O.S. SD-RTC
			
<p><b>Phosphate elimination:</b> Open and closed loop control unit for load dependent, chemical phosphate elimination based on the flow volume and the ortho-phosphate concentration</p>	<p><b>Sludge age:</b> Open and closed loop control unit for setting the sludge age depending on the temperature and wastewater load</p>	<p><b>Sludge thickening:</b> Open and closed loop control unit for the optimisation of polymer dosage in mechanical sludge thickening</p>	<p><b>Sludge dewatering:</b> Open and closed loop control unit for the optimisation of polymer dosage in mechanical sludge dewatering</p>
<ul style="list-style-type: none"> <li>▶ Reliable compliance with phosphate effluent values with sparing use of precipitants via precise, load dependent dosage</li> <li>▶ The W.T.O.S. P-RTC real time controller is used for both open and closed loop control of precipitant dosage. Depending on the situation, it observes current measurement values or retrieves stored hydro-graphs.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reliable compliance with required sludge age based on verified measurement values</li> <li>▶ Automatic setting of the optimal sludge age depending on the load and the temperature</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reliable compliance with required dry matter content in the thickened sludge due to load dependent polymer dosage and adjustment of influent volume</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reliable compliance with required dry matter content in the dewatered sludge due to load dependent polymer dosage and adjustment of influent volume</li> </ul>
Orthophosphate, flow volume	Dry matter content of recycled sludge of aeration tank, flow volume, temperature, turbidity of effluent	Dry matter content influent and effluent, volume flows	Dry matter content influent, centrate, flow volumes
Precipitant volume	Sludge extraction	Polymer volume, influent volume of sludge thickening	Polymer volume, influent volume sludge dewatering
Wastewater treatment plants with chemical-physical phosphorus elimination	Continuously flowed through wastewater treatment plants with suspended biomass	Wastewater treatment plants with mechanical sludge thickening	Wastewater treatment plants with sludge dewatering

# PARAMETERS




## PORTABLE SAMPLERS

### Precise analysis begins with accurate sampling

The automatic sampler is the key connection between the measurement point and the laboratory. With the implementation of the ISO 5667 standard, representative samples became indispensable for exact analysis and reporting to authorities.

Choose from: portable or stationary samplers; plastic and stainless steel housings; pressure-vacuum and peristaltic principals and numerous container options in plastic and glass.

**Would you like to know more?  
Simply call or click! You can find out where and how on the back of this catalogue.**

Product	BÜHLER 2000	SIGMA SD900
		
<b>Description</b>	Portable sampler with pressure-vacuum principle for precise sampling, in accordance with ISO 5667	Portable sampler with peristaltic principle for routine sampling, in accordance with ISO 5667
		
<b>Benefits</b>	<ul style="list-style-type: none"> <li>▶ Maximum volume accuracy</li> <li>▶ Robust housing made of PE</li> <li>▶ Insulated container for passive sample cooling; active independently regulated compressor cooling (optional)</li> <li>▶ Easy to clean</li> <li>▶ Flexible for changing monitoring tasks due to numerous bottle options</li> <li>▶ Remote access to programming and data storage (optional)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Reduced maintenance due to spring loaded peristaltic pump</li> <li>▶ Reliable sample conservation via active compressor cooling</li> <li>▶ Intuitive user guidance, fast programming and updates via computer</li> <li>▶ SDI 12 connection for triggering the sampling control (optional)</li> </ul>
<b>Sample volume</b>	20 ... 350 mL	10 ... 10,000 mL
<b>Method</b>	Pressure-vacuum principle; time, volume or event proportional sampling	Peristaltic principle; time, volume or event proportional sampling
<b>Application area</b>	Monitoring of drinking water, surface water and indirect dischargers, sewers, rainwater and overflow tanks, influent and effluent of wastewater treatment plants	Monitoring of drinking water, surface water and indirect dischargers, sewers, rainwater and overflow tanks, influent and effluent of wastewater treatment plants

\*Applied for

STATIONARY SAMPLERS

BÜHLER 4010

SIGMA SD900 AWRS



Stationary sampler with pressure-vacuum principle for maximum volume accuracy, in accordance with ISO 5667

Stationary sampler with peristaltic principle for standard applications, in accordance with ISO 5667



- ▶ Maximum volume accuracy
- ▶ High performance cooling system (MCERTS certified)
- ▶ Particularly flexible due to a variety of bottle variants, housing materials and dosage options; up to double door measuring station with SC 1000 Controller
- ▶ PROFIBUS, MODBUS and GSM modem (optional)
- ▶ Water rinsing (optional)

- ▶ Suitable for very low and very high ambient temperatures
- ▶ Reduced maintenance due to spring loaded peristaltic pump
- ▶ Intuitive user guidance, fast programming and updates via computer
- ▶ SDI 12 connection for triggering sampling control (optional)

20 ... 350 mL  
(optional: up to 500 mL)

10 ... 10,000 mL

Pressure-vacuum principle; time, volume, flow or event proportional sampling

Peristaltic principle; time, volume or event proportional sampling

Monitoring of drinking water, surface water and indirect dischargers, sewers, rainwater and overflow tanks, influent and effluent of wastewater treatment plants

Monitoring of drinking water, surface water and indirect dischargers, sewers, rainwater and overflow tanks, influent and effluent of wastewater treatment plants

**Flow measurement**

Flow is a key reference variable in water management:

- ▶ As a planning basis for new plant facilities and structures in the sewer network
- ▶ As an assessment basis for wastewater charges
- ▶ For open and closed loop control
- ▶ For plant optimisation
- ▶ For detecting faults

Flow measurements are performed in fully filled pipes and partly filled Venturi flumes.

We have a comprehensive range of technical options and the right solution for your application.

**Product**

Flow measurement via water level with Venturi fittings

**Description**

Flow measurement via cross section constriction and flow transition

**Benefits**

- ▶ Broad range of Venturi fittings
- ▶ Ready-made Venturi flumes
- ▶ Venturi throat
- ▶ Trapezoidal throated flumes for broad measuring range dynamics
- ▶ Sole plate for deposit free measurement sections
- ▶ In accordance with DIN EN ISO

**Measuring range**

From 1 L/s  
Max. 9 m<sup>3</sup>/h

**Method**

Sub critical to super critical flow transition is enforced by defined constriction.

**Application area**

All liquid media

**Measurement point**

Partly filled Venturi flumes in all applications without backwater

**Would you like to know more?**  
Simply call or click! You can find out where and how on the back of this catalogue.



## APPLICATIONS

## FLOW

Measurement technique	Venturi	Weir	Ultrasonic reflection measurement (Doppler)	Magnetic inductive measurement	Clamp-on measurement	Runtime difference measurement (transit time)	Magnetic sensor
							
Sewer network <sup>1</sup>	●	○	●	○	○	●	○
Wastewater treatment plant <sup>2</sup>	●	●	●	●	●	●	●
Roads <sup>3</sup>	●	●	●	○	○	●	●
Drinking water <sup>4</sup>	○	●	○	●	●	●	●
Calculating charges <sup>5</sup>	●	●	○	●	●	●	○
Backwater <sup>6</sup>		○	●	●	●	●	●
Open channel <sup>7</sup>	●	○	●			●	●
Fully filled pipe <sup>8</sup>			●	●	●	●	●
Volumes <5 L/s <sup>9</sup>	●	●	○	●	●	○	○
Local calibration <sup>10</sup>			●				●
Remote data transmission, protocols	●	●	●	●	●	●	●

● Suitable

○ Suitable for specific applications

<sup>1</sup> Mostly part filled Venturi flumes, particularly low maintenance instrumentation, no facilitation of deposits, high measuring range dynamics

<sup>2</sup> Fully and partly filled Venturi flumes, clean water, fats, sludge

<sup>3</sup> Partly filled Venturi flumes, sometimes with backwater, little calibration possibility, fewer solids, high measuring range dynamics

<sup>4</sup> Fully and partly filled Venturi flumes, clean water, few reflection particles, frequent backwater

<sup>5</sup> High degree of accuracy, low interference sensitivity

<sup>6</sup> Records the flow velocity

<sup>7</sup> Variable flowed through area, with recording of water level

<sup>8</sup> Dependent on the flow velocity

<sup>9</sup> Exact detection of even the smallest quantities

<sup>10</sup> Calibration to the local hydraulic situation

**NEW**





**PARAMETERS**

**LEVEL**







**Level measurement**

Level is the most common measurement variable in water management.

We have a comprehensive range of technical options and the right solution for your application.

Measurement technique		Ultrasound	Radar	Vibration fork	Float	Pressure cable sensor
						
Applications	Sewer network	●	●	●	○	○
	Wastewater treatment plant	●	●	●	●	●
	Roads	●	●	●	●	●
	Drinking water	●	●	●	●	●
Media	Liquid	●	●	●	●	●
	Foam		○			●
	Sludge	●	●	●	○	●

Would you like to know more?  
Simply call or click! You can find out where and how on the back of this catalogue.

					WEATHER	OTHER		
Pressure screw sensor	Bubbler	Capacitive	Conductive	Magneto resistive	Rain gauge	Weather station	Temperature	Air volume
								
○	●	●	○		●	●	●	
●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	
●	●	●	●	●			●	
●	●	●					○	
●		●	○				●	

● Suitable

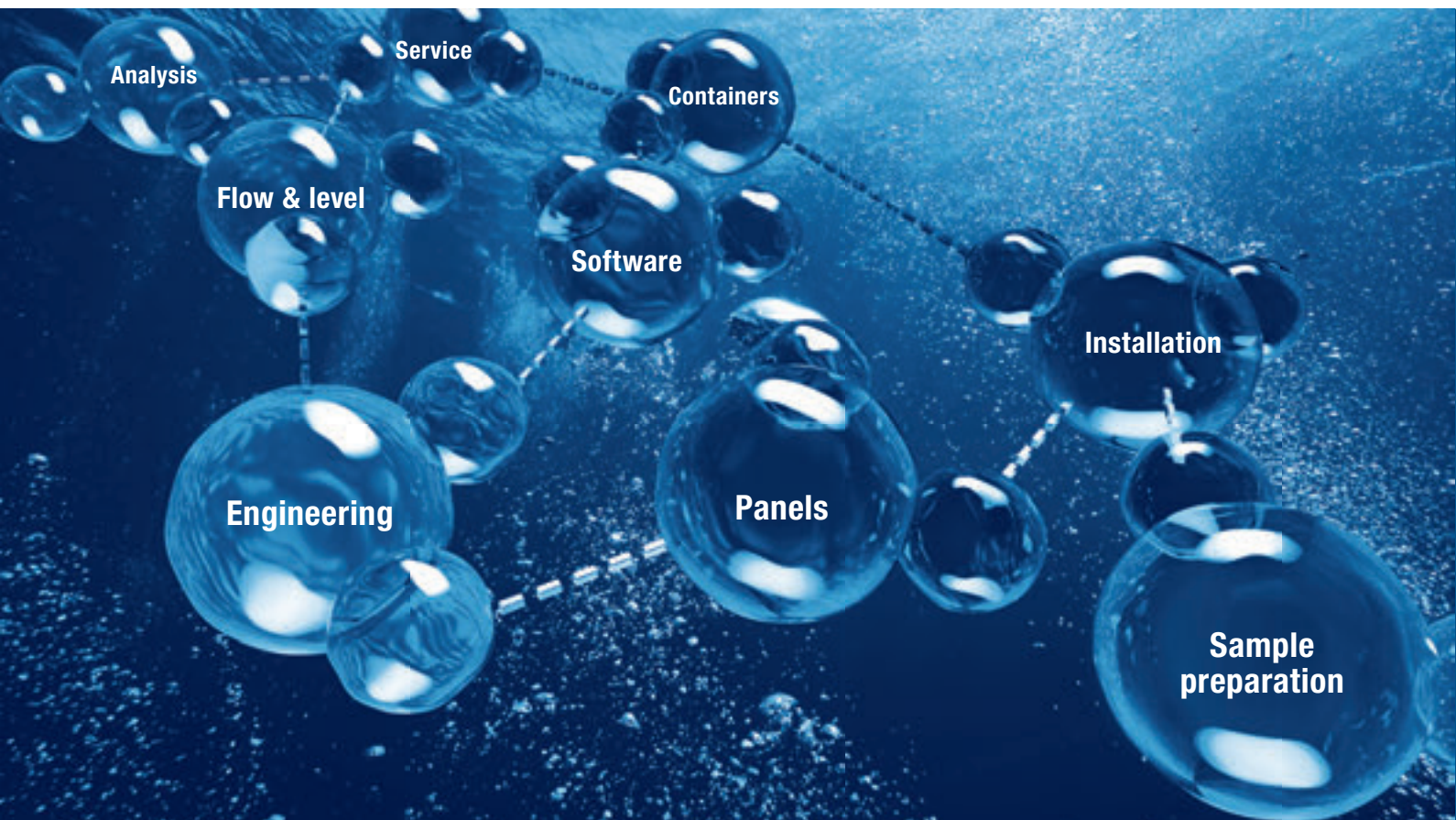
○ Suitable for specific applications

# System solutions: Connect and start measuring!

Do you want to construct, upgrade or modernise a plant? Our experienced engineers will find the right solution and will be available throughout the project phase.

With HACH LANGE, you have access to a high performance network: dedicated subsidiaries throughout Europe and co-operation with strong partners. You have an expert by your side during every project phase:

- ▶ In determining the right measurement points
- ▶ In choosing the right instruments for your application
- ▶ In planning feed lines, hardware, cabling, flow unit etc.
- ▶ In formulating the requirements profile for the application, parameter and instrument
- ▶ In deciding on the optimal communication and energy supply
- ▶ In choosing the right design; cabinet panel, wall panel, mobile panel, control house, container, transporter or trailer







Sample panels for drinking water and wastewater, monitoring of surface water, desalination plants and sewer network management etc.

### Construct with HACH LANGE

“I now have systems that are adapted to my needs. I have set contacts to liaise with, who advise me during the various project phases.”

- ▶ Instrument service  
Page 40–41
- ▶ Laboratory analysis  
Page 42–43

### Do you have specific requirements? Ask us about a solution.

Mounted on a panel, in a trailer, in a container or as a turn-key monitoring station. With system solutions from HACH LANGE, we provide you with coordinated components. Your system is individually planned and constructed. The equipment covers all your required parameters.

Your project is safe in our hands, whether it be a local or international project. Your complete system is mounted on a panel and tested thoroughly. At the target site, you just connect the panel and start measuring!

# Your instrumentation deserves the best care

We understand increased uptime and predictable costs are important to you. With our various service options, you can benefit from decades of practical experience and a qualified team of service engineers (certified DIN EN 13306).

We commission the instrumentation and train your employees thoroughly. However, in the event of a fault, you can contact our qualified service engineers. You will receive prompt assistance via remote diagnostics or a visit on-site.

We offer various service options: from one off inspections or service packages with a warranty extension, to a complete tailored service. Whatever you choose, you will always receive an inspection report in accordance with DIN ISO!





### Test service for field bus networks

Optimise your field bus or SC 1000 network with the help of our qualified experts. Special instruments test every interface, regardless of instrument type and manufacturer.

The current network performance along with all instrument addresses are documented in the inspection report. HACH LANGE Service Engineers can train the operators on the network (if required) and inform them of the opportunities for optimisation.

### Reliable operation with HACH LANGE

"I can request a service visit on my site. I chose the service option that suited me. I am kept informed about the status of my plant at all times."

► SC Controller  
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The SC 1000 Digital Controller notifies the operating personnel via email or text message. Status, warning and error messages can be sent to the HACH LANGE service centre for remote diagnostics.



# Co-ordination in the laboratory and in the process

With HACH LANGE, you receive laboratory analysis and process instrumentation from a single source – offering expertise from development to consulting. Our focus is on user safety, user friendly instrumentation and most importantly on quality.

Laboratory and process instruments use the same methods. Values are directly comparable with each other. The online sensors are checked by the laboratory instruments. Saving time, money and providing additional reliability.

Behind the success of HACH LANGE laboratory systems is a clear concept: water analysis as a complete solution. From sampling and sample preparation to measurement, documentation and quality control.

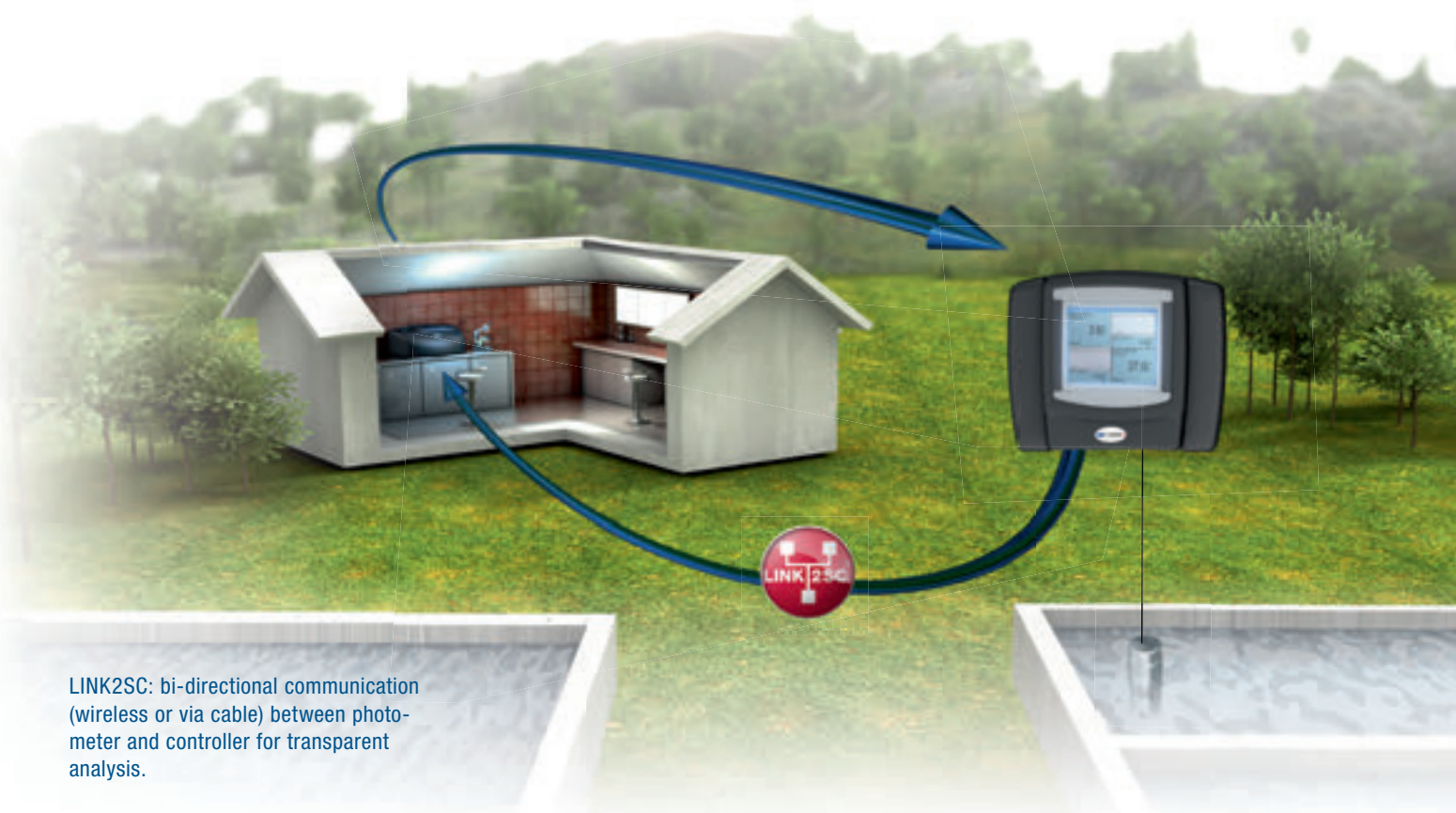
The sophisticated systems are comprised of instrumentation, consumables, reagents, and accessories for over 100 parameters.

Proven reagents, pre-dosed with high precision, greatly simplify the analysis. The simple handling rules out several error sources from the start.

RFID technology, the latest innovation, brings a new level of reliability to laboratory analysis for the traceability of samples and quality control.







### Confidence from HACH LANGE

"I obtain competent solutions for process and laboratory analysis from a single source. I save on training costs thanks to the standardised, intuitive operation of the instruments. I obtain verified results for my business."

### Practical solutions for use in the laboratory and in the field

- ▶ From a portable single parameter colorimeter or the spectrophotometer; to the laboratory robot for serial analysis
- ▶ Reagents for all important parameters from ammonium to zinc; from rapid screening tests to standard compliant analysis; with sample preparation and quality assurance
- ▶ Electrochemical instruments, electrodes and standard solutions
- ▶ Turbidity instruments in accordance with DIN EN ISO or USEPA, long-term stable prepared standards
- ▶ Fully equipped portable environmental laboratories



Turbidity instruments in accordance with DIN EN ISO or USEPA, benchtop or portable



Single and multi-parameter instruments for pH, conductivity, oxygen, redox and many more

[WWW.HACH-LANGE.COM](http://WWW.HACH-LANGE.COM)

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