

Introduction

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Laboratory analysis

Chapter

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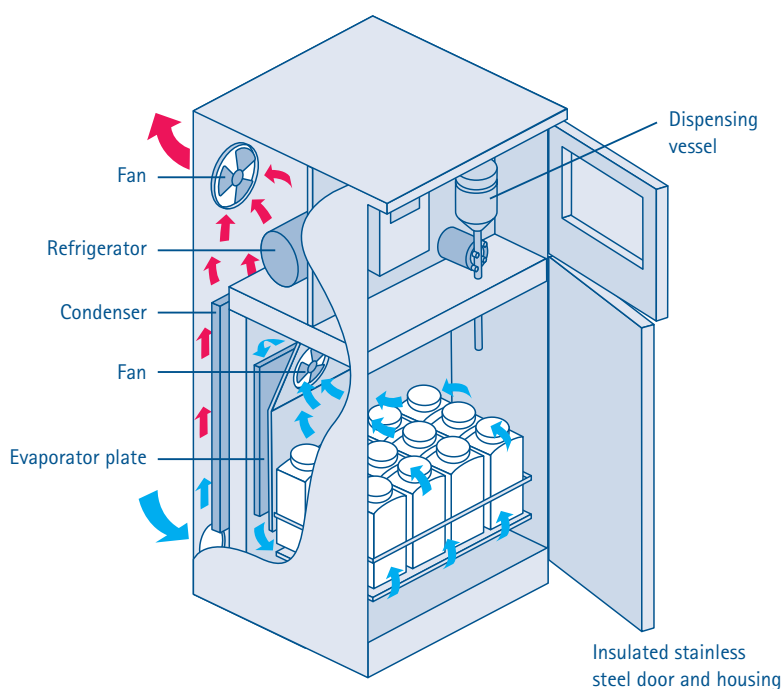
Fully automatic stationary and portable samplers

HACH LANGE's extensive range of samplers includes portable and stationary systems using pressure/vacuum or peristaltic technology. Versatile dispensing units for time, volume, flow and event-based sampling. All HACH LANGE samplers are ideal for use in sewage treatment and industrial plants and for monitoring surface waters. Outstanding technical knowledge, excellent quality and a comprehensive range of service packages ensure reliable operation in standard applications as well as under difficult conditions. Intelligent design optimises handling during operation, maintenance and service.

	PORTABLE SAMPLERS	STATIONARY SAMPLERS
Pressure/vacuum technology	 BÜHLER 1029 – flexible	 BÜHLER 4010 – weather resistant
	 XIAN 1000 – weather resistant	 BÜHLER 1027 – wall mountable
Peristaltic technology	 SIGMA 900/900 MAX – compact	 SIGMA 900/900 MAX – weather resistant with high-speed pump

Pressure/vacuum sampler

- All-weather housing in V2A or V4A stainless steel
- Flexible sampling: time, volume, event and flow-based
- Exact sample volumes with pressure/vacuum technique
- Excellent operational reliability with patented modules
- Temperature control system maintains samples at +4 °C



Optimal cooling of up to 24 sample bottles through effective air circulation

Individually configured, ideal for demanding sampling

- The system can be rinsed with water instead of air when samples have high solids content
- Integration of probes for pH, conductivity, oxygen and redox
- Self-emptying systems, e.g. for river or outflow monitoring

Representative samples conforms with ISO 5667

The pressure/vacuum samplers function in conformity with ISO 5667. Samples can be used for consent verification. Until then the sample is kept cool, thus preventing biological and chemical changes from occurring. The system is rinsed after each sampling operation to ensure that no cross-contamination occurs.

→ For the technical data of the sampler with pressure/vacuum technique: see page 94

Peristaltic samplers

- Plastic housing for indoor or outdoor setup
- Versatile controllers for standard and demanding sampling
- Flexible sampling: time, volume, flow and event-based
- Temperature control system maintains samples at +4 °C
- Optional configuration for pH, conductivity, O₂, redox, flow



Portable SIGMA 900 MAX sampler



All weather version of the SIGMA 900/900 MAX stationary sampler

The right controller for your needs: 900 or 900 MAX

Both SIGMA controllers can be used with stationary samplers incorporating cooling systems for indoor or outdoor setup or with portable samplers. The SIGMA 900 controller can be relied on for traditional sampling tasks, while the SIGMA 900 MAX is ideal for demanding monitoring tasks.

The SIGMA 900 MAX controller—high quality, latest technology

The quality of the 900 MAX controller is reflected in more than just the clear display for graphic and tabular data output:

- Event-based sampling for pH, conductivity, O₂, redox or flow
- Simple, flexible programming
- Separation of out-of-limits samples

Reliable and flexible sampling conforms with ISO 5667

The high-speed pump fills as many as 24 sample bottles in time, volume, flow or event mode. The system is purged before and after sampling and the sample is kept cool at 4 °C. In practice this means:

- Flexible working
- No cross-contamination
- No chemical and biological changes

→ For the technical data of the peristaltic SIGMA 900 MAX samplers: see next page

WW Samplers—an overview



Comprehensive: The BÜHLER 4110 measuring station combines the stationary sampler with digital SC 100 controllers for up to four sensors.



Ingenious: The pressure/vacuum valve system of the BÜHLER sampler functions without any contact with the sample, reducing wear parts.



Well designed: The pull-out service console in the BÜHLER samplers ensures convenient maintenance.

Stationary samplers—an overview

MODEL	BÜHLER 4010	BÜHLER 4110	BÜHLER 4210	BÜHLER 4410	BÜHLER 1027	XIAN 1000	BÜHLER 1029	SIGMA 900 (indoor)	SIGMA 900 MAX (indoor)	SIGMA 900 (outdoor)	SIGMA 900 MAX (outdoor)
Version											
Portable (P)/Stationary (S)	S	S	S	S	S	P	P	S	S	S	P
Technique											
Pressure/vacuum system	•	•	•	•	•	•	•				
Peristaltic								•	•	•	•
Sampling											
Time, volume, event-based	•	•	•	•	•	•	•	•	•	•	•
Flow-based	•	•		•			•		•*	•	•*
Temperature-controlled	•	•	•	•	Optional		Optional	•	•	•	•
Composite sample	•	•	•	•	•	•	•	•	•	•	•
Discrete sample	•	•	•	•		•	•	•	•	•	•
Housing											
Plastic						•	•	•	•	•	•
Stainless steel	•	•	•	•	•						
Weather-resistant	•	•	•	•	•	•	•			•	•
Other features											
Freely programmable application programs	6	6	6	6			6	5	5	5	5
System rinsing with water instead of air			•								
1-line display						•		•		•	•
LC display with 4 x 20 lines	•	•	•	•			•		•	•	•
Self-emptying sample vessels				•							
pH, conductivity, O ₂ , redox potential measurement		Optional							Optional		Optional
Weight (kg)	90	105	90	Approx. 115	8	10-20	13	63	63	79	13

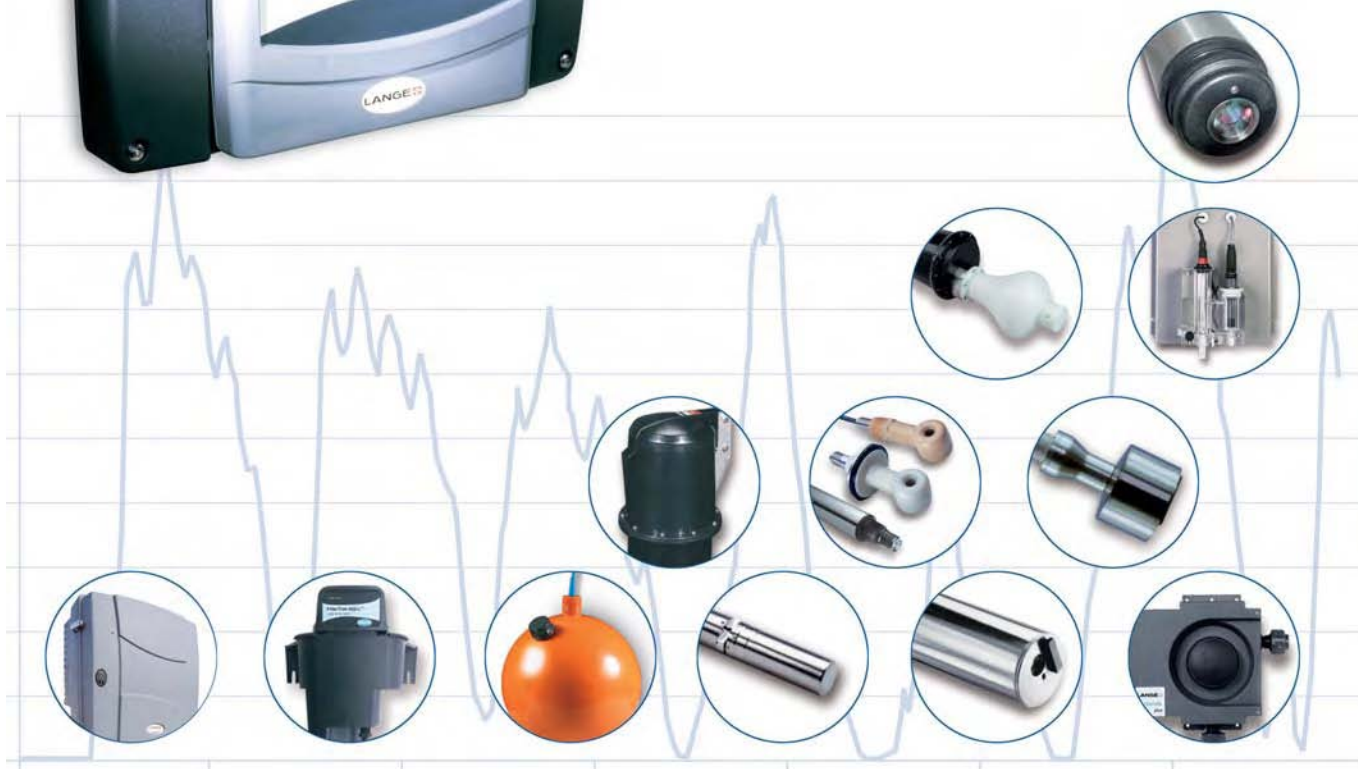
* Only with SIGMA AV flow sensor

Outstanding process measurement technology from HACH LANGE

Reliable, stable processes are essential for cost effective process measurement. This is true of both drinking-water and wastewater treatment systems. With versatile probes and integrated digital controller networks, HACH LANGE sets the standards for excellent process-measurement technology. With reliable monitoring of all relevant parameters, for every user requirement, this ensures accurate performance and cuts in operating costs.



- SC controllers: page 96
- Turbidity, solids and sludge parameters: page 101
- pH, O₂ and conductivity sensors: page 111
- N and P parameters: page 121
- TOC and SAC: page 135
- Chlorine and ozone: page 139
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- Flow and level meters: page 142
- Mounting accessories: page 144



Innovative, cost effective, versatile: the SC standard controller system

The SC 100 and SC 1000 standard controllers are the platform for all intelligent probes and analysers from HACH LANGE. Whether for stand alone use or in a network incorporating sensors for a variety of parameters, they provide a reliable and flexible interface for users and their systems.

Benefits of the SC platform

Intelligent sensors incorporate evaluation and signal processing. This means that different probes can be connected to a single standard controller. The system automatically recognises all probes (plug and play) and has intuitive menus.

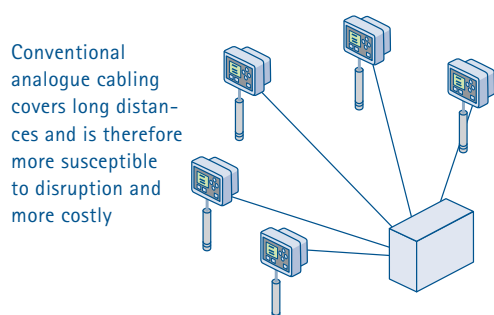
Freedom to adapt

The standard controllers enable users to take advantage of the latest technology probe configuration, secure in the knowledge that they can be modified whenever needed. They offer the freedom to change measurement locations or parameters, adapting to your needs.

Reliable measurement values thanks to digital communication

Digital signal transmission between probes and controllers ensures reliable exchange of data over long distances. Comprehensive diagnostic functions are also a feature of the new technology. Different modules are available so the controller can be connected to a variety of field bus systems.

Conventional analogue system

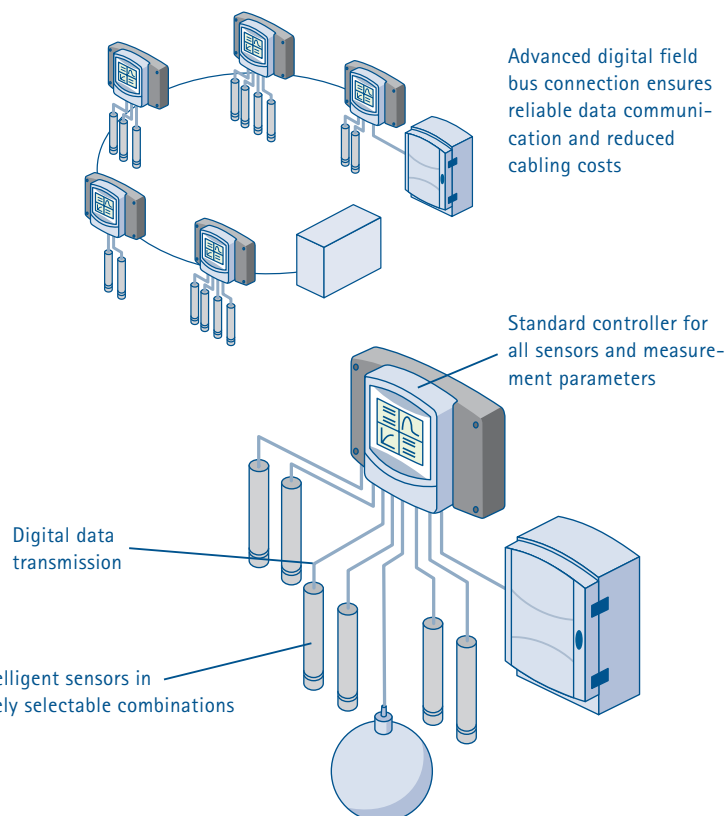


Sensor-specific display unit/
transmitter/controller

Analogue
data transmission

Sensor for pH, O₂,
turbidity, etc.

Future-safe SC controller system



A direct comparison shows that the SC standard controller system cuts costs and provides future-safe flexibility

Cost effective digital controller for stand alone solutions: SC 100

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- For up to 2 SC probes or electrodes—plug & play
- Programmable relay contacts
- PID control via analogue output
- Bus option
- Data logging standard

Standard controller for up to 2 digital sensors

The new SC 100 controller has two independent probe connectors, with which it can control one or two different digital sensors simultaneously. Both measured values are displayed on screen and can be transmitted in either analogue or digital form to high-level control systems.

Comprehensive integrated control functions

The SC 100 standard controller is pre-configured with conventional control algorithms such as two-position controllers, P, PI and PID controllers and can be easily configured on site. It can assist in monitoring isolated parameters cost effectively, without additional external modules.

Configurations of the SC 100 and SC 60 Controllers

ART. NO.	SC 100 Controller (LXV401) or SC 60 Controller (LXV403) with 115/230 V AC power supply
LXV401.99.20001	No bus connections (basic configuration)
LXV403.99.20001	
LXV401.99.21001	MODBUS 232
LXV403.99.21001	
LXV401.99.22001	MODBUS 485
LXV403.99.22001	
LXV401.99.23001	Profibus DP
LXV403.99.23001	



SC 100 and SC 60 Controller Technical data

Model No.	LXV401/LXV403
Measurement input SC 100	2 digital probes or electrodes, all parameters easily configurable
Measurement input SC 60	1 digital probe or electrode, only electrochemistry, except LDO
Ambient temperature	-20 – +60 °C
Analogue outputs	2 x 0/4 to 20 mA, measured values or PID controller
Relays	3 potential-free changeover switches, 5 A 115/230 V AC, 5 A 30 V DC, programmable as limiting value, status, P controller, or alarm
Interfaces	Optional: RS232 Modbus, RS485 Modbus, Profibus DP
Power requirements	90 – 125 V AC, 200 – 240 V AC, 50/60 Hz, also optionally available as 24 V DC model

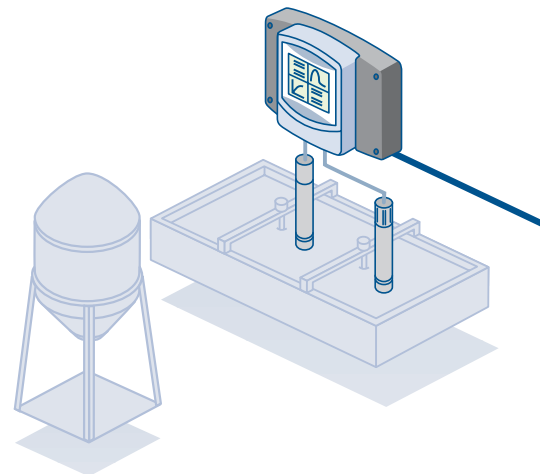
→ Mount kit for the SC 100 controller: see page 144



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "SC 100 Controller", with free downloads of brochure (DOC033.52.00400) and User Manual (DOC023.52.00032)

The latest technology for networks and stand alone solutions: SC 1000 controller

- Digital controller for up to 8 digital probes and analysers
- Cost effective, can be upgraded any time
- Integration of existing measurement signals
- Comprehensive control and calculation functions
- Simple operation with portable touchscreen
- Remote data transmission and remote control by SMS



New sensors are recognised automatically.

SC 1000 for stand alone measurements for a variety of parameters

The SC 1000 is ideal for multi-parameter tasks in small plants, remote areas of a plant, or surface water quality stations.

Cost effective: Connecting up to eight sensors to a single SC 1000 controller is cost effective as all existing signals are integrated.

Secure: The GSM option enables unmanned plants to be monitored. Alarm and status messages are transmitted wirelessly to the control room or by SMS to a mobile phone.

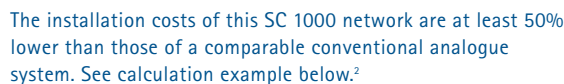
User friendly: The uniform interface with a touchscreen makes operation intuitive. The colour display shows the data and time curves of four sensors simultaneously.

Future-safe: The SC 1000 system can be upgraded at any time.

SC 1000 with field bus: multi-plant networking

SC 1000 controllers or complete SC 1000 networks can be integrated into multi-plant networks. The benefits of a standard field bus through the SC 1000 controller are:

- Cost savings through simpler cabling
- Greater operational assurance
- More diagnostic options



Integration capability: Existing sensors including analogue can be integrated easily into the SC 1000 system through expansion modules. Control and calculation functions enable new quantities to be derived, e.g. for loads.

The comparison shows how the installation of a SC 1000 network cuts costs; in the example above, at least 50% on the controllers and 90% on signal and relay cables. In the SC 1000 network, absolutely no scaling of the analogue signal is necessary.

Primary settlement tank to control room: 1 LU per sensor for 4 sensors: 4 LU
Activated sludge tank to control room: 2 LU per sensor for 5 sensors: 10 LU
Final settlement tank to control room: 3 LU per sensor for 5 sensors: 15 LU

SC 1000 controller modules and configurations



Each SC 1000 network needs only one display module, which can be easily transported when needed.



Simply insert into the permanently installed probe module.



A new sensor can now be installed without any difficulty.

SC 1000 controller system—short descriptions and model numbers of the modules

A SC 1000 controller system consists of a single LXV402 display module and one or more LXV400 probe modules. It is configured to customer specific requirements and can be expanded at any time by additional measuring stations, sensors, inputs and outputs, bus interfaces.

LXV402 display module	The display module can be attached to any probe module. Information from the connected sensors (in a SC 1000 network, from all sensors) is shown in colour on the touchscreen. Optional, alarm and status messages can be transmitted by GSM as SMS.
LXV400 probe module	The probe module is installed at a measuring station and can be connected to up to eight sensors. Several probe modules can be linked to create a SC 1000 network.
LZX915 base module	In the SC 1000 network, the base module supplies any combinations of expansion modules in the switch cabinet with 24 V DC
Expansion modules	LZX920 relay module, programmable as limit, status or timer LZX919 output module for transmitting analogue current outputs (0–20 mA or 4–20 mA) LZX921 input module for integrating digital or analogue inputs (0–20 mA or 4–20 mA)

SC 1000 controller system—examples of configurations

ART. NO.	DESCRIPTION
SC 1000 FOR 4 SENSORS, WITH CURRENT OUTPUTS AND RELAYS—ALTERNATIVELY WITH 24 V DC	
LXV402.99.00001	SC 1000 display module
LXV402.99.01001	Alternatively: SC 1000 display module with GSM for remote data transmission and remote operation
LXV400.99.2R121	SC 1000 probe module to which up to 4 SC sensors can be connected, with an analogue output card with 4 outputs (0–20 mA or 4–20 mA), with a relay card with 4 break contacts (NC), with 100–240 V AC power supply with EU power cable
LXV400.99.ZR121	Alternatively: SC 1000 probe module as above, but with 24 V DC power supply
LXV400.99.2E021	Alternatively: SC 1000 probe module as above, but with ProfiBus DP network interface instead of mA outputs and relays
SC 1000 FOR 8 SENSORS WITH 8 CURRENT OUTPUTS AND 8 RELAYS AS EXPANSION MODULES	
LXV402.99.00001	SC 1000 display module
LXV400.99.20041	SC 1000 probe module to which up to 8 SC sensors can be connected, with 100–240 V AC voltage supply with EU power cable
LZX915 (1x)	DIN rail mount base module
LZX919 (4x)	DIN rail mount output module, 2 outputs (0–20 mA or 4–20 mA)
LZX921 (1x)	DIN rail mount input module, 2 analogue or digital inputs (0–20 mA or 4–20 mA)
LZX920 (2x)	DIN rail mount relay module, 4 relays, max. 240 V

→ Mounting device for the SC 1000 controller: see page 144



More information at www.hach-lange.co.uk,
www.hach-lange.com keyword "SC 1000 Controller",
with free downloads of the brochure (DOC033.52.00400)
and user manual

Comprehensive solutions for turbidity, solids, particles and sludge

Drinking water treatment, industrial water treatment, wastewater treatment, demand special attention. Clear water requires consistent filter management to ensure operational reliability. Processes in which sludge is generated also need to be monitored continuously to ensure that everything runs smoothly and the costs of sludge dewatering and disposal are firmly under control. HACH LANGE have a wide range of solutions for turbidity, solids, particles and sludge.

ARTI particle counter with two measuring ranges

The ARTI particle counter provides information about the number and size of particles in water. It is especially suitable for drinking water applications. The two ARTI models detect particle sizes of 1.3–25 or 2–100 µm.

→ ARTI particle counter: see page 102

Turbidity measurements that conform with EN/ISO or USEPA

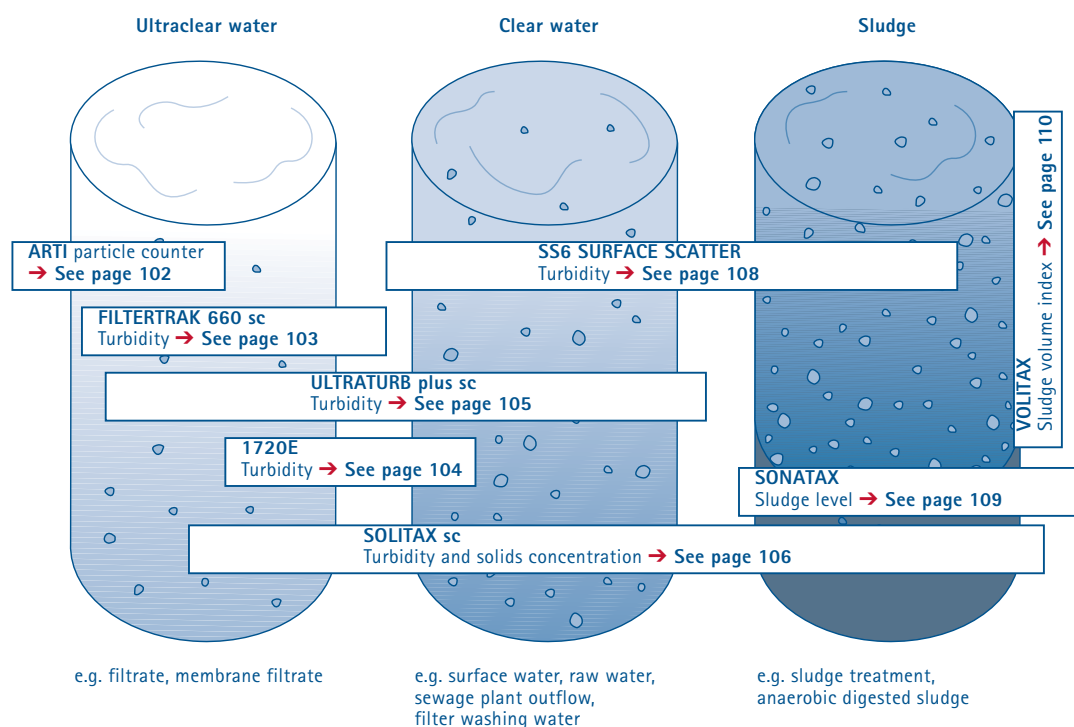
HACH LANGE has the right technical solution for each standard: the versatile ULTRATURB infrared sensor for EN ISO, the 1720E white light sensors (clear liquid) and FILTERTRAK 660 sc (ultra-clear liquid) for USEPA.

→ Turbidity sensors: see page 103

Probes for solids and sludge

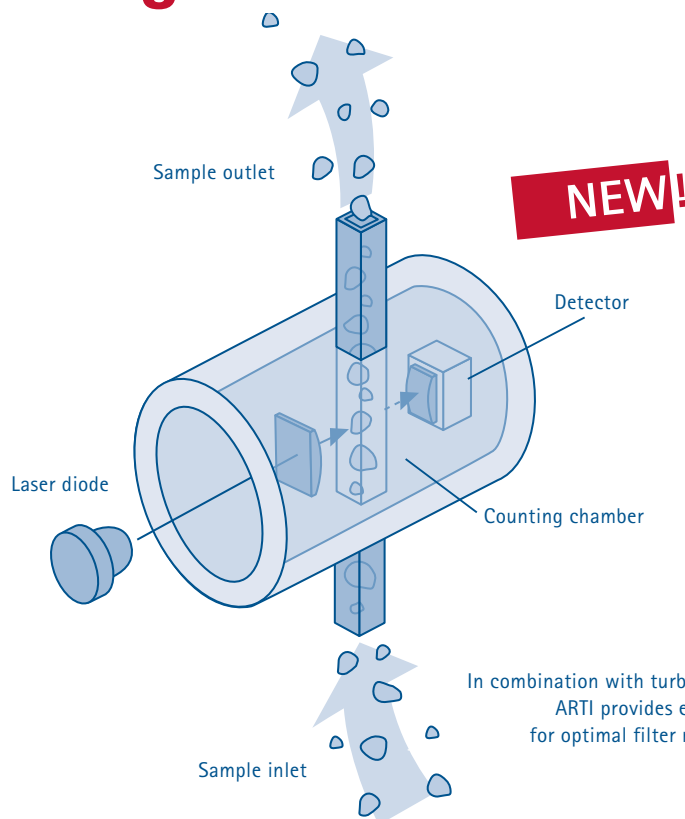
SOLITAX probes can be used for applications ranging from ultraclear water to highly concentrated sludge. SONATAX and VOLITAX probes enable sludge to be measured on the basis of the sludge level, volume and index.

→ Sensors for solids and sludge: see page 106



ARTI particle counter for effective monitoring of drinking water

- Eight measurement channels; easy to read display with scroll function
- Two sensor variants
- AQUARIUS software for extensive evaluations and displays of results
- Simple to install in a network or as a stand-alone instrument



Technical data for ARTI particle counters

Measuring instrument	ARTI WPC-21 particle counter	ARTI WPC-22 particle counter
Model No.	LXV435	LXV436
Particle size	1; 3; 2; 3; 5; 7; 10; 15; 25 µm	2; 5; 7; 10; 15; 25; 50; 100 µm
Sample flow	45–55 ml/min	90–110 ml/min
Calibration	Calibrated with PSL (polystyrene latex spheres) in water; sample flow 50 ml/min	Calibrated with PSL (polystyrene latex spheres) in water; sample flow 100 ml/min
Coincidence errors	10% loss at 25,000 particles/ml	10% loss at 15,000 particles/ml
Ambient temperature	0–40 °C	0–45 °C
Sample temperature	0–50 °C	
Channels	Eight channels are available; two can be shown simultaneously, all channels are accessible through scroll function	
Measurement method	Light blocking	
Light source	Laser diode (780 nm)	
Resolution of measured value	≤ 10% von 10 µm per ASTM-F658-87	
Unit	Concentration, number of particles/ml	
Display	4 lines x 16 characters, LCD, LEDs for instrument function, power supply, alarm status	
Interfaces, outputs	RS485 and RS232, two channels for analogue inputs/outputs (0–10 V, 4–20 mA)	
Power supply	90–264 V AC, 47–63 Hz	
Data storage	Internal memory for 100 measured values	
Housing	Modified NEMA 4X/IP 66	
Dimensions	114 x 248 x 302 mm (H x B x D)	
Weight	2.25 kg	
Maintenance	0.5 h/month	

Accessories

DESCRIPTION	ART. NO.
Overflow collector for sample volume dosage	2081335-1
RS485/RS232 converter	2082393-2
AQUARIUS software for evaluation and displaying the results of up to 32 networked particle counters; Windows-compatible from Windows95®	CS200011-01



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "ARTI", with free downloads of brochure (DOC063.52.00464) and User Manual (DOC023.52.00090)

The laser turbidity sensor for ultraclear fluids: FILTERTRAK 660 sc

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- **Rapid detection of filter failures**
- **Conforms to USEPA 10133**
- **Excellent resolution with laser optics**
- **Simple calibration**
- **Plug and play with SC controllers**

FILTERTRAK 660 sc—designed for ultraclear fluids

The FILTERTRAK 660 sc was designed as a laser turbidity probe to conform with USEPA 10133. Its measuring range is 0.0001 mNTU to 5,000 mNTU. The FILTERTRAK 660 sc detects imminent filter failures much earlier than conventional photometric turbidimeters. The high resolution makes the probe essential in ultra-clear fluids.

RSD detects the first signs of filter problems

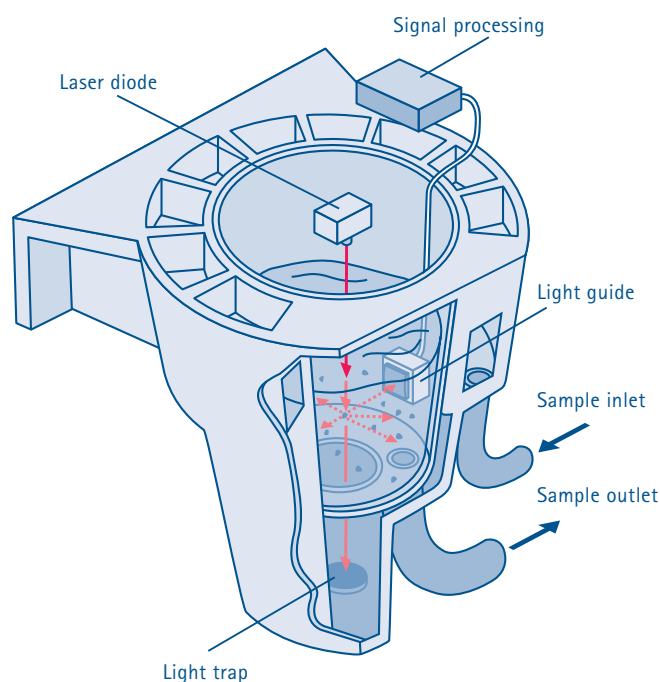
The special design of the FILTERTRAK 660 sc enables the relative standard deviation (RSD) to be calculated. It is determined automatically from the most recent turbidity measurements. Benefits include, the RSD detecting the first signs of any filter problems.



Technical data for FILTERTRAK 660 sc

Art. no.	LPV421.99.00011
Measuring instrument	Microprocessor-controlled bypass turbidity probe with self-diagnosis
Measurement method	90° scatter light in conformity with USEPA 10133 (660 nm laser diode)
Measuring range	0.0001 – 5,000 mNTU (FNU, TE/F)
Resolution	0.001 mNTU in the lowest measuring range, 0.1 mNTU in the highest measuring range
Response time	6/30/60/90 s programmable
Air bubble compensation	Physical with integrated bubble trap
Calibration	With ready-to-use STABL CAL standards
Sample requirement	Min. 0.10 l/min, max. 0.75 l/min
Sample temperature	Max. 50 °C
Ambient temperature	+2 °C – +40 °C
Protection class	NEMA 4X/IP 66
Dimensions	384 x 312 x 238 mm (W x H x D)
Weight	4.5 kg
Maintenance	1.5 h/month

- For more information about STABL CAL formazin primary standards: see page 76
- SC controller for FILTERTRAK 660 sc: see page 96



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "FILTERTRAK 660", with free downloads of brochure (DOC063.52.00433) and User Manual (DOC023.52.00054)

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The white light turbidity sensor for low-medium turbidity: 1720E

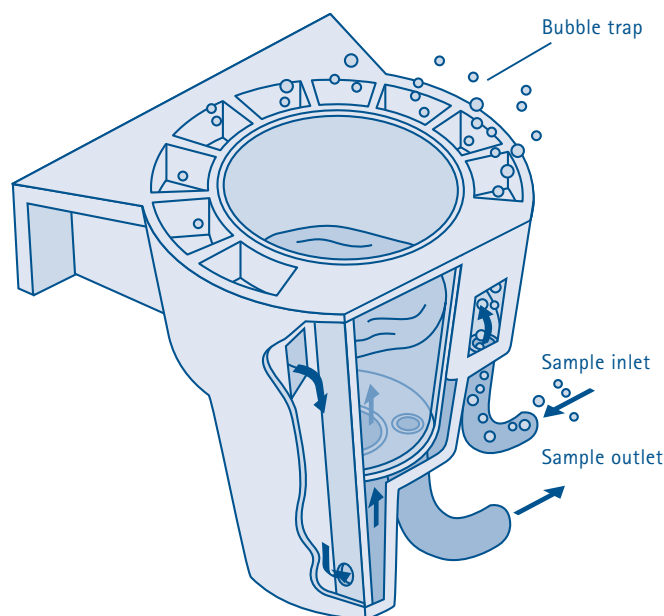
- Optimised sensor technology for low levels of turbidity
- Plug and play with SC controllers
- Interference-free due to patented bubble trap
- Easily combined with other probes through SC Controllers
- Conforms to USEPA 180.1

1720E—white light probes

The 1720E belongs to the world-leading 1720 series of white light probes and conforms to the USEPA 180.1 standard. With a measuring range from 0.001 up to 100 NTU, the 1720E is suitable for determining the turbidity of clear to slightly turbid fluids. It can be used to ensure reliable filtration management in municipal and industrial water treatment.

50 years of experience in turbidity

HACH LANGE is a leader in the design and manufacturing of turbidity instruments. The patented bubble trap, for example, protects the 1720E turbidity sensor against interference by air bubbles trapped in the sample flow. Maintenance is minimal (1.5 h per month) and can be carried out easily.



Technical data for 1720E turbidity sensor

Art. no.	LPV417.99.00011
Measuring instrument	Microprocessor-controlled bypass turbidity probe with self-diagnosis
Measurement method	90° scatter light in conformity with USEPA 180.1 (tungsten filament white light)
Measuring range	0.0001 – 100 NTU (FNU, TE/F)
Resolution	0.0001 – 9.9999/10,000 – 99,999
Response time	6/30/60/90 s, programmable
Air bubble compensation	Physical with integrated bubble trap
Calibration	With ready-to-use STABL CAL standards
Sample requirement	Min. 0.25 l/min, max. 0.75 l/min
Sample temperature	Max. 50 °C
Ambient temperature	+2 °C – +40 °C
Protection class	NEMA 4X/IP 66
Dimensions	Housing and lid 384 x 312 x 238 mm (H x W x D)
Weight	4.54 kg
Maintenance	1.5 h/month

→ More information about STABL CAL formazin primary standards: see page 76



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "1720", with free downloads of brochure (DOC053.52.03714) and User Manual (DOC023.52.03221)



SC 100 Controller:

Up to two probes can be connected, e.g. two 1720Es

→ For more information see page 97



SC 1000 Controller:

Up to eight probes can be connected, of which two can be the 1720Es.

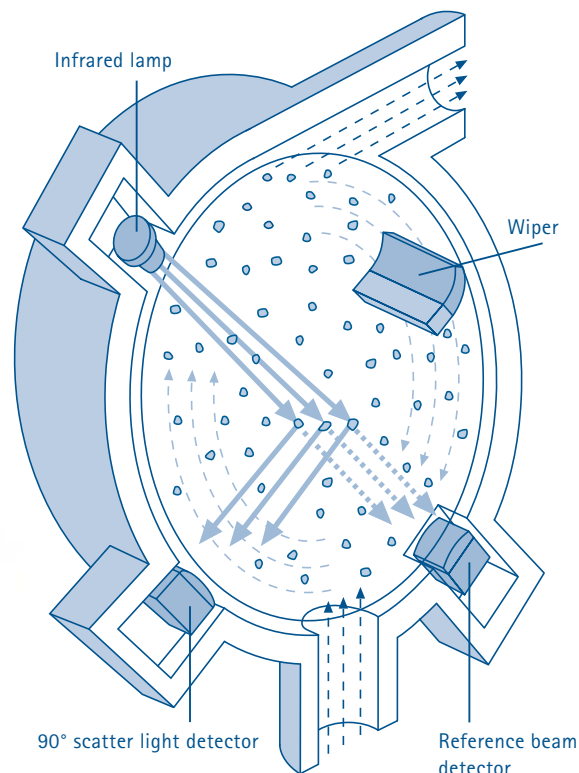
→ For more information see page 98

The top class infrared turbidity probe: ULTRATURB plus sc

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- **Wide measuring range: 0.0001–1,000 NTU**
- **High resolution 0.0001–0.9999**
- **Long-lasting factory calibration**
- **Self-cleaning measurement chamber**
- **Easily combinable with other SC probes**
- **Plug and play with SC controllers**



All-rounder for very low to medium turbidity

As a precision bypass probe for ultra-clear to moderately turbid fluids, ULTRATURB plus sc is characterised in particular by the low levels of interference light. ULTRATURB plus sc can be used to facilitate filtration management in municipal and industrial water treatment—from raw water control to outlet monitoring.

Automatic cleaning

The ULTRATURB plus sc's automatic wiper cleaning system reliably prevents any soiling in the measurement chamber, guaranteeing of stable measured values, even in the lowest measuring range. The design of the ULTRATURB plus sc complies with EN ISO 7027.

Low operating costs

The pulsed, enduringly stable IR light source works with the automatic cleaning system, guaranteeing stable measured values and minimal maintenance requirement. Simple operation and low investment costs contribute to the instrument's outstanding cost effectiveness.

Technical data for ULTRATURB plus sc turbidity probes

Model No.	LPV415	Calibration	With STABL CAL standards
Measuring instrument	Microprocessor-controlled bypass turbidity sensor with self-diagnosis	Sample requirement	Min. 0.2 l/h, max. 1.0 l/min, max. 6 bar
Measurement method	90° scatter light to EN ISO 7027 Infrared light 860 nm	Sample temperature	Max. 50 °C
Measuring range	0.0001–1,000 FNU (NTU, TE/F)	Ambient temperature	+2 °C – +40 °C
Resolution	0.0001–0.9999; 1.00–99.99; 100–1,000	Protection class	IP 65
Response time	1 – 60 s (programmable)	Automatic cleaning	Wiper system in ULTRATURB plus sc
Air bubble compensation	Physical/mathematical	Dimensions	250 x 240 x 110 mm (W x H x D)
		Weight	1.5 kg
		Maintenance	0.5 h/month for ULTRATURB plus sc



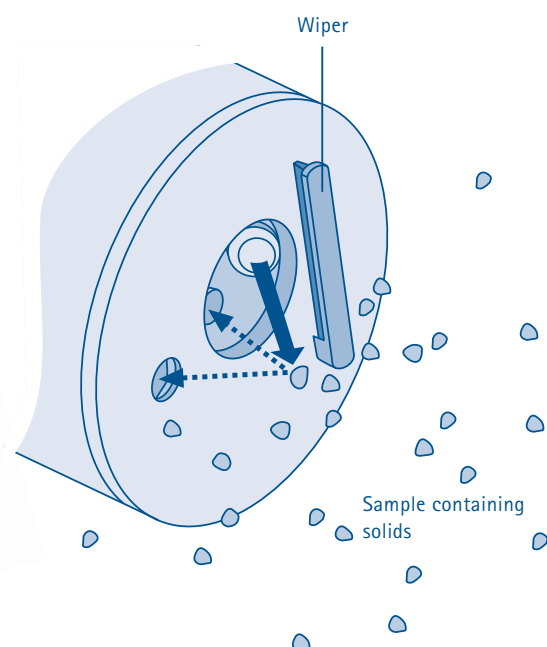
More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "ULTRATURB plus sc", with free downloads of brochure (DOC053.52.03217) and User Manual (DOC023.52.03231)

- Controller for ULTRATURB plus sc turbidity probes: see page 96
- More about STABL CAL formazin primary standards: see page 76

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From the lowest up to the highest solids/ turbidity concentrations: SOLITAX sc probes

The process probes of the SOLITAX sc family can be used to determine turbidity with a high degree of precision from ultraclear to very turbid fluids. In addition, the unique colour independent method of solids measurement enables the concentration of solids to be measured in various types of water and sludge. SOLITAX sc probes can be used for a wide range of applications, from the purification of drinking water and wastewater to the monitoring of surface water and the treatment of sludge.



Wide range of applications

With a measuring range from 0.001 FNU to 150 g/l, SOLITAX sc can determine the lowest levels of turbidity in drinking water treatment systems just as precisely as the high solids concentrations in activated, primary or digested sludge. The SOLITAX sc enables improvements to be achieved in mechanical sludge dewatering.

Simplest calibration

A simple correction factor enables SOLITAX sc to adapt to a variety of sludge characteristics and fluids. There is no need to carry out time-consuming multiple-point calibrations. SOLITAX sc is factory calibrated for long-term calibration stability.

Unique colour independent measurement of solids

Primary sludges, activated sludges with different structures and colours, dark digested sludges and light lime sludges make high demands on the accuracy of solids measurements. The patented dual scatter light measurement method of the SOLITAX solids probes ensures success.

→ Laboratory analysis: see Chapter 2-8 → Laboratory automation: see Chapter 9 → Samplers: see Chapter 10

Applications for SOLITAX sc solids probes

SOLITAX MODELS	T-LINE sc	TS-LINE sc	INLINE sc	HS-LINE sc	HIGHLINE sc
TURBIDITY MEASUREMENT					
Drinking water	•	•	•	•	•
Wastewater	•	•	•	•	•
SOLIDS MEASUREMENT					
Primary sludge				•	•
Thickened sludge				•	•
Activated sludge		•	•	•	•
Return sludge		•	•	•	•
Dewatered return sludge		•	•	•	•
Digested sludge				•	•
Centrate water		•	•	•	•
Lime sludge		•	•	•	•

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Technical data for SOLITAX sc solids probes

SOLITAX MODELS	T-LINE sc	TS-LINE sc	INLINE sc	HS-LINE sc	HIGHLINE sc
Art. no.	LXV423.99.xx000	LXV423.99.xx100	LXV424.99.xx100	LXV423.99.xx200	LXV424.99.xx200
Form	Immersion probe	Immersion probe	Built-in probe	Immersion probe	Built-in probe
Housing	PVC	PVC/stainless steel	Stainless steel	PVC/stainless steel	Stainless steel
Parameter	Turbidity	Turbidity			
	-	Solids			
Measurement method	90° IR scatter light	IR dual scatter light			
- Turbidity	DIN EN ISO 7027	DIN EN ISO 7027			
- Solids	-	Equivalent to DIN 37414			
Measuring range					
- Turbidity*	0.001–4,000 FNU	0.001–4,000 FNU			
- Solids	-	0.001–50 g/l		0.001–150 g/l	
Accuracy					
- Turbidity*	< 1% or 0.001 FNU	< 1% or 0.001 FNU			
- Solids	-	< 5%			
Response time	1–300 sec	1–300 sec			
Sample temperature	0–40 °C	0–40 °C			
Flow rate	3 m/sec	3 m/sec			
Immersion depth	0.1–10 m	0.1–10 m/60 m**	-	0.1–10 m/60 m**	-
Pressure range	1 bar	1 bar/6 bar**	6 bar	1 bar/6 bar**	6 bar
Cleaning	With automatic wiper/Without wiper				
Cable length	10 m fixed, maximum 100 m extension cable				
Weight	520 g	520 g/1,400 g**	2,400 g	520 g/1,400 g**	2,400 g
Dimensions (D x L)	60 x 200 mm	60 x 200 mm	60 x 315 mm	60 x 200 mm	60 x 315 mm

*With correction of user-specific offset **PVC/stainless steel

Order information for fittings of the SOLITAX sc probes

FITTINGS	BUILT-IN PROBES			IMMERSION PROBES
Model number	LZX461	LZX337	LZX936	See page 144
Pipe connector	Flange DN 65; PN 16; DIN 2633			
Pressure range	≤ 1 bar	≤ 5 bar	≤ 1 bar	
Ball valve	No	Yes	Yes	



SC 100 Controller:

Up to two probes can be connected,
e.g. two SOLITAX sc

→ For more information see page 97



SC 1000 Controller:

Up to eight probes can be connected, of which two can be a SOLITAX sc; optional expansion by networking.

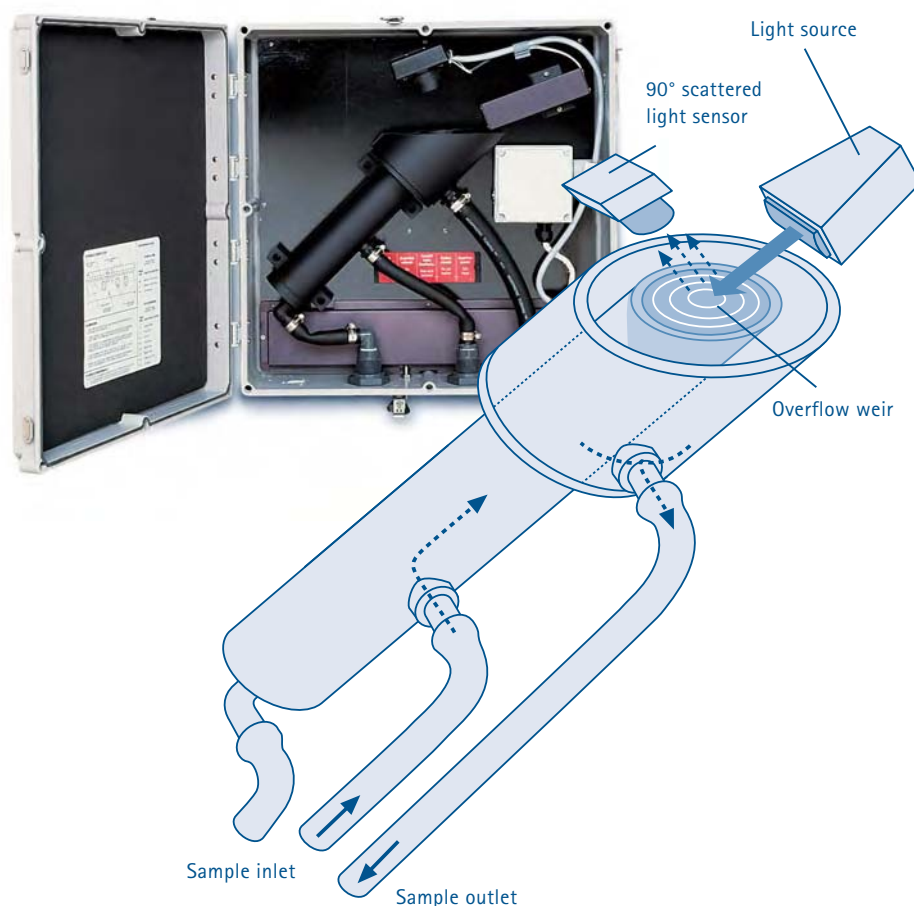
→ For more information see page 98



More information at www.hach-lange.co.uk,
www.hach-lange.com, keyword "SOLITAX sc", with
free downloads of brochure (DOC063.52.00353) and User
Manual (DOC023.52.03232)

Essential for tough industrial applications: SS6 turbidity probe

- Wide measuring range from 1–9,999 NTU
- Patented, contact free measurement
- No contact between optical components and fluid
- Suitable for high temperatures and highly turbid fluids



Surface Scatter 6

The Surface Scatter 6 (SS6) turbidimeter is characterised by its excellent durable construction and is ideal for continuous monitoring of sample flows with high solids content. The bypass probe is specially designed for difficult ambient conditions and requires very little maintenance.

Surface Scatter 6 HST

With all the benefits of the standard model, the material and the air removal system of the Surface Scatter 6 HST housing make it ideal for measuring hot and corrosive samples. High-quality accessories, such as the auto flush kit, the sample cooler and the air removal unit and bubble trap, make the Surface Scatter 6 HST essential for tough industrial applications.

Technical data for SS6 and SS6 HST turbidity probes

Model No.	4500010 SS6 4500040 SS6 HST	Air bubble compensation	Physical with external bubble trap
System components	Bypass turbidity probe; evaluation unit with self-diagnosis	Calibration	Factory-calibrated (calibration/verification with formazin and/or solid standard)
Measurement method	90° scatter light (tungsten filament white light)	Sample requirements	Min. 1 l/min, max. 2 l/min
Measuring range	1.00–9,999 NTU	Sample temperature	SS6 max. 50 °C, SS6 HST max. 70 °C (90 °C with sample cooler)
Resolution	0.01–99.99 100.1–999.9 1,000–9,999	Ambient temperature	+ 2 °C – + 40 °C
Response time	30 s (1.7 min T 90 at 2.0 l/min)	Protection class	NEMA 4X/IP 66
		Maintenance	2 h/per month when in normal use



More information at www.hach-lange.co.uk, www.hach-lange.com,
keyword "Surface Scatter".

The superior way of measuring sludge levels: SONATAX sc process probe

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- Measured values are independent of the solids content
- Reliable measured values even with fluctuating profiles and temperatures
- Graphic representation of sludge profile with SC 1000 Controller
- Automatic cleaning

Flexible use

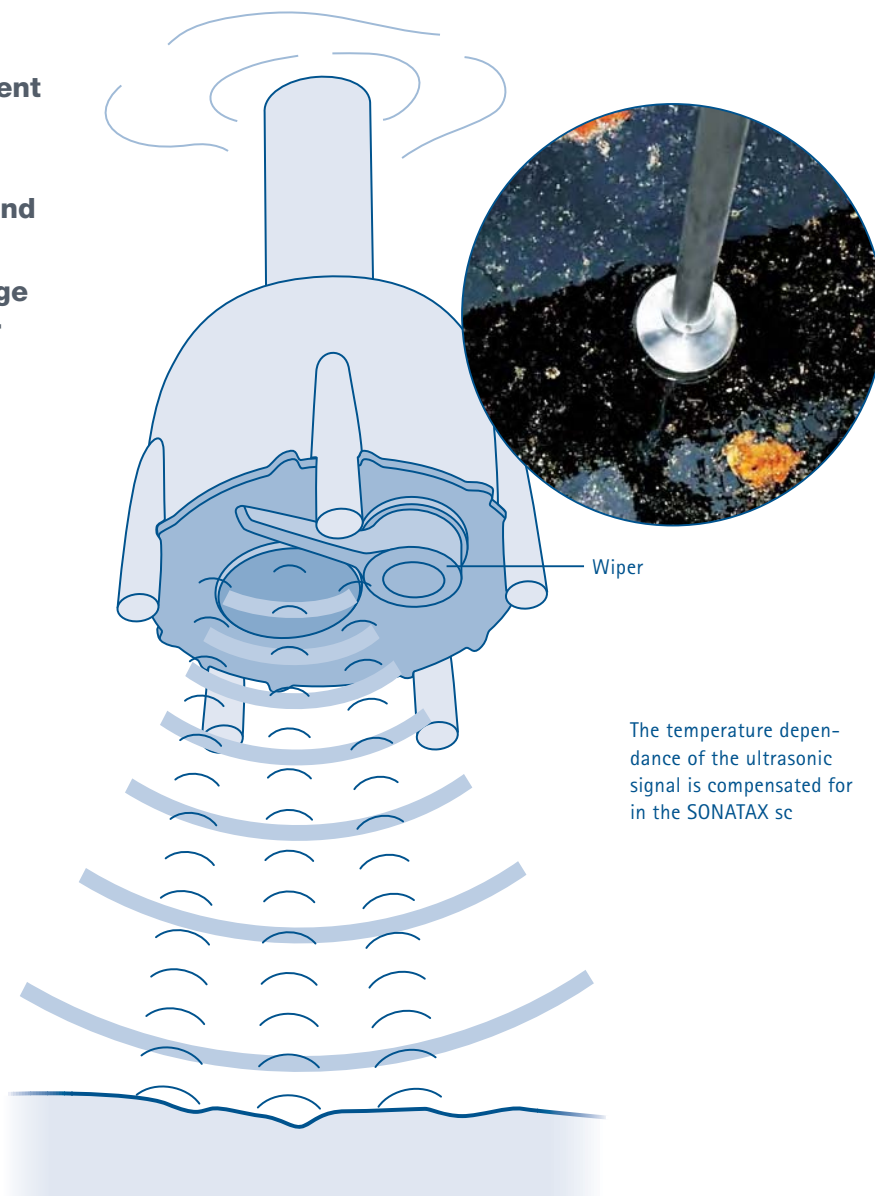
The SONATAX sc probe determines the sludge level in a wide range of applications in wastewater and drinking water treatment plants. The SONATAX sc is ideal for monitoring the solid/liquid interface.

Reliable readings

To ensure the greatest possible accuracy at all times, the sensitivity of the probe adjusts to the fluctuating solids concentration and sludge profile in the sedimentation tank. Structures (pipes, agitators, etc.) in the tanks can be accounted for.

Easy handling, low maintenance

SONATAX sc has an efficient automatic wiper system to keep the ultrasonic head clean. The process probe is factory calibrated for long-term calibration stability. A simple correction factor allows adjustment to local conditions.



The temperature dependence of the ultrasonic signal is compensated for in the SONATAX sc

Technical data for SONATAX sc

Instrument + Art.-No.	Self-cleaning ultrasonic probe with temperature compensation and magnetically connected wiper (LXV431.99.00001)
Measuring range	0.2 – 12 m sludge level or sludge height
Response time	10 s (adjustable)
Calibration	Factory-calibrated
Resolution	0.03 m sludge level
Sample temperature	+2 °C – +40 °C
Dimensions	130 x 185 mm (L x D)

- Mount kit for the SONATAX sc probe: see page 144
- SC Controller for SONATAX sc see page 96



More information at www.hach-lange.co.uk,
www.hach-lange.com, keyword „SONATAX“, with free
 downloads of brochure and User Manual

Continuous Insitu measurement of SVI, SV and SS: VOLITAX

- In-situ measurement
- Measuring range of up to 750 ml/l
- Graphic representation of sedimentation behaviour
- Maximum of 3 parameters: SVI, SV and SS

Precise measurement of sludge volume in the aeration basin

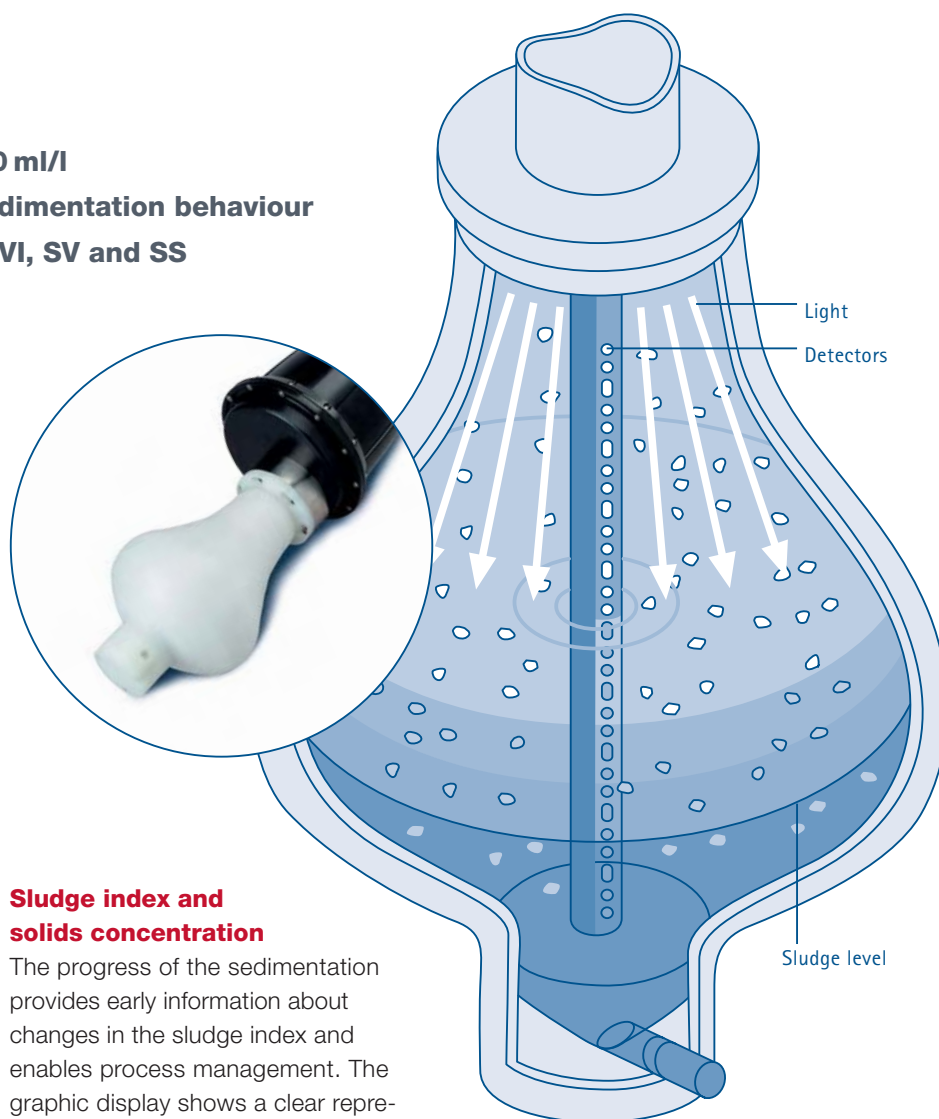
Submerged in the basin, VOLITAX determines the sludge volume by optically monitoring the sludge level during a sedimentation period of 30 minutes. This is the only method that guarantees exact measured values from the unchanged sample, without any interference from the sampling procedure, transportation and further processing.

DIN-equivalent results over a wide measuring range

The wide diameter at the bottom of the sedimentation vessel allows sludge flocs to sink unobstructed, even when high sludge volumes are present, without dilution. This is why measurements of the sludge volume with VOLITAX correlate well with the reference method over a range of sludge types.

Sludge index and solids concentration

The progress of the sedimentation provides early information about changes in the sludge index and enables process management. The graphic display shows a clear representation of the sedimentation curve. If the SOLITAX probe is connected, the sludge volume, index and solids concentration are indicated.



The VOLITAX sedimentation vessel is filled by hydrostatic pressure. No changing of the sludge structure.

Technical data for VOLITAX

Measurement instrument	VOLITAX probe (LXV279) VOLITAX display unit (LXV309) with graphic display
Measurement method	Sludge volume measurement equivalent to DIN 38 414 part 10; sludge volume index with SOLITAX
Measuring range	50 to > 750 ml/l
Resolution	< 10 ml/l

Measurement uncertainty	± 10% of measured value, ± 20 ml/l in comparison with DIN 38 414-10
Response time	37 min
Calibration	Factory-calibrated for long-term calibration
Sample temperature	Water temperature max. 40 °C
Maintenance	1 h/month when in normal use

- Mount kits for VOLITAX sludge volume probe: see page 144
- For more information about SOLITAX solids probe: see page 106



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "VOLITAX", with free downloads of brochure (DOC033.52.03173) and User Manual (DOC023.52.03095)

pH, conductivity, oxygen: reliable monitoring for all applications

The reliable monitoring of pH, oxygen and conductivity is the basis for efficient process control in many applications. The many and varied fields in which these parameters are used require special solutions, which the extensive HACH LANGE range of products can provide. The continuous measurement of dissolved oxygen is a key area, with exciting innovations. It enables savings to be made in the control of aeration processes, e.g. in sewage treatment plants.



NEW!

SIPAN 32X, the controller with explosion protection and two-wire technology, ProfiBus DP HART, sensors and fittings for industrial applications

→ See pages 112, 114, 116



NEW!

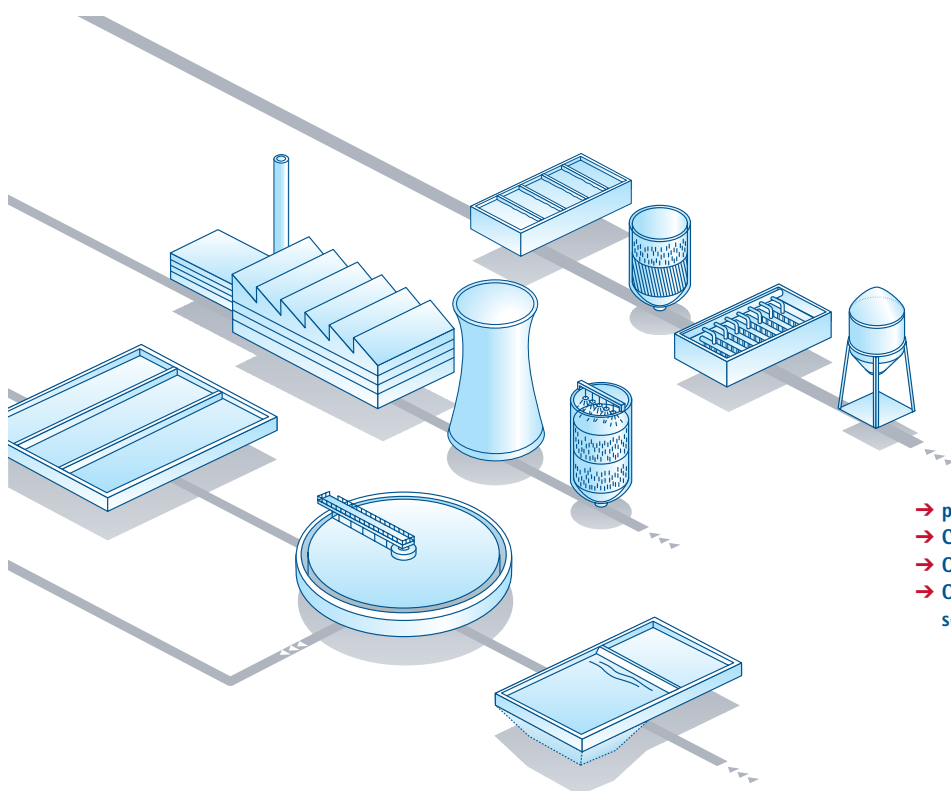
EVITA OXY oxygen probe with automatic TILTAL calibration

→ See page 118



LDO oxygen sensor, no calibration, no change of electrolyte, no drift

→ See page 117



→ pH + redox: see page 112
→ Conductivity: see page 114
→ Oxygen: see page 116
→ Order information and sensors: see page 119

pH monitoring: applications and solutions

pH is one of the world's most frequently determined analytical parameter. Indispensable for product quality and the treatment of wastewater and drinking water. pH sensors must ensure long-term safety and be cost effective. The extensive HACH LANGE range of sensors offers the optimal solution for every application, from low-ion drinking and surface water to aggressive production flows at extreme temperatures.

pH applications

SOLUTIONS FOR	WASTEWATER									PROCESS WATER			DRINKING WATER
Measurement location	Industrial inflow	Industrial inflow, Ex*	Municipal inflow	Municipal inflow, Ex*	Active sludge tank	Active sludge tank, Ex*	Digester	Digester, Ex*	Outflow	High-purity water/power generation	Production	Production, Ex*	Drinking water
Container/Tank, open	SC	SIPAN 32X	SC	SIPAN 32X	SC	SIPAN 32X			SC		SIPAN	SIPAN 32X	
Container/Tank, closed	SC	SIPAN 32X	SC	SIPAN 32X	SC	SIPAN 32X			SC		SIPAN	SIPAN 32X	
In-line Pipe insertion	SC	SIPAN 32X	SC	SIPAN 32X			SC	SIPAN 32X	SC		SIPAN	SIPAN 32X	
Flow-through	SC	SIPAN 32X								SC/MONEC/ SIPAN	SIPAN	SIPAN 32X	SC/MONEC

* Explosion proof

→ Data and order information about the sensors: see page 119



SIPAN 32X single channel controller with explosion proof and two-wire technology



MONEC single channel controller for analogue sensors

SC standard controller—the digital platform

SC multichannel controllers recognise digital sensors automatically. Numerous analogue pH sensors can be connected to the SC platform. SC controllers form a uniform interface between operator and plant for single parameter applications as well as complex networks. They provide long-term operation and are cost effective.

→ Information about mounting devices for sensors: see page 144



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "pHD sc" or "1200 sc" with free downloads of brochures (pHD sc: DOC053.52.03255; 1200 sc: DOC053.52.03253) and User Manuals (pHD sc: DOC023.52.03251; 1200 sc: DOC023.52.00023)

pH and redox: highly versatile pHD sc and 1200 sc sensors

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- pHD differential electrode with a very low maintenance requirement
- 24-month warranty for the pHD electrode
- Even greater reliability thanks to digital measurement signal
- Wide range of applications with a variety of models
- Choice of pHD electrode materials to suit the application



1200S sc and pHD immersion sensors made of stainless steel

pHD sc: the innovative differential electrode

The patented pHD sensors have three instead of the usual two electrodes. This gives them a previously unheard of degree of precision and resistance to interference factors. Instead of a diaphragm, a salt bridge protects the reference electrode. This increases its service life and considerably reduces the time needed for calibration and maintenance.

1200 sc: the proven single-rod electrodes

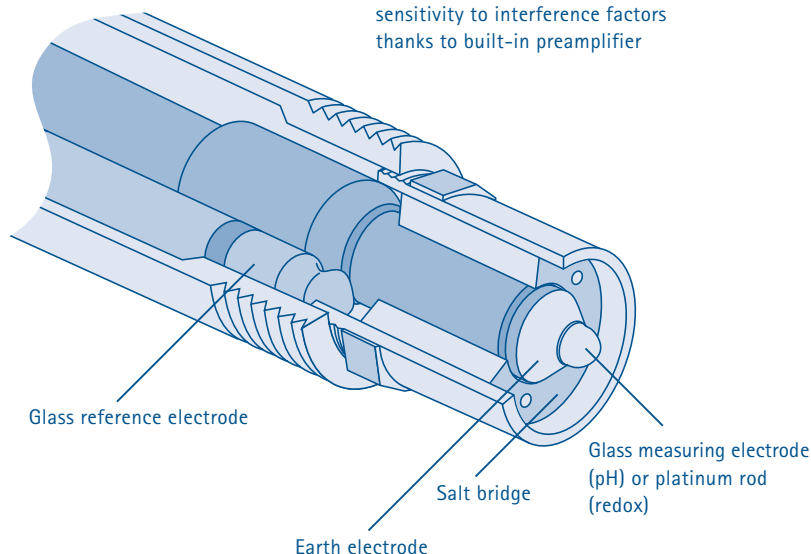
The high quality 1200 sc combination electrodes have proved their usefulness in many fields of application. They are available in more than 20 versions for almost all applications. Like the pHD sensors, all 1200 sc sensors can be operated directly or indirectly with the universal SC controllers.

Benefits

Whether in municipal or industrial wastewater, drinking water or process water. Application specific design guarantees the operational reliability of the redox probes. The digital technology enables them to be freely combined with other SC probes.



SC 100 controller:
Up to two SC probes can be connected



Patented pHD technology: low sensitivity to interference factors thanks to built-in preamplifier

- Data and order information about the pHD sc and 1200 sc sensors: see page 119
- Mount kits for the pHD sc and 1200 sc pH and redox probes: see page 144
- For more information about the SINGLET buffers: see page 28

Conductivity measurement: applications and solutions

The electrical conductivity of water serves as a sum parameter for dissolved content. Excessively high salt concentrations attributable to human activity impair the quality of surface waters. Conductivity is also carefully monitored in industrial processes, as the dissolved salts cause corrosion or affect water quality. HACH LANGE's conductive and inductive conductivity sensors cover every application from ultrapure water to highly polluted wastewater.

Conductivity applications

SOLUTIONS FOR	WASTEWATER							PROCESS WATER			DRINKING WATER
Measurement location	Industrial inflow	Industrial inflow, Ex	Municipal inflow	Municipal inflow, Ex	Active sludge tank	Digester	Outflow	High-purity water	Production	Production, Ex	Drinking water
Container/Tank; open	SC	SIPAN 32X	SC	SIPAN 32X			SC		SC/MONEC	SIPAN 32X	
Container/Tank; closed	SC	SIPAN 32X	SC	SIPAN 32X			SC		SC/MONEC	SIPAN 32X	
In-line Pipe Insertion	SC	SIPAN 32X	SC	SIPAN 32X					SC/MONEC	SIPAN 32X	
Flow-through	SC	SIPAN 32X	SC	SIPAN 32X			SC	SC/MONEC/SIPAN	SC/MONEC/SIPAN	SIPAN 32X	SC/MONEC

→ Data and order information about the sensors: see page 119



SIPAN 32X single channel controller with explosion proof and two-wire technology



MONEC single channel controller for analogue sensors

SC standard controllers—the digital platform

SC multi-channel controllers recognise digital sensors automatically. A large number of inductive and conductive sensors can be connected to SC controllers. SC controllers form a standard interface between operator and plant for single parameter solutions as well as in complex networks. They provide long-term operation and are cost effective.

→ Information about mounting devices for sensors: see page 144

Conductivity: conductive and inductive SC sensors

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- For highly contaminated fluids: inductive sensors
- For wastewater: 3798 sc digital immersion sensor with V4A housing
- For clean fluids: conductive sensors
- Factory calibrated
- Available in different materials and mounting kits



Analogue sensor
3700 series

Digital sensor
3798 sc family

Analogue sensor
3400 series

Inductive sensors

Inductive sensors are especially suitable for contaminated water and turbid fluids, as they are non-contact devices. They are used in environments ranging from municipal and industrial wastewater to concentrated acids and alkalis. The extensive sensor programme offers all options for installation with digital or analogue controllers.

Conductive sensors

The advantage of conductive sensors is their great precision and sensitivity. They are especially suitable for use in drinking water, ultrapure water or slightly contaminated process water. The wide range of sensors makes installations with digital or analogue controllers possible.

The benefits

Whether inductive or conductive: the high-quality HACH LANGE conductivity probes offer maximum operational reliability and digital signal transmission. The use of a variety of materials enables measurements to be carried out in almost every medium. They can be easily combined with other digital probes through SC controllers.



SC 100 controller:
Up to two SC probes can be connected



More information at www.hach-lange.co.uk, www.hach-lange.com, keywords "conductivity process" with free downloads of various brochures, user manuals, etc.

- Data and order information about the conductivity sensors: see page 119
- Mounting kits for the conductivity sensors: see page 144
- More about SINGLET buffers: see page 28

Oxygen monitoring: applications and solutions

Oxygen has a very special role in the biological treatment of wastewater. The degradation of organic substances depends on it, as does nitrification. Denitrification, on the other hand, only takes place under anoxic conditions. Oxygen depletion can completely tip the ecological balance of surface waters. In all cases, an effective aeration strategy requires precise and reliable oxygen sensors. HACH LANGE's LDO technology, launched just a few years ago; has convincingly demonstrated its vast superiority over conventional electrochemical analysis.

Oxygen applications

SOLUTIONS FOR	WASTEWATER					PROCESS WATER				DRINKING WATER
Measurement location	Industrial inflow	Municipal inflow	Active sludge tank	Digester	Outflow	High-purity water/power generation	Production	Production, Ex	Beverages	Drinking water
Container/Tank; open			SC USC		SC USC		SIPAN	SIPAN 32X		
Container/Tank; closed			SC USC		SC USC		SIPAN	SIPAN 32X		
In-line Pipe Insertion							SIPAN	SIPAN 32X	SIPAN	
Flow-through							SIPAN	SIPAN 32X	SIPAN	LDO/ EVITA OXY

→ Data and order information about the sensors: see page 120



SIPAN 32X one-channel controller with explosion protection and two-wire technology



USC 5000 single channel controller for EVITA OXY

SC standard controller—the digital platform

SC multi-channel controllers recognise digital sensors automatically. The LDO sensor and conventional electrochemical sensors (5740 sc) can be connected to it. SC controllers form a standard interface between operator and plant for single parameter solutions as well as in complex networks. For long-term operation and cost effectiveness.

→ Mounting kits for the sensors: see page 144

Ideal way to measure oxygen: LDO

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- No more calibration
- No more electrolyte changes
- No need for sample to be kept in motion
- No H₂S poisoning
- Economically efficient aeration due to drift-free sensor
- 2-year warranty on the sensor cap



The LDO (luminescent dissolved oxygen) sensor measures dissolved oxygen by an optical method.

The ideal measurement method

The LDO method measures the time of a light pulse emitted in response to an excitation pulse. Since the method measures the oxygen-dependent time interval, it is not susceptible to interference in any form. Years of experience have shown that the LDO method completely overcomes the disadvantages of conventional electrochemical methods.

The practical benefits

The optical principle ensures that the LDO sensor delivers consistently precise measured values. It eliminates the need for calibration, changes of membrane and electrolyte, and the laborious replacement of wear parts. A simple change of sensor cap every two years is sufficient to keep the LDO sensor functioning reliably and drift free.

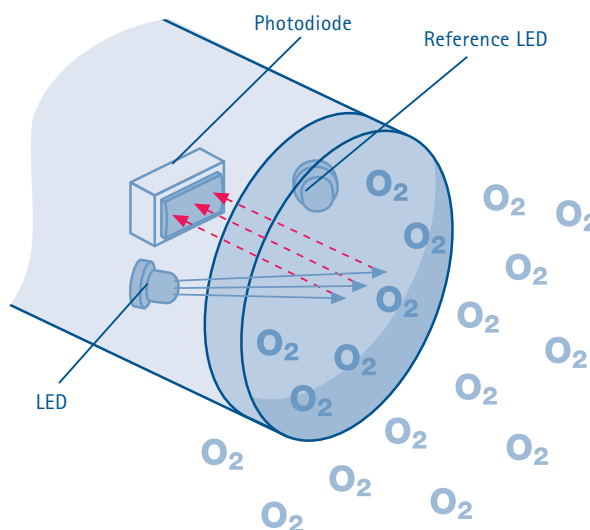
Cost cutting potential

With very low maintenance and operating requirements of the LDO method, the LDO is cost effective. Plus the long-term stability of the measured values equates to increased process reliability and lower consumption of aeration energy in municipal and industrial sewage treatment plants.



SC 100 Controller:
Up to two SC probes can be connected

The LDO sensor cap is excited by blue light and emits a red light. This optical effect is known as luminescence. The LDO sensor measures the interval of the red light.



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More information at www.hach-lange.co.uk, www.hach-lange.com, keywords "LDO Process" with free downloads of brochures (DOC033.52.03208) and User Manual (DOC023.52.03212)

Low maintenance oxygen measurement: EVITA OXY

- Automatic calibration
- No regeneration necessary
- Easy to change sensor
- Excellent accuracy and interference resistance for many years
- Directly connectable to a PLC



OXY 4100 transmitter with OXY 1100 sensor; automatic calibration is carried out by simply tilting the probe (TILTCAL system) and only has to be done three times for five minutes each year.

Comprehensive system

The EVITA OXY probe for determining dissolved oxygen consists of an OXY 1100 oxygen sensor and a transmitter, which can be either the ball float OXY 4100 or the rod-shaped OXY 4150. Mounting brackets and a USC universal signal converter complete the system. It is especially suitable for controlling aeration in sewage treatment plants and aquacultures.

Low maintenance

EVITA OXY requires less than 30 minutes of maintenance time per year! This is due to the special design of the OXY 1100 sensor; the spherical body with "fins" resists bacterial growth, so there is no time-consuming manual cleaning.

Exact and long-lived

A special benefit of EVITA OXY is its accuracy over a period of many years. The OXY 1100 sensor, consisting of electrolyte, membranes and electrodes, is simply replaced every two to three years. The procedure reliably excludes any handling difficulties and consequent measurement errors.

Technical data of EVITA OXY

TRANSMITTER	OXY 4100	OXY 4150
Probe type	Float with constant distance to water surface	Rod
Measuring range	Oxygen: 0–500%, 0–50 mg/l; temperature: 0–60 °C	
Accuracy	Oxygen ± 0.5% of scale end value; temperature ± 0.5 °C	
Reaction time	50 µm membrane: t = 22 sec; 25 µm: t = 7 sec ; 50 µm membrane: t = 110 sec	
Calibration	Automatic with TILTCAL; automatic temperature and pressure compensation when a USC universal signal converter is used	
Cable	Shielded cable, 2 x 0.75 mm	
Current output	4–20 mA scaleable, analogue or digital through HART communication, galvanic isolated, max. load: 750 W at 30 V DC	
Protection rating of housing	IP 68 (1 m)	IP 68 (10 m)
Operation temperature	Air: –40 to 60 °C; Measured medium: 0 to +40 °C	
Power supply	12–30 V DC	
Housing material	PBT/PC	
Dimensions/weight	d = 240 mm; 2 kg	d = 50 mm, length 180 mm; 1 kg
SENSOR OXY 1100	Replaceable Clark sensor for dissolved oxygen, typical lifetime 2–3 years	

- Order information about EVITA OXY probes and sensors: see page 120
- Mounting brackets for EVITA OXY on request
- EVITA OXY can be connected to a SC controller



More information at www.hach-lange.co.uk, www.hach-lange.com, keywords "EVITA OXY" with free downloads of brochure (DOC063.52.00460) and User Manual (DOC023.52.00076)

Sensors for pH, redox, conductivity and oxygen

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CONDUCTIVITY	Materials	Max. temperature	Max. pressure	SC controller, digital (with gateway = GW)	USC controller, analogue	SIPAN 32X controller, analogue	MONEC controller, analogue	ARTICLE NO.
Inductive sensors								
3798-S sc sensor, immersion probe with 10 m cable and integrated AD electronics	Stainless steel	100 °C	2 bar	●				LXV428.99.00001
3700 sc sensor, hygienically clean for sanitary applications, immersion or flow-through probe consisting of analogue sensor with 6 m cable and digital gateway with 1 m connection cable for SC controller	PFA Teflon	115 °C	13.8 bar	●GW				D3708E2T.99
3700 sc sensor, convertible, immersion or flow-through probe consisting of analogue sensor with 6 m cable and digital gateway with 1 m connection cable for SC controller	PP	115 °C	6.9 bar	●GW				D3725E2T.99a
	PEEK	115 °C	13.8 bar	●GW				D3727E2T.99
Analogue sensor for explosion-protected areas, EEx ia IIC T4, flow-through probe with PT100 temperature sensor and 5 m cable	FEP	130 °C	10 bar			●Ex		7MA22008EB
Conductive sensors , analogue, with digital gateway (AD 3400 sc) for SC controller; with 5 m cable between sensor and gateway and 1 m cable to controller, flow-through probe with integrated PT 100 temperature sensor								
Type 3410 for clean fluids, K=0.01 cm ⁻¹ , 0-20 µS/cm	Stainl. steel/Polyester	125 °C	10 bar	●GW				D3410.99
Type 3411 , K=0.1 cm ⁻¹ , 0-200 µS/cm	Stainl. steel/Polyester	125 °C	10 bar	●GW				D3411.99
Type 3412 , K=1.0 cm ⁻¹ , 0-2,000 µS/cm	Graphite/Polyester	125 °C	10 bar	●GW				D3412.99
Type 3415 , K=0.01/cm, 0 - 20 µS/cm	Stainl. steel/SST 316 L	150 °C	25 bar	●GW				D3415.99
Type 3416 for high temperatures, K=0.1 cm ⁻¹ , 0-20 µS/cm	Stainl. steel/SST 316 L	150 °C	25 bar	●GW				D3416.99
Type 3417 for high temperatures, K=1.0 cm ⁻¹ , 0-20 µS/cm	Graphite/SST 316 L	150 °C	25 bar	●GW				D3417.99
Type 3494 , hygienically clean for sanitary applications, 1.5", K=0.01/cm, 0-20 µS/cm	Stainless steel	150 °C	10 bar	●GW				D3494C.99
Type 3494 , hygienically clean for sanitary applications, 2.0", K=0.01/cm, 0-20 µS/cm	Stainless steel	150 °C	10 bar	●GW				D3494D.99
Conductive 2-pole sensor , analogue, with quick disconnect plug for connection to SIPAN 32X or MONEC controller, flow-through probe with integrated PT 100 temperature sensor								
Type 8310 , K=0.01 cm ⁻¹ ; 0.01-200 µS/cm	Stainl. steel/Polyester	125 °C	10 bar			●Ex	●	Z08310=A=0000
Type 8311 , K=0.1 cm ⁻¹ ; 0.1-2 mS/cm	Stainl. steel/Polyester	125 °C	10 bar			●Ex	●	Z08311=A=0000
Type 8312 , K=1 cm ⁻¹ ; 1 µS/cm-20 mS/cm	Graphite/Polyester	125 °C	10 bar			●Ex	●	Z08312=A=0000
Type 8315 , K=0.01 cm ⁻¹ ; 0.01-200 µS/cm	Stainl. steel/SST 316 L	125 °C	25 bar			●Ex	●	Z08315=A=0000
Type 8316 , K=0.1 cm ⁻¹ ; 0.1 µS/cm-2 mS/cm	Stainl. steel/SST 316 L	125 °C	25 bar			●Ex	●	Z08316=A=0000
Type 8317 , K=1.0 cm ⁻¹ ; 1 µS/cm-20 mS/cm	Graphite/SST 316 L	125 °C	25 bar			●Ex	●	Z08317=A=0000
Type 8394 for sanitary applications, 1.5", K=0.01 cm ⁻¹ ; 0.01-200 µS/cm	Stainless steel	125 °C	10 bar			●Ex	●	Z08394=A=1511
Type 8394 for sanitary applications, 2", K=0.01 cm ⁻¹ ; 0.01-200 µS/cm	Stainless steel	125 °C	10 bar			●Ex	●	Z08394=A=2011
Conductive 4-pole sensor , ex-protected areas, with integrated PT 100 temperature sensor, measuring range 0-500 mS/cm, DN50 nut, immersion or flow-through probe	Epoxy resin/ Graphite	100 °C	6 bar			●Ex		7MA21008BC

pH-VALUE

Digital sensors (additional sensors on request)								
1200 S sc digital pH sensor for wastewater, immersion probe, with integrated AD electronics and exchangeable pH combination electrode, with 10 m cable	Stainless steel/Glass	50 °C	2 bar	●				LXV426.99.10001
pHD S sc digital differential pH sensor, immersion probe with integrated AD electronics, with 10 m cable	Stainless steel/Glass	50 °C	2 bar	●				LXV427.99.10001
Differential pH sensor , convertible, immersion, flow-through or built-in probe with integrated AD electronics, with 10 m cable	PEEK/Glass	70 °C	6.9 bar	●				DPD1P1.99
8362 sc pH flow-through system for ultrapure water, pH measuring range 2-12, with pH sensor, flow-through vessel, 3 m cable and temperature sensor	Glass	80 °C	4 bar	●				6178002
AD 1200 sc digital gateway for connecting analogue pH and redox sensors to the SC controller; separate digital extension cable needed								6120500.99

K = Cell constant; FEP = Tetrafluorethylene-perfluoropolymer; PFA = Perfluoroalkoxy polymer;

PP = Polypropylene; PEEK = Polyetheretherketone

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pH-VALUE (CONTINUING)

	Materials	Max. temperature	Max. pressure	SC controller, digital (with gateway = GW)	USC controller, analogue	SIPAN 32X controller, analogue	MONEC controller, analogue	ARTICLE NO.
Analogue sensors (for use with SC controller a gateway is necessary)								
Type 8350 pH electrode, immersion, flow-through or built-in probe with 3/4" NPT thread, 10 m cable and temperature sensor	PPS, glass, PTFE diaphragms	110 °C	10 bar	●GW	●Ex	●		Z08350=A=0000
pH electrodes with gel electrolyte for drinking water, process water, general applications, PG13.5 thread	Glass	100 °C	2.5 bar	●GW	●Ex	●		Z368418,00000
Type 8416 pH electrode with pressurised gel, industrial applications, for high pressures and low pH, for samples containing proteins, sulphides, emulsions, suspensions; d 12 mm, PG13.5 thread, XEROLYT reference system without temperature sensor	Glass	110 °C	16 bar	●GW	●Ex	●		Z368416,00000
PHPULPPT100 pH electrode for wastewater, built-in probe with 5 m cable and PT100 temperature sensor	Stainless steel/Glass	135 °C	10 bar	●GW	●Ex	●		LZX475
pH electrode with polymer electrolyte for drinking water and process water, flow-through probe with PG13.5 thread and PT1000 temperature sensor with quick disconnect plug	Glass	100 °C	10 bar	●GW	●Ex	●		LZY027
PRO140PT100 pH electrode for process water, with gel electrolyte, PG13.5 thread, with PT1000 temperature sensor and 10 m cable	Glass	135 °C	34 bar	●GW	●Ex	●		LZX546

REDOX

1200 S sc digital redox sensor for wastewater, immersion probe with 10 m cable, with integrated AD electronics and exchangeable redox combination electrode	Stainless steel/Platinum	50 °C	2 bar	●				LXV426.99.20001
pHD S sc digital differential redox sensor for wastewater, immersion probe with integrated AD electronics, with 10 m cable	Stainless steel/Platinum	50 °C	2 bar	●				LXV427.99.20001
Digital differential redox sensor , convertable, as immersion, flow-through or built-in probe, with integrated AD electronics, with 10 m cable	PEEK/Platinum	70 °C	6.9 bar	●				DRD1P5.99
Analogue redox sensor , with PG13.5 thread, gel electrolyte	Platinum/ceramic diaphragm	100 °C	6 bar	●GW	●Ex			LZY028
Type 8351 analogue redox sensor, with 3/4" NPT thread, with 10 m cable and temperature sensor	PPS /Platinum/PTFE Diaphragm	110 °C	10 bar	●GW				Z08351=C=0000
AD 1200 sc digital gateway for connecting analogue pH and redox sensors; for details see conductivity								6120600.99

OXYGEN

LDO Sensor for (waste)water, measuring range 0.1–20 mg/l, immersion or flow-through probe, optical (luminescence) measuring method, calibration-free, drift-free, maintenance-free, with PT100 temperature sensor	NORYL stainless steel 1.4401	50 °C		●				LXV416.99.00001
Spare sensor cap for LDO; replace every two years				●				5791100
5740 sc Sensor , measuring range 0.1–40 mg/l, immersion or flow-through probe, galvanic measurement method, with NTC temperature sensor	Sensor: NORYL O-ring: Viton; membrane: PP	50 °C		●				LXV425.99.00001
OXY system package 3 , measuring range 0.1–10 mg/l, immersion probe; consisting of OXY 4100 ball float transmitter (085G4062.72.001), OXY 1100 sensor (085G0022), mounting brackets (085G4085)		75 °C			●			085G4004.72.001
Amperometric electrode for residual oxygen, 0.1–2,000 ppb, with NTC temperature sensor		45 °C					●	Z09182=A=1000
OXYSENS sensor , measuring range 40 µg/l–20 mg/l, immersion, built-in or flow-through probe, ex-protected area, ATEX II 1/2G EEx IA II C T4/T5/T6	Stainless steel 1.4435 EPDM seal	60 °C	4 bar		●Ex			LZY078
OXYGOLD sensor for ultrapure water, immersion, built-in or flow-through probe, ex-protected area, ATEX II 1/2G EEx IA II C T4/T5/T6	Stainless steel 1.4435 EPDM seal	130 °C	12 bar		●Ex			LZY072

EPDM = Ethylen-Propylen-Dien; PEEK = Polyetheretherketone; PPS = Polyphenylene sulphide; PTFE = Polytetrafluoroethylene

→ **SC 100 controller:** for more information see page 97
A maximum of 2 additional probes can be connected
→ **Additional sensors, accessories and fittings on request**

→ **SC 1000 Controller:** for more information see page 98
Up to 8 SC probes can be connected

Optimal control and monitoring of nutrient parameters

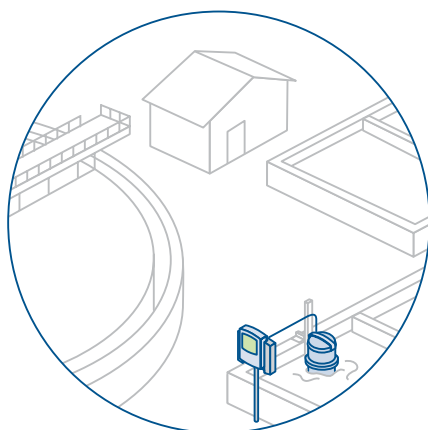
Ammonium, nitrate and phosphate measurement is crucial in wastewater treatment. In municipal and industrial sewage treatment plants, the reliable measurement of these variables is the basis for all control concepts. The nutrient parameters also play a central role in the monitoring of surface waters and in drinking water treatment plants. HACH LANGE has the solution for every user requirement profile, with process probes and analysers can be installed on-site and in-house.

The right nutrient sensor for each application

Installation location	NH ₄	NO _x	PO ₄ , P _{Ges}
IN-SITU Immersed in the fluid	 <p>EVITA 4100 Ammonium analyser See page 127</p>	 <p>NITRATAX sc Nitrate probe See page 128</p>	 <p>EVITA 4100 Phosphate analyser See page 131</p>
	 <p>AMMON eco sc Ammonium probe See page 126</p>	 <p>EVITA 5100 Nitrate analyser See page 130</p>	
ON-SITE On the side of the tank	 <p>AMTAX sc Ammonium analyser See page 124</p>		 <p>PHOSPHAX sc Phosphate analyser See page 132</p>
IN-HOUSE In the measurement station	 <p>AMTAX inter2 Ammonium analyser See page 125</p>	 <p>NITRATAX sc Nitrate probe in the bypass See page 128</p>	 <p>PHOSPHAX sigma Sigma total phosphorus analyser See page 133</p>

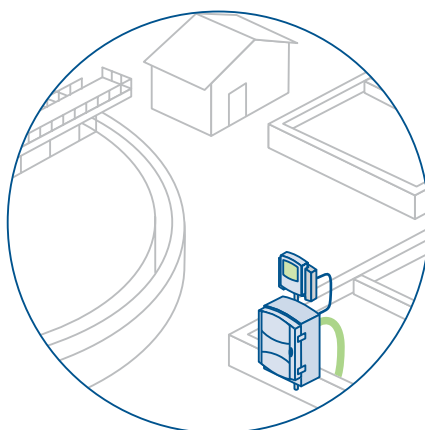
Installation and sample preparation for NH₄, NO_x and PO₄ process measurements

Measurement quality values depends on the first steps in the analysis process; sampling and sample transport. Every interference factor must be avoided, and the most suitable solution for the individual case must be selected. From installation to sample preparation and measurement technology, we ensure accurate results and reliable operation.



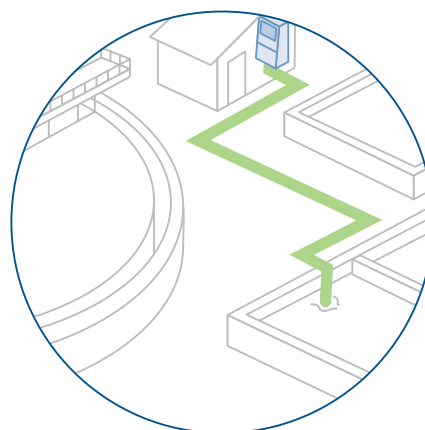
In-situ (in-fluid) measurement

There are advantages to carrying out measurements in the fluid. The sample does not have to be transported, so there is no risk of the measurement values being distorted by any biological or chemical changes to the sample during transport. Alongside proven probes such as NITRATAX sc, analysers such as the EVITA INSITU 4100 are now available and suitable for this application. The reagents are in a watertight cartridge and have to be replaced only once every 10 weeks. The sample preparation is carried out via an ion-selective membrane, which holds back all undesirable elements of the sample.



On-site (tank-side) measurement

Analysis at the side of the tank combines the advantages of minimal sample transport distance and directly accessible analysis. This concept is reflected in the AMTAX sc and PHOSPHAX sc analysers. No changes occur in the sample before it is analysed, and the analysis equipment is directly accessible at all times in the watertight housing—e.g. for a clean change of reagents, unaffected by pollutants. Together with the self-cleaning sample preparation system, on-site, tank-side analysers can be integrated everywhere, without any need to carry out structural work.



In-house measurement

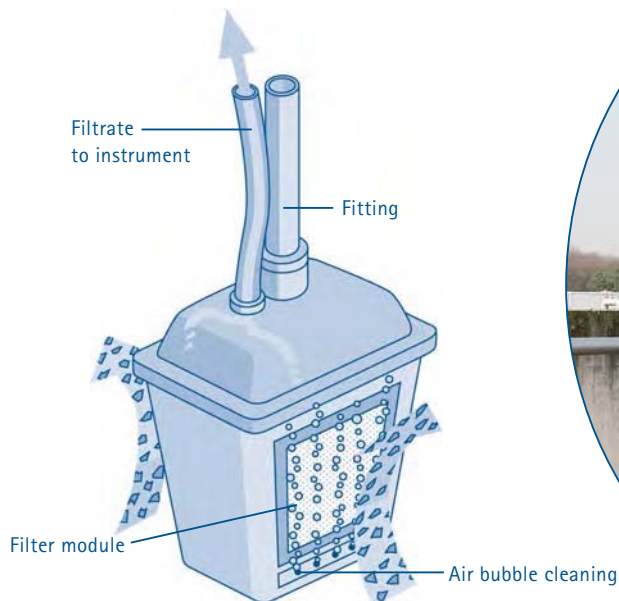
In-house installation means simple integration in measurement stations. This is proven with the AMTAX inter2 and AMTAX compact ammonium analysers. Also with the PHOSPHAX sigma and PHOSPHAX compact analysers for total phosphorus and orthophosphate. In-house installation offers protection against the weather for both analysers and employees. The appropriate sample preparation, filtration or homogenisation ensures a long service life and low operating costs.

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On-site (tank-side)



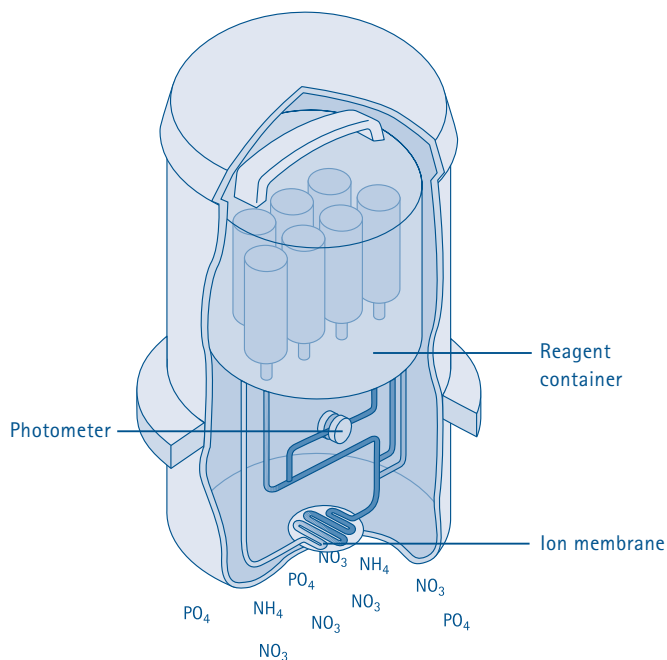
Low-maintenance: The immersed filter probe takes samples continuously. Air bubbles prevent coatings from forming on the filter module.



On-site installation at the side of the tank means measurements with the shortest possible route, so that the sample undergoes no changes before it is analysed.

The complete system, consisting of the analyser and filter probe, is easily accessible at all times.

In-situ (in the fluid)



In-situ installation in the fluid means no sample transportation, thus reducing chances of interference. The special ion membrane enables interference-free ISO-compliant measurements to be carried out with the minimum of maintenance.



Selective: No coating forms on the antibacterial ion membrane during operation. The membrane allows only the required ions to pass through it; bacteria and other particles cannot reach the analyser.

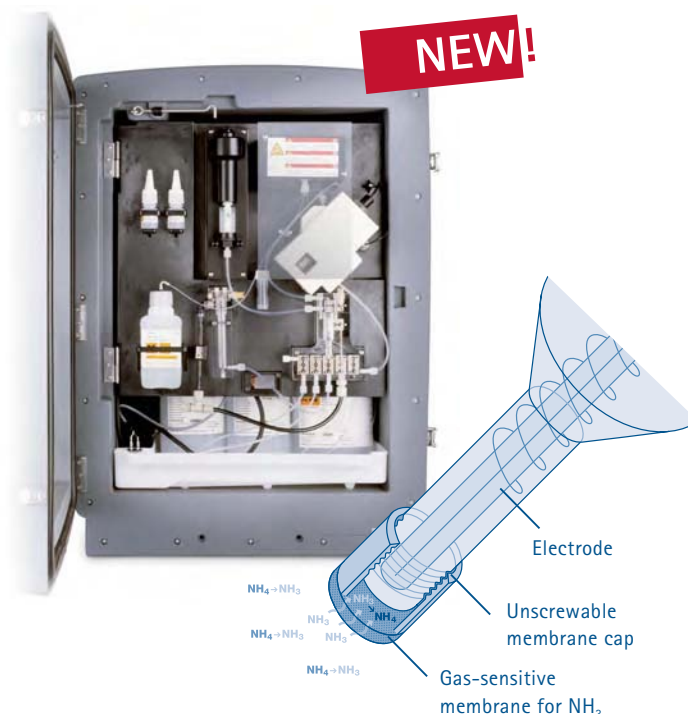
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AMTAX sc—the flexible NH₄ analyser for on-site measurement

- Installed at the side of the tank when required
- With integrated filter probe
- Simple handling and operation
- Accurate and easily accessible analysis
- Weatherproof

On site—where you need it

AMTAX sc is the successor to the proven AMTAX analysers. It can be mounted locally at the measuring point, without any need for additional accessories. The sample can be analysed before any degradation. The GSE technology guarantees wide measuring ranges.



AMTAX sc uses a gas-sensitive electrode (GSE). Only a few minutes are needed to exchange the screwed-on membrane cap and electrolyte.

Technical data for AMTAX sc, model no. LXV421

Measurement method	GSE (gas-sensitive electrode)		
Measuring ranges	0.05-20.0 mg/l NH ₄ -N	1.0-100 mg/l / NH ₄ -N	10-1,000 mg/l NH ₄ -N
Accuracy	3% ± 0.05 mg/l	3% ± 1.0 mg/l	4.5% ± 10 mg/l
Response time T90	5 min including sample preparation		
Measurement interval	5-120 min		
Special features	Automatic cleaning and calibration, comprehensive self-diagnostics		
Installation	Can be mounted on a wall, a rail or a stand, indoors or outdoors (IP 55)		
Temperature	Sample +4 – +40 °C, ambient –20 – +45 °C		
Operation, outputs	Through SC Controller, outputs mA, relay, bus		
Sample preparation	Integrated filter probe and continuous sample preparation, e.g. with FILTRAX		
Supply voltage	230 V AC/50 Hz (optional 115 V AC, 50-60 Hz), connection to SC 1000 Controller		
Dimensions, weight	540 x 720 x 390 mm (W x H x D), 31 kg including reagents		



SC 1000 Controller:

AMTAX sc and a maximum of seven additional SC probes can be connected.

→ For more information see page 98

Technical data for filter probe for AMTAX sc/PHOSPHAX sc

Functional principle	In-situ membrane filtration; exchangeable filter module
Options	Heated sample tube, 5 m or 10 m
Special features	Continuous self-cleaning with air bubbles
Maintenance	Typically 30 min/month
Installation	Mount in tank or channel (IP 68)
Dimensions, weight	315 x 250 x 120 mm (W x H x D), 8 kg

→ Illustration of filter probe and description of how it works: see page 123

→ Order information about AMTAX sc, reagent and wear part kits and filter probe: see page 126

→ More information about mounting devices for AMTAX sc: see page 144

AMTAX inter2—the ISO compliant NH₄ analyser for in-house measurement

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- High accuracy, high precision
- Fast measured values – every 5 or 10 minutes
- For automated nitrogen elimination
- Automatic rinsing and calibration
- EN ISO 11732 compliant

Low maintenance

The AMTAX inter2 analyser was designed for the precise determination of ammonium, e.g. for optimising nitrification, for monitoring processes in sewage treatment plants, and for monitoring surface waters. It uses the standard indophenol blue method. The intermittent operating mode guarantees fast measurement.

The **AMTAX compact** process photometer uses the expulsion method with photometric pH indication. It is especially suitable for small sewage treatment plants.



The AMTAX inter2 and AMTAX compact (not shown) process photometers belong to a comprehensive system of integrated components with low-maintenance FILTRAX sample preparation and ready-to-use reagent and wear part kits.

Technical data for the AMTAX inter2

Art. no.	LPV397.00.X1001
Measurement method	Indophenol blue method based on EN ISO 11732
Measuring ranges	20: 0.1–20.0 mg/l NH ₄ -N (X=0)
20/80/2	80: 1.0–80.0 mg/l NH ₄ -N (X=1)
(Article no.)	2: 0.02–2.00 mg/l NH ₄ -N (X=2)
Accuracy	Measuring ranges 20/80: ± 2% of measured value ± 0.02 mg/l NH ₄ -N Measuring range 2: ± 4% of measured value ± 0.02 mg/l NH ₄ -N
Measurement interval	5 or 10 min, selectable
Reagent supply	Approx. 1 month (5 min interval between measurements); Approx. 2 months (10 min interval between measurements)

Calibration	Automatic
Cleaning	Automatic
Display	Graphic display showing progress curve
Sample criteria	Solids-free; at least 100 ml/hour
Maintenance	Typically 1 hour/month
Sample preparation	In-situ filtration with FILTRAX
Temperature	Ambient +5 °C – +40 °C
Port	Bus-compatible (optional)
Protection rating	IP 54
Dimensions, weight	550 x 1,190 x 390 mm (W x H x D), approx. 42 kg

- For more information about FILTRAX sample preparation for AMTAX inter2 see page 134
- For more information about reagent and wear part kits for AMTAX inter2 see page 126



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "AMTAX", with free downloads of brochures (AMTAX sc: DOC033.52.00430) and User Manuals (AMTAX sc: DOC023.52.00025, AMTAX inter2: DOC023.52.03107, AMTAX compact DOC023.52.03101)

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AMMON eco sc—the NH₄ ISE probe for in-situ measurement



NH₄ measurement in wastewater
with low investment costs

Simple to use: Continuous NH₄ measurement with ISE

The AMMON eco sc probe is suitable for determining ammonium in sewage treatment plants. This is low cost measurement technology, especially when used in small sewage plants. The concentration is monitored continuously by means of an ion-selective electrode immersed directly in the wastewater. The robust precalibrated sensor head with integrated potassium compensation is the only wear part.

Reagents and accessories AMTAX sc, AMTAX inter2, AMMON eco sc

For AMTAX sc and filter probe

Reagent kit 0.05–20.0 mg/l NH ₄ -N (annual requirement 4 kits (5 min), 2 kits (10 min))	LCW865
Reagent kit 1.0–100 mg/l NH ₄ -N (annual requirement 6 kits (5 min), 3 kits (10 min))	LCW871
Reagent kit 10.0–1,000 mg/l NH ₄ -N (annual requirement 6 kits (5 min), 3 kits (10 min))	LCW866
Cleaning solution (annual requirement 12)	LCW867
Special electrode (changed annually)	LZY069
Electrode maintenance kit: 3 membrane caps, 3 x electrolyte (annual requirement 2 kits)	LCW868
Filter module for filter probe	LZY140
AMTAX sc 0.05–20.0 mg/l NH ₄ -N, 5 m filter probe, 230 V AC	LXV421.99.11001
AMTAX sc 1.0–100 mg/l NH ₄ -N, 5 m filter probe, 230 V AC	LXV421.99.21001
AMTAX sc 0.05–20.0 mg/l NH ₄ -N, 1-channel version continuous sample	LXV421.99.13001
AMTAX sc other measuring ranges	On request
AMTAX sc 2-channel versions or supply voltage 115 V AC	On request

For AMTAX inter2

Wear parts kit, 1 channel (annual requirement 1 kit)	LZV281
Reagent kit (annual requirement 7 kits; at 5 min measurement interval 13 kits)	LCW802
Zero solution (annual requirement 1 container)	LCW804
Cleaning solution (annual requirement 1 container)	LCW819
Standard solution, 5 l, for AMTAX inter2, measuring range 20: 5 mg/l NH ₄ -N (annual requirement 1 container)	LCW803
Standard solution, 5 l, for AMTAX inter2, measuring range 80: 35 mg/l NH ₄ -N (annual requirement 1 container)	LCW808
Standard solution, 1 l, for AMTAX inter2, measuring range 2: 0.5 mg/l NH ₄ -N (annual requirement 4 containers)	LCW862

For AMMON eco sc

AMMON eco sc probe, ISEs for NH ₄ and K, pH reference, measuring range 0.2–100 mg/l NH ₄ -N, 30–1,000 mg/l NH ₄ -N, 1–1,000 mg/l K ⁺ , accuracy 5% ± 0.2 mg/l, response time < 2 min	LXV437.99.00001
Sensor head, precalibrated, service life typically 6 months	6188400
Accessories: Cleaning head for cleaning compressed air	LZY331

EVITA INSITU 4100—low maintenance NH₄ analyser for in-situ measurement

- No external sample preparation
- Measurements carried out directly in wastewater
- Simple reagent exchange
- Low maintenance
- ISO-compliant indophenol blue measurement method

In-situ measurement without external sample preparation

The EVITA INSITU 4100 analyser is immersed in the wastewater to carry out online measurements with quick response times. The EVITA INSITU 4100 is ideal for use in process control systems in sewage treatment plants. The reagents are supplied in easily exchangeable containers and are collected for disposal.



The special feature of the EVITA INSITU 4100 is the ion membrane. It makes conventional sample preparation superfluous.

Technical data for EVITA INSITU 4100 Ammonium

Art. no.	081B0039.XX.001	081B0040.XX.001
Measuring range	0.1–20 mg NH ₄ -N	0.3–100 mg NH ₄ -N
Accuracy	≥ 0.6 mg/l: ± 10%; < 0.6 mg/l: ± 0.06 mg NH ₄ -N	≥ 1 mg/l: ± 10%; < 1 mg/l: ± 0.1 mg NH ₄ -N
Response time	12 min ± 1 min	24 min ± 1 min
Measurement method	Indophenol blue	
Measurement interval	Continuous measurement	
Calibration	Automatic every 72 hrs (selectable) using internal standards	
Reagent change	15 minutes every 10 weeks	
Current output	4–20 mA, scalable by HART protocol, galvanic isolated, max. load: 750 ohm at 30 V DC	
Protection rating	IP 68	
Temperature	Air: -20 – +40 °C, fluid: 0 – +35 °C	
Supply voltage	20–28 V DC, 6 A	
Dimensions	350 mm diameter, 600 mm height; 15 kg	

Accessories and consumables

Reagent kit for NH ₄ -N, 0.1–20 mg/l	081B8032
Reagent kit for NH ₄ -N, 0.3–100 mg/l	081B8033
Ion membrane for NH ₄ -N, 1/pkg	081B8003
Ion membrane for NH ₄ -N, 10/pkg	081B8023



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "EVITA INSITU", with free downloads of brochures (DOC063.52.00458) and User Manuals (DOC052.52.00077) and information about mounting devices and USC controllers for EVITA INSITU 4100.

- For more information on how the EVITA ion membrane works see page 123
- For more information about the USC 6000 Controller for EVITA probes see page 130
- EVITA probes can be connected to the SC 1000 Controller.

NITRATAX sc—NO_x probes for in-situ measurement

- Reagent-free method
- No sampling or sample conditioning
- Measurement in activated sludge or in water
- Automatic self-cleaning
- Available as immersion or bypass probe



Direct measurement in the fluid

The key to nitrogen elimination

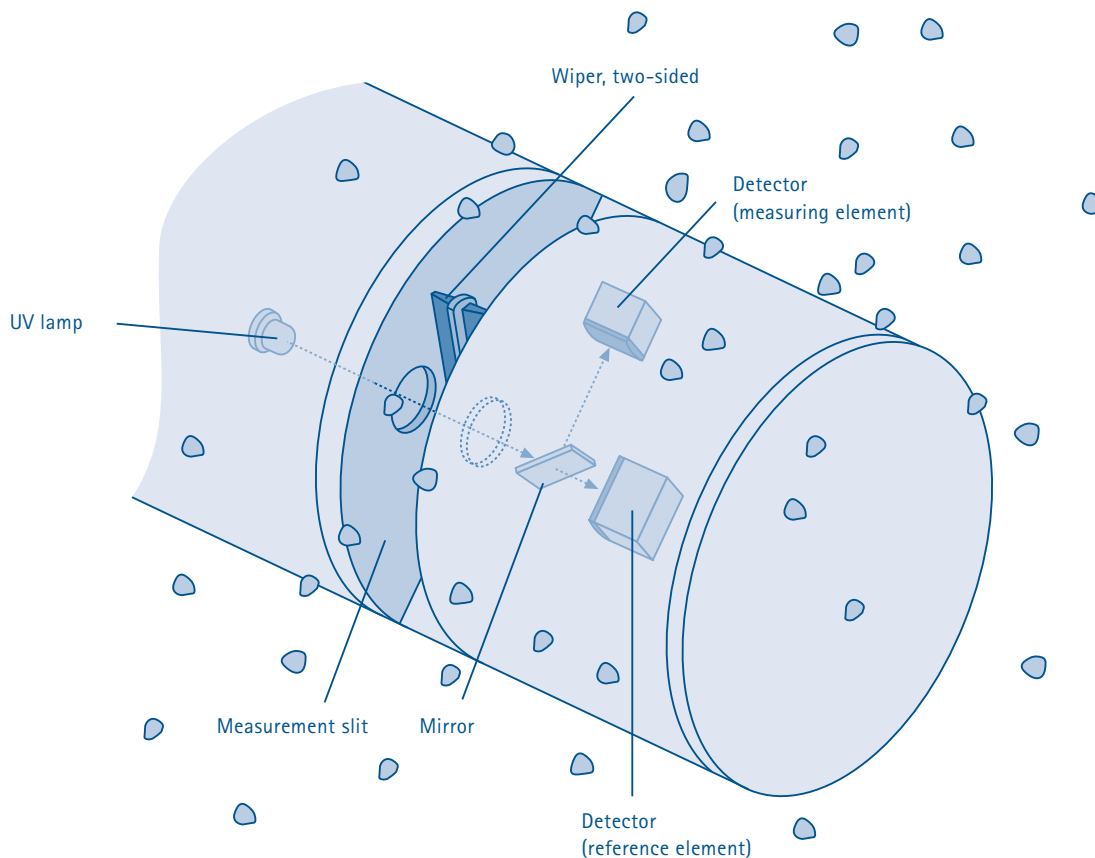
NITRATAX probes determine the concentration of nitrate directly in activated sludge, wastewater and surface water. The measurement is beneficial wherever nitrate has to be eliminated or consistently monitored: for process optimisation and for documentation of limiting values.

The NITRATAX principle: ingeniously simple

When dissolved in water, nitrate absorbs UV light. This means that the nitrate concentration can be determined photometrically in the fluid, without reagents, sampling or delays. NITRATAX probes benefit from low-maintenance operation and automatic turbidity compensation.

Direct measurement in the fluid

In many process steps, direct measurement of the nitrate concentration is beneficial for nitrate elimination and monitoring. With their application-specific features, the NITRATAX plus sc, NITRATAX eco sc and NITRATAX clear sc models are ideally configured to meet different requirements.



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NITRATAX sc—freely combinable with other probes through SC controller with plug + play technology

Applications for NITRATAX sc probes

	NITRATAX plus sc	NITRATAX eco sc	NITRATAX clear sc
Upstream denitrification	●	-	-
Aeration basin/aeration basin outflow	●	○	-
Plant outflow	●	-	●
Intermittent methods	●	●	-
Cascade	●	○	-

● Suitable ○ Possible - Unsuitable

Technical data for NITRATAX sc probes

	NITRATAX plus sc LXV417.99.X0001	NITRATAX eco sc LXV415.99.10001	NITRATAX clear sc LXV420.99.50001
Art.no.			
Measuring range (path length)	0.1–100 mg/l NO ₃ -N (1 mm, X = 1) 0.1–50 mg/l NO ₃ -N (2 mm, X = 2) 0.1–25 mg/l NO ₃ -N (5 mm, X = 5)	1–20 mg/l NO ₃ -N (1 mm)	0.5–20 mg/l NO ₃ -N (5 mm)
Measurement uncertainty	3% ± 0.5 mg/l	5% ± 1.0 mg/l	5% ± 0.5 mg/l
Dimensions (D x L), weight	70 x 333 mm, 3.6 kg	75 x 323 mm, 3.3 kg	75 x 323 mm, 3.3 kg
Measurement interval (≥ min)	1	5	1
T100 response time (min)	< 1	< 15	< 1
Sludge compensation	Yes	Yes	No
Also available for use in bypass	Yes	No	Yes
Maintenance time	Typically 1 hour/month		
Inspection interval	6 month		
Temperature	+2 – +40 °C		

Spare parts for NITRATAX sc probes

Wiper profiles 1 mm, 5 pkg	LZX148
Wiper profiles 2 mm, 5 pkg	LZX012
Wiper profiles 5 mm, 5 pkg	LZX117
Control standard 50 mg/l NO ₃ (11,3 mg/l NO ₃ -N)	LCW825
Control standard 100 mg/l NO ₃ (22,6 mg/l NO ₃ -N)	LCW825
Control standard 200 mg/l NO ₃ (45,2 mg/l NO ₃ -N)	LCW825



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "NITRATAX", with free downloads of brochure (DOC053.52.03222) and User Manual (DOC023.52.03211).

EVITA INSITU 5100—the NO_x analyser for in-fluid measurement

- No external sample preparation
- Measurements are carried out in the fluid
- Low maintenance
- Simply top up the carrier solution
- Self-cleaning

In-situ measurement no external sample preparation

The EVITA INSITU 5100 analyser is immersed directly in the wastewater—for online measurements with quick response times. The EVITA INSITU 5100 is ideal for process control systems in sewage treatment plants. The analyser functions without reagents, as it measures NO_x with the help of UV light. Only a carrier solution is needed.



The special feature of the EVITA INSITU 5100 is the ion membrane.

Technical data of the EVITA INSITU 5100 Nitrate/Nitrite

Art. no.	081B0014.XX.001
Measurement principle	UV absorbance
Measuring range	0.2–50 mg/l, quantity limit / 0.6 mg/l NO _x -N
Accuracy	2–50 mg/l: ± 10% of measured value; < 2 mg/l: ± 0.2 mg NO _x -N
Response time	13 min ± 1 min
Measurement interval	Continuous measurement
Calibration	Automatic, 1-point and 3-point calibration
Maintenance	Typically, change of carrier solution and ion membrane every 10 weeks
Current output	4–20 mA, scalable by HART protocol, galvanic isolated, max. load: 750 ohm at 30 V DC
Protection rating	IP 68
Temperature	Air: –10 – +35 °C, fluids: +2 – +30 °C
Supply voltage	20–28 V DC, 2 A
Dimensions, weight	300 mm diameter, 7 kg (dry), 9 kg (filled)

Accessories and consumables for EVITA INSITU 5100 Nitrate/Nitrite

ARTICLE	ARTICLE NO.
Carrier solution including cleaner solution, 5 l	081B8030
Ion membrane for NO _x , 1/pkg	081B8003
Ion membrane for NO _x , 10/pkg	081B8023
Calibration set, single: 0 mg/l NO ₃ -N, 5 l	081B8029
Calibration set, multiple: 0, 10, 40 mg/l NO ₃ -N, per 1 l	081B8031

Technical data of USC 6000 Controller for EVITA probes

DESCRIPTION	ART. NO.
3 x 16-character LCD display, supply voltage 115–230 V AC, 50–60 Hz, ambient temperature –40 – +60 °C, dimensions 140 x 610 mm (W x H), weight 7.5 kg, optional TMS module for remote communication	
USC 6000 outdoor housing, protection rating IP 67, 85–264 V AC	085G4140.72.001
USC 6000 19" technology, protection rating IP 20, 85–264 V AC	085G4142.72.001

- For an illustration and a description of how the EVITA ion membrane works, see page 123
- EVITA probes can be connected to the SC 1000 Controller
- For more information about mounting devices for EVITA probes see page 144

EVITA INSITU 4100—the PO₄ analyser for in-fluid measurement

- No external sample preparation necessary
- Measurements are carried out in the fluid
- Simple change of reagent
- Low maintenance
- Molybdenum blue measurement method conforms to ISO

Direct measurement no external sample preparation

The EVITA INSITU 4100 analyser is immersed directly in the wastewater—for online measurements with quick response times. The EVITA INSITU 4100 is therefore ideal for process control systems in sewage treatment plants. The reagents are supplied in an easily exchangeable container and are collected for disposal.



The special feature of the EVITA INSITU 4100 is the ion membrane.

Technical data of the EVITA INSITU 4100 orthophosphate

Art. No.	081B0042.XX.001	081B0043.XX.001
Measurement range	0.05–6 mg PO ₄ -P	0.7–15 mg PO ₄ -P
Accuracy	0.3–6 mg/l: ± 10%; < 0.3 mg/l: ± 0.03 mg PO ₄ -P	2.4–15 mg/l: ± 10%; < 2.4 mg/l: ± 0.24 mg PO ₄ -P
Response time	13 min ± 1 min	13 min ± 1 min
Measurement method	Molybdenum blue	
Measurement interval	Continuous measurement	
Calibration	Automatic, every 72 hours (selectable) with internal standards	
Change of reagents	15 minutes every 10 weeks	
Current output	4–20 mA, scalable by HART protocol, galvanic isolated, max. load: 750 ohm at 30 V DC	
Protection rating	IP 68	
Temperature	Air: –20 – +40 °C, fluids: 0 – +35 °C	
Supply voltage	20–28 V DC, 6 A	
Dimensions, weight	350 mm diameter, 600 mm height; 15 kg	



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "EVITA INSITU", with free downloads of brochures (EVITA 4100: DOC063.52.00458, EVITA 5100: DOC063.52.00459) and User Manuals (EVITA 4100: DOC023.52.00077, EVITA 5100: DOC023.52.00078) and information about mounting devices and USC controllers for EVITA INSITU.

Accessories and consumables

Reagent set for PO ₄ -P, 0.05–6 mg/l	081B8034
Reagent set for PO ₄ -P, 0.7–15 mg/l	081B8035
Ion membrane for PO ₄ -P, 1/pkg	081B8004
Ion membrane for PO ₄ -P, 10/pkg	081B8024

PHOSPHAX sc—highly flexible PO₄ analyser for on-site measurement

- Installed where required for measurement
- With optional integrated filter probe
- Simple handling and operation
- Accurate, reliable analysis
- Weatherproof

On site—at the right place in the process

PHOSPHAX sc is the more practical successor to the proven PHOSPHAX analysers. They can be mounted at the side of the tank, without any need for additional accessories. The sample can therefore be analysed before any degradation. The intrinsic colour of the wastewater is automatically compensated for—interference factors are reliably excluded.



PHOSPHAX sc makes use of the proven yellow method. It saves on reagents and therefore cuts operating costs.

Technical data for PHOSPHAX sc, model no. LXV422

Measurement method	Two-beam photometer with LEDs (yellow method)	
Measuring ranges	0.05–15.0 mg/l PO ₄ -P	1.0–50.0 mg/l PO ₄ -P
Accuracy	2% ± 0.05 mg/l	2% ± 1.0 mg/l
Response time T90	5 min including sample preparation	
Measurement interval	5–120 min	
Special features	Automatic cleaning and calibration, comprehensive self-diagnostics	
Installation	Can be mounted on a wall, a rail or a stand, indoors or outdoors (IP 55)	
Temperature	Sample +4 – +40 °C, ambient –20 – +45 °C	
Operation, outputs	Through SC Controller, outputs mA, relay, bus	
Sample preparation	Integrated filter probe and continuous sample preparation with FILTRAX	
Supply voltage	230 V AC/50 Hz (optional 115 V AC, 50–60 Hz), connection to SC 1000 Controller	
Dimensions, weight	540 x 720 x 390 mm (W x H x T), 31 kg including reagents	

Ordering information and reagents for PHOSPHAX sc

Reagent, 2 l (annual requirement 1.5/3 containers at 10 min/5 min measurement interval)	LCW869
Cleaning solution, 1 l (annual requirement 1 container at both measurement intervals)	LCW870
Filter module for filter probe	LZY140
PHOSPHAX sc 0.05–15.0 mg/l PO ₄ -P, 5 m filter probe, 230 V AC	LXV422.99.11001
PHOSPHAX sc 1.0–50.0 mg/l PO ₄ -P, 5 m filter probe, 230 V AC	LXV422.99.21001
PHOSPHAX sc 1.0–50.0 mg/l PO ₄ -P, 1-channel version continuous sample	LXV422.99.13001
PHOSPHAX sc for other measuring ranges	On request
PHOSPHAX sc 2-channel versions or supply voltage 115 V AC	On request

- For an illustration of the filter probe and a description of how it works see page 123
- For technical data see page 124



SC 1000 Controller:
PHOSPHAX sc and a maximum of seven additional SC probes can be connected.

→ For more information see page 98

PHOSPHAX sigma—the P-analyser for in-house measurement with digestion

WW
DW

- Measurement of total phosphorus and orthophosphate in 1 instrument
- Fast measurement in just 10 minutes
- Complete digestion
- Low consumption of reagents
- Automatic cleaning and calibration

Reliable outflow values

The PHOSPHAX sigma process photometer continuously analyses the two P parameters alternately. This enables phosphate elimination to be controlled on the basis of the orthophosphate concentration and enables limiting values in the outflow to be monitored on the basis of the total phosphorus concentration.



The PHOSPHAX sigma and PHOSPHAX compact (not shown) process photometers belong to a comprehensive system of integrated components—with SIGMATAX and FILTRAX sample preparation and ready-to-use sets of reagents and wear parts.

100% digestion of homogenised water samples

The analysis is carried out very precisely using the molybdenum blue method in conformity with the EN1189 standard. The unique chemical-thermal digestion method completes the digestion, including solids, within a few minutes.

PHOSPHAX compact: low maintenance with yellow method

The PHOSPHAX compact process photometer measures the orthophosphate content in water and wastewater by means of the yellow method. It requires very little maintenance.



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "PHOSPHAX", with free downloads of brochures (PHOSPHAX sc: DOC033.52.00430) and User Manuals (PHOSPHAX sc: DOC023.52.00026, PHOSPHAX sigma: DOC023.52.03113, PHOSPHAX compact: DOC023.52.03102)

Technical data for PHOSPHAX sigma

Art. no.	LPV341.00.10000
Description	PHOSPHAX sigma total phosphorus with orthophosphate
Measurement method	Phosphomolybdenum blue method with chemical-thermal digestion in conformity with the EN 1189 standard
Measuring range	0.01–5.0 mg/l total phosphorus; 0.01–5.0 mg/l orthophosphate
Measurement interval	10 min
Temperature	Ambient +5 – +40 °C
Inspection interval	3 months (corresponds to reagent supply)
Maintenance	Typically, 1 hour/month
Sample volume	100 ml/hour
Display	Graphic display with time course curves
Outputs	2 x 0/4–20 mA
Protection rating	IP 54
Power requirement	230 V AC, 50 Hz/ 215 V AC including cooling unit
Dimensions, weight	550 x 1,190 x 390 mm (W x H x T), approx. 43 kg without reagents

Reagents and wear parts for PHOSPHAX sigma

Description	Art.-no.
Reagent set comprising reagents A (with additional component), C and D (with additional component), 5 of each, 2l, annual requirement 4 containers	LCW823
Calibration standard 2 mg/l P, 500 ml, annual requirement 2 containers	LCW824
Wear part set, annual requirement 1 container	LZP959

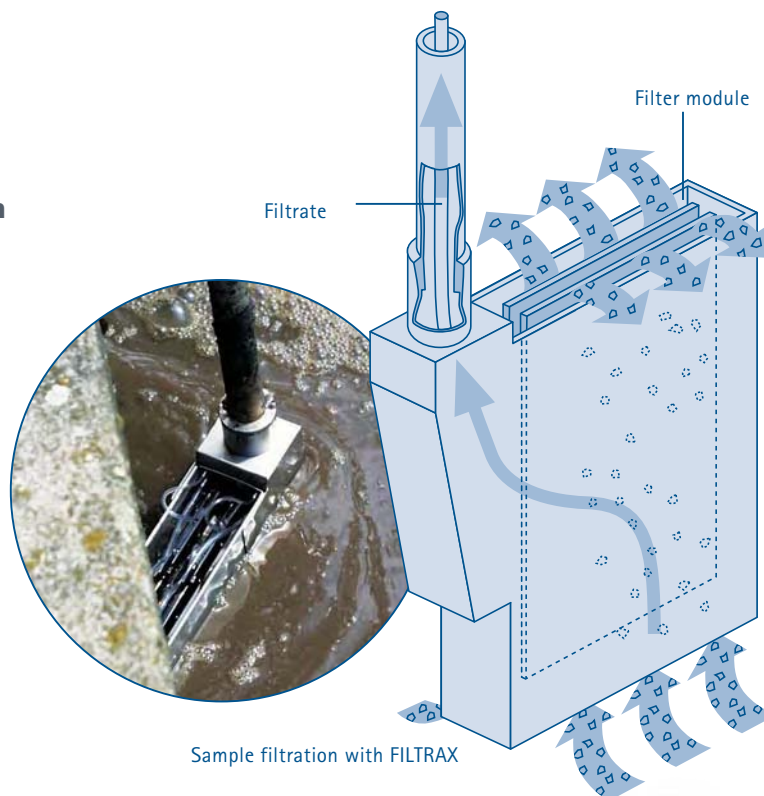
- Mounting devices for the PHOSPHAX process photometer, see page 144
- For more information about the SIGMATAX 2 and FILTRAX sampler instruments, see page 134

Unbeatable sampler filtration & measurement: FILTRAX + SIGMATAX 2

- **FILTRAX: low-maintenance, in-situ sample filtration**
- **SIGMATAX 2: homogenisation of original sample**

An unbeatable team: sampling and conditioning

Reliable sampling and sample conditioning are essential to the operation of process measurement instruments. Naturally the correct connection and close integration of the two systems is crucial.



FILTRAX—in situ filtration

The filter modules are mounted directly in the sample. The ultraclear filtrate is drawn off and pumped to the process measurement instruments. Continuous self-cleaning of the membranes ensures minimal maintenance and cleaning, giving a service life of several months.

SIGMATAX 2—homogenisation

SIGMATAX 2 provides the PHOSPHAX sigma and TOCTAX process photometers with ultrasonically homogenised original samples for the determination of total phosphorus and TOC. This enables the representative original sample, including solids, to be measured reliably and accurately.



SIGMATAX 2
sample preparation

Technical data for FILTRAX

Model No.	LXV294
Sample conditioning	Filtration
Sampling	From tanks or channels
Sample delivery	Peristaltic pump with volume monitoring
Hose length	Heated suction hose (5 m), Unheated pressure hose (2 m) or heated pressure hose (10 m, 20 m, 30 m)
Sample volume	Approx. 1 l/h; sufficient for up to 3 instruments (e.g. PHOSPHAX, AMTAX, bypass probes)
Protection class	IP 55; outside installation
Applications	Sampling from inflow, outflow, aeration basins in municipal and industrial wastewater treatment plants

Technical data for SIGMATAX 2

Model No.	LXV215
Sample conditioning	Ultrasonic homogenisation
Sampling	From tank or channel
Sample delivery	Compressed air
Hose length	10 m, 20 m, 30 m
Sample volume	For PHOSPHAX sigma and/or TOCTAX
Applications	Taking original samples from outflow of biological wastewater treatment systems; particle sizes < 0.5 mm

→ Mount kits for SIGMATAX 2 and FILTRAX: see page 144

Meaningful sum parameters: TOC and SAC254

Water and wastewater streams usually contain a host of substances. It is impossible to analyse all of them individually. The organic load of such streams is therefore generally determined by measuring sum parameters such as COD, BOD₅, TOC and SAC254. Two parameters are especially suitable for the continuous monitoring of organic load: TOC (conforms with EN 1484) and SAC (conforms with DIN 38404 C3).

Different substance groups

The sum parameters are measures of specific groups of substances in the water. The BOD₅ is a measure of the substances in the water that are susceptible to microbial oxidation, while the COD is a measure of the chemically oxidisable substances. The TOC is a measure of the total organic load, while the SAC is simply a measure of substances that absorb UV light.

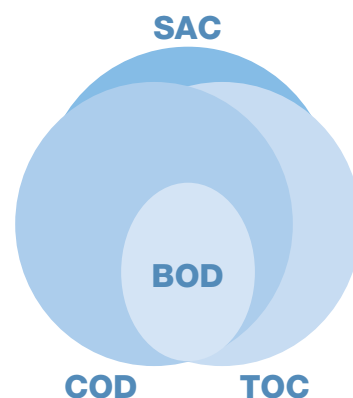
TOC

The total organic carbon in a sample is measured in conformity with EN 1484 as gaseous CO₂ in NDIR light after oxidation, or with UV light. If a sample contains solids, the standard requires the measurement to be carried out on the homogenised original sample. Depending on the application, another sample conditioning step may have to be carried out to ensure reliable operation.

SAC

The spectral absorption coefficient (SAC) is a measure of the dissolved organic load of a sample. It is determined in conformity with DIN 38404 C3 at a wavelength of 254 nm. The measurement is carried out directly in the original sample using a probe, quickly and without reagents.

PARAMETER	MEASURED VARIABLE	MEASUREMENT METHOD
TOC Total organic carbon	C concentration	Thermal/wet-chemical digestion
SAC Spectral absorption coefficient Dissolved organic substances	UV absorption at $\lambda = 254$ nm	UV-absorption measurement
BOD Biochemical oxygen demand	O ₂ consumption	Microbial oxidation
COD Chemical oxygen demand	O ₂ consumption	Wet-chemical oxidation



The sum parameters are measures of specific groups of substances in the water or wastewater

Continuous TOC measurement ideal for industrial conditions: ASTROTOC

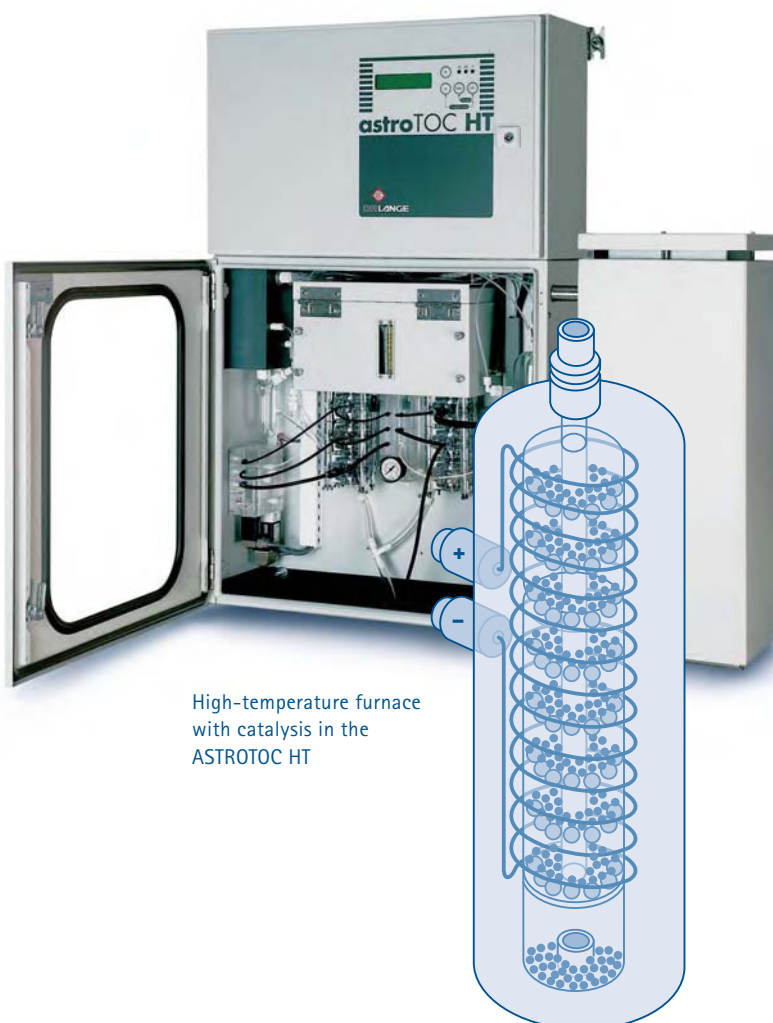
- Rugged construction
- Customer specific configurations
- Choice of 2 digestion methods
- Long service life

Flexible methods

ASTROTOC measures TOC in conformity with EN 1484. Two digestion methods are available. Depending on the application, a UV digestion or a high temperature digestion can be used. The gaseous carbon dioxide (CO₂) is then measured with a NDIR detector.

Wide range of configurations

With many measuring ranges, configurations and applications make ASTROTOC process analysers a flexible system for continuous TOC analysis. Their rugged design has proved to be especially suitable for industrial applications.



Technical data for ASTROTOC family

Model	ASTROTOC UV	ASTROTOC UV turbo	ASTROTOC HT
Measurement method	Wet-chemical digestion with peroxodisulphate and UV light, NDIR detection of CO ₂	Fast wet-chemical digestion with peroxodisulphate and UV light, NDIR detection of CO ₂	High-temperature incineration in furnace, NDIR detection of CO ₂
TOC measuring range	0 – 5 mg/l, 0 – 10 mg/l, 0 – 25 mg/l, 0 – 50 mg/l, 0 – 100 mg/l, 0 – 200 mg/l, 0 – 500 mg/l, 0 – 1,000 mg/l, 0 – 2,000 mg/l, 0 – 5,000 mg/l, 0 – 10,000 mg/l, 0 – 20,000 mg/l	0 – 2,000 µg/l 0 – 5,000 µg/l 0 – 10,000 µg/l 0 – 25,000 µg/l 0 – 50,000 µg/l –	0 – 5 mg/l, 0 – 10 mg/l, 0 – 25 mg/l, 0 – 50 mg/l, 0 – 100 mg/l, 0 – 200 mg/l, 0 – 500 mg/l, 0 – 1,000 mg/l, 0 – 2,000 mg/l, 0 – 5,000 mg/l, 0 – 10,000 mg/l, 0 – 20,000 mg/l
Response time	T90 approx. 8 min, depending on measuring range	T90 ≤ 5 min T20 ≤ 3 min	T90 approx. 8 min, depending on measuring range
Minimum detection limit	0.015 mg/l	5 µg/l	0.1 mg/l
Application	Industrial process water and wastewater	Monitoring steam/condensation, cooling water and feed water, US Pharmacopoeia applications	Industrial process water and wastewater
Accessories	Carrier gas purification, sample filtration	Carrier gas purification, sample filtration	Carrier gas purification, sample filtration

→ For order information about the ASTROTOC process photometers, reagents and wear parts, see www.hach-lange.co.uk, www.hach-lange.com

Continuous TOC measurement—ideal for municipal wastewater: TOCTAX

WW

DW

PW

- Integrated digestion
- High level of uptime
- Precise measured values due to representative and homogenised sample
- Self-cleaning
- Low maintenance



SIGMATAX 2
Sample preparation



TOCTAX process photometer—all
reagents easily accessible

Chemical digestion and low-maintenance operation

The TOCTAX process photometer determines the TOC of water and wastewater using the expulsion method—including solid particles sized up to 0.5 mm. The chemical digestion is carried out by a patented method, then an infrared detector measures the CO₂ concentration in the gas phase.

Continuous monitoring

Continuous TOC (total organic carbon) measurement provides timely warning of an imminent increase in concentration above the limiting value in a sewage treatment plant outflow or in cooling water. TOCTAX functions in conformity with the EN 1484 standard and complies with regulatory requirements concerning the TOC monitoring value.

A great combination: TOCTAX and SIGMATAX 2

SIGMATAX 2 homogenises the original sample (including solid particles up to 0.5 mm in size). The representative sample is delivered to the TOCTAX, ensuring reliable determination of the TOC with minimal maintenance.

Technical data for TOCTAX process photometer

Model No.	LPV375
Measurement method	Wet-chemical digestion with sodium peroxodisulphate, in conformity with the EN1484 standard (expulsion method), CO ₂ analysis with infrared detector
Measuring range	1–100 mg/l TOC
Measurement interval	Approx. 16 min
Reagent supply	Sufficient for 2 months
Carrier gas purification	Integrated

Annual requirement for TOCTAX photometer

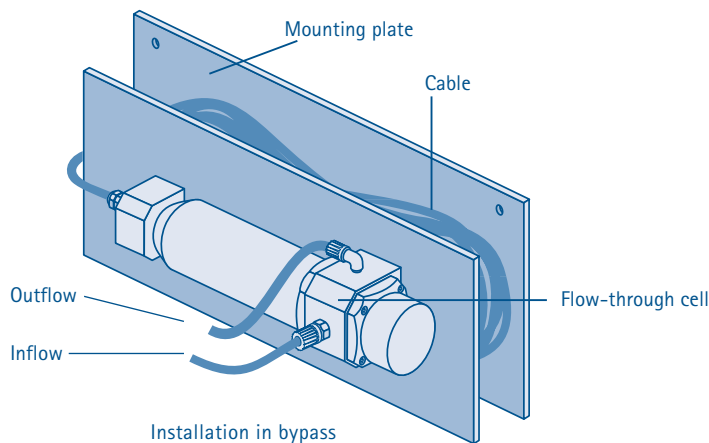
LCW840	6 x reagent
LCW841	6 x absorbance solution
LCW842	2 x standard solution, 25 mg/l
LZV313	1 x annual wear kit

- For more information about the SIGMATAX 2 sampler: see page 134
- Reagents and spare-parts kits for the TOCTAX process photometer: www.hach-lange.co.uk, www.hach-lange.com

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Continuous measurement of organic load: UVAS plus sc

- No sampling or sample conditioning
- Fast results
- No reagents
- Self-cleaning probe
- Immersion or bypass probe



UVAS plus sc probe—for sum parameters such as COD or TOC

Reagent-free measurement of organic load

The UVAS plus sc process probe measures the spectral absorption coefficient of a fluid at 254 nm. The SAC254 is a measure of the organic content of the fluid. The probe is simply submerged in the fluid, without taking samples. No reagents have to be added and the measured values are immediately available.

SAC254—with a wide application spectrum

The SAC254 is ideal for analysing water, wastewater, surface water and solids-free landfill leachate, and correlates with the COD or TOC of the sample. The UVAS plus sc can be used with all fluids that contain organic compounds and absorb UV light.

Fast results, simple handling, low costs

The UVAS plus sc probe is mounted in the fluid and provides results within seconds. Handling and maintenance are very simple, thanks to an automatic cleaning system. The reagent-free measurement method gives reliable measured values, ensuring low operating costs.

Technical data for UVAS plus sc probe

Measurement procedure	UV absorption measurement (2-beam method)
Measurement method	SAC254 conforms to with DIN 38404 C3
Measuring ranges (path length, Article no.)	0.01–60 m ⁻¹ (50 mm, LXV418.99.90001) 0.1–600 m ⁻¹ (5 mm, LXV418.99.50001) 0–1,500 m ⁻¹ (2 mm, LXV418.99.20001) 2–3,000 mV ⁻¹ (1 mm, LXV418.99.10001)
Response time	≥ 1 min
Maintenance	1 h/month when in normal use

→ Mounting kits for UVAS plus sc probe: see page 144



SC 100 Controller:
Up to two probes can be connected

→ For more information see page 97



SC 1000 Controller:
Up to eight probes can be connected

→ For more information see page 98

Intelligent sensors for active, free chlorine, ClO_2 and O_3

- **Stable measurements thanks to flow-through cell**
- **Easily installed premounted flow-through system**
- **Special accessories for optimal operation**
- **Minimal maintenance thanks to automatic cleaning**
- **Plug + play with SC controllers**

Simple installation and operation

The amperometric sensors are supplied premounted on a console. They only need to be fitted at the required location and connected to the analyser or the controller. The measurements are carried out reagent-free, thus saving operating costs. The membranes are also pre-mounted on caps and can be exchanged very easily. Wear parts for two years are included with the system.

Accessories for optimised operation

A variety of accessories are available for all amperometric sensors, e.g. the freely programmable acidification unit, which is used to adjust the pH of samples with a pH greater than 8 and for cleaning.



Amperometric system, e.g. for total free chlorine with pH compensation at SC 100 Controller



SC 100 Controller:

→ For more information see page 97

Additional SC drinking water sensors, e.g. pH, conductivity, LDO, nitrate.



SC 1000 Controller:

→ For more information see page 98

A maximum of eight SC probes can be connected.



CL17 chlorine analyser

Photometric measurement of free or total chlorine

The CL17 chlorine analyser uses the DPD method to determine the concentration of free or total chlorine in acidic or alkaline water samples. A reference measurement without reagents compensates for the intrinsic colour and turbidity of the sample, thus guaranteeing safe and reliable results. The CL17 process photometer also benefits from low reagent consumption and low maintenance costs.

Technical data of the amperometric sensors and CL17 analyser

PARAMETER	9184 sc – FREE CHLORINE ACTIVE/TOTAL	9185 sc – OZONE	9187 sc – CHLORINE DIOXIDE	CL17 – FREE CHLORINE/ TOTAL CHLORINE
Measurement technique		Amperometric		Photometric, DPD method
Measuring range	0.005–20 mg/l as HOCl	0.005–2.0 mg/l as O ₃	0.01–2.0 mg/l as ClO ₂	0.03–5.0 mg/l free chlorine total chlorine
Accuracy (higher value)	2% or ± 10 ppb HOCl	3% or ± 10 ppb O ₃	5% or ± 10 ppb ClO ₂	5% or ± 5 ppb Cl ₂
Measurement interval	Continuous			2.5 min
Minimum flow rate	14 l/h (200–250 ml/min)			
Sample temperature	2–45 °C			5–40 °C
Temperature compensation	Automatic across the total temperature range			
Sample pH	pH 4–8 (acidification unit for pH > 8), including pH electrode	–	–	–
Materials	Electrode: gold cathode, silver anode; Measuring cell: Acryl; Probe body: PVC			Measurement cell: Glass
Controller	SC 100/SC 1000 see page 96			Integrated
Dimensions (H x W x D)	229 x 250 mm			419 x 343 x 191 mm

Ordering information

DESCRIPTION	ART. NO.
9184 sc sensor for free active chlorine HOCl, without SC Controller	LXV430.99.00001
9184 sc sensor for total free chlorine TFC, including pH electrode, without SC Controller	LXV432.99.00001
9185 sc ozone sensor, without SC Controller	LXV433.99.00001
9187 sc chlorine dioxide sensor, without SC Controller	LXV434.99.00001
OPTIONAL ACCESSORIES	
Digital extension cable, 1 m (also available in other lengths)	61224–00
9180 sc discontinuous sample feed	LZY052
9180 sc acidification unit	LZY051
SPARE PARTS	
pH electrode	Z368416,00000
9184 sc electrode	Z09184=A=1001
Premounted membranes, 4/pkg	Z09184=A=3500
Electrolyte	Z09184=A=3600
9185 sc electrode	Z09185=A=1000
Premounted membranes, 4/pkg	Z09185=A=3500
Electrolyte	Z09185=A=3600
9187 sc electrode	Z09187=A=1001
Premounted membranes, 4/pkg	Z09187=A=3500
Electrolyte	Z09187=A=3600



More information at www.hach-lange.co.uk, www.hach-lange.com, keyword "9184 sc", "9185 sc" or "9187 sc", with free downloads of brochure (DOC063.52.00441) and User Manual (DOC023.52.00051)

ISE, pH or redox titration: 8810 analyser

The 8810 analyser is designed for process control systems based on pH, redox titration or ion-selective electrodes. Its rugged design makes it especially suitable for industrial applications. The 8810 analyser automatically processes the samples in their original condition, without filtration. As a modular platform, it has a wide range of uses.

Continuous analysis with ion-selective electrodes

The concentration of many ions can be measured very effectively with the help of ion-selective electrodes. A number of automatic calibration methods are available, including single or double standard additions.

Automated titration

Titrimetric analysis methods can be used to analyse substances for which no direct measurement sensors are available. The 8810 analyser can be used to automate laboratory titration procedures. Identical methods and reagents are used, so that the results are comparable with laboratory data.



Analysis unit of the 8810 analyser, with automatic electrode cleaning

Variants of the 8810 analyser: applications and measuring ranges*

PARAMETER	MEASURING RANGE	UNIT	APPLICATION
Ammonium	0.01–1–100	mg/l $\text{NH}_4\text{-N}$	Drinking water/surface water
Chloride	0.5–500	mg/l Cl^-	Industrial wastewater/ cooling water/surface water
Fluoride	0.1–1,000	mg/l F^-	Semiconductor and industrial wastewater/drinking water
Free alkalinity (p value)	1–500	mg/l CaCO_3	Decarbonation/ water treatment
Free and total alkalinity (p + m values)	1–500	mg/l CaCO_3	Decarbonation/ water treatment
Total alkalinity (m value)	1–500	mg/l CaCO_3	Decarbonation/ water treatment/cooling water
Free and total acid	0.05–2 0.5–25	Points F/S Points G/S	Phosphating baths
Total hardness	1–10–500	mg/l CaCO_3	Boiler water/softening/ water treatment
Sodium hydroxide	0.02–0.5–5 0.4–10–50	g/l NaOH g/l	Degreasing baths
Hydrogen peroxide	0.01–0.2 0.1–2.0 0.2–5.0 1–20	g/l H_2O_2 g/l g/l g/l	Textile industry/semiconductors

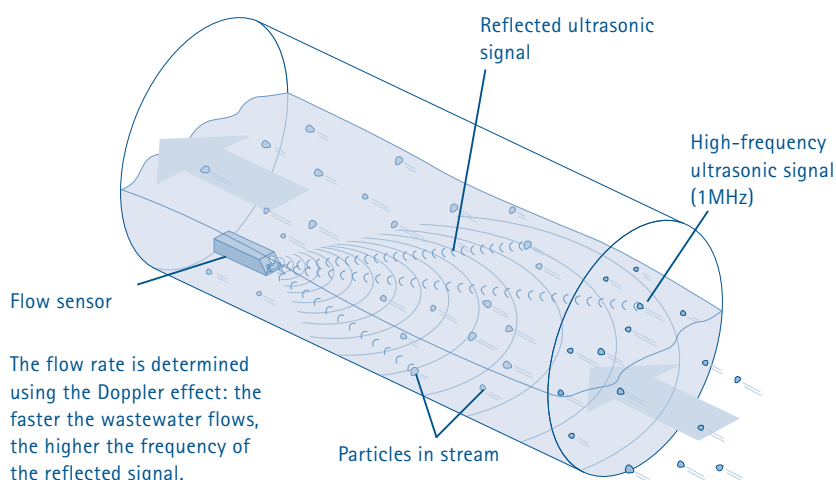
Technical data for 8810 analyser

Mounting: wall-mount unit, free-standing cabinet or control panel
Modular design, for pH or redox titrations, ion-selective measurements
User-specific menu programming
Programmable concentration units and titration sequence
Programmable or self-seeking end point
Integrated error diagnostics
Automatic temperature compensation
Automatic electrode cleaning
Automatic calibration (optional)
Automatic switching to maximum of six sample streams (optional)

* Additional parameters on request: chlorine, cyanide, sodium, indigo, sulphide

Flow measurements in partially filled pipes

Flow measurements are essential to smooth and efficient process control in many municipal and industrial applications. All models of the SIGMA family determine the flow rate in open channels by means of the Doppler method. Thanks to a high frequency signal (1 MHz), the resolution of the measured values is excellent.



Extensive range of applications

- Construction and optimisation of dewatering plants
- Inflow and outflow measurement in sewage treatment plants
- Infiltration water determination
- Discharger monitoring
- Overflow determination, e. g. in storm-water overflow tanks

FEATURES	SIGMA 911	SIGMA 950	SIGMA 950 AV	SIGMA 950 OPTIFLOW	SIGMA 950 OPTIFLOW/AV
Portable	●	●	●	●	●
Permanent installation		●	●	●	●
Keypad and liquid crystal display (LCD)		●	●	●	●
Battery capacity in days (15 min interval)	240	150	150	150	150
Alternating current option		●	●	●	●
Data export with INSIGHT Software	●	●	●	●	●
Connections for					
1 water level		●		●	
1 water level and/or flow rate	●		●		●
Sampler activation		●	●	●	●
Water level measurement with					
Bubbler		●*	●*	●**	●**
Pressure sensor	●	●*	●*	●**	●**
Ultrasonic sensor		●*	●*	●**	●**
AV in combination with flow rate	●		●*		●**
ATEX-compliant explosion protection	●				
Optional features					
pH/Temp.		●	●	●	●
4 to 20 mA output		●	●	●	●
Analogue inputs		●	●	●	●
Alarm function, programmable		●	●	●	●
Installation accessories	Available, depending on meter, up to pipe diameter 2500 mm				

* SIGMA 950/AV has one of the 3 listed water level techniques

** SIGMA 950 OPTIFLOW/AV has all 3 listed water-level techniques, which may only be used one at a time
Accessories and technical data of the SIGMA 8300/8500 flow meters available on request

Flow and level meters for municipal sewage treatment plants

WW

PW

In municipal sewage treatment plants, HACH LANGE provides application-specific solutions and high quality analysis. The familiar flow and level meters from SIEMENS have now been integrated into the HACH LANGE range, having been tested in all wastewater treatment applications. HACH LANGE continues to live up to its claim of offering complete solutions for all aspects of water analysis.



MAGFLO flow metering with modular concept—here the MAG 5100 W sensor and MAG 5000 transducer for water and wastewater applications

MAGFLO—the family of flow meters based on electromagnetic induction

The MAGFLO flow meters can be used to monitor the flow in full pipes. The MAG 5100 W sensor, for example, is ideal for water and wastewater applications:

- Flexible use, with nominal pipe sizes ranging from 25 to 1,200 mm,
- Hard elastomer liner to ensure long-term functionality
- Highly accurate even at low flow rates, due to conical design—ideal for detecting leaks
- Can be buried and permanently flooded
- Electrode material AISI 316 Ti (W1.4571)
- Temperature of measured medium: –5 to 70 °C
- Pressure number PN 10/16

Additional solutions are available for applications where there is an explosion hazard, or with nominal pipe sizes up to 2,000 mm.



SITRANS sensors—level meter with ultrasonic technology

SITRANS LU and SITRANS LR product families—level meters based on ultrasonic and radar sensors

SITRANS LU sensors monitor and control the level of liquids and sludge in wastewater treatment systems, e.g. in pump shafts and open channels. The contact-free ultrasonic technology requires very little maintenance. Depending on the application, the sensors can be complemented by an appropriate transducer, e.g. the HYDRO RANGER 200 for flow monitoring in open channels. SITRANS LR sensors use radar technology. They deliver reliable data even under very demanding conditions, e.g. in digesters or when surfaces are covered by foam. All standard communication protocols are supported.

→ In some countries, SIEMENS solutions are not available from HACH LANGE. Your HACH LANGE contact will provide you with further information.

High quality, precise probes— with integrated mounting kits

- Versatile modular system
- Application-specific design
- Easily integrated with process probes
- Rugged and simple to use



Designed for a wide range of applications

High-quality probes are necessary for precise and reliable results. Such probes must be integrated properly and mounted correctly to enable them to function to their full capability, guaranteeing efficient plant operation with maximum reliability and minimum costs!

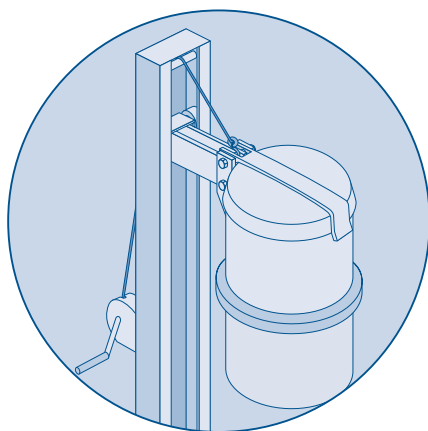
Unbeatable flexibility

Mounting kits from HACH LANGE have versatile uses:

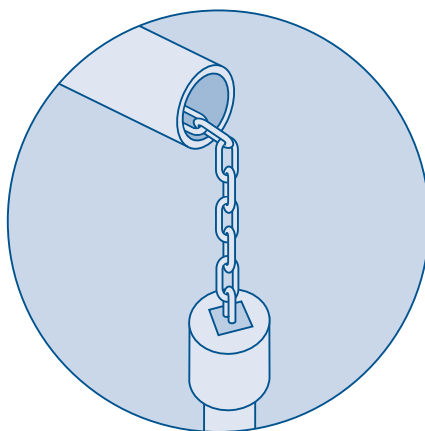
- Can be mounted in tanks, bypasses, pipes or vessels
- Offer reliable mounting devices for everything from a pH probe to a complete analyser
- Can be free standing or permanently fixed
- Uses rugged materials such as steel or plastic

Modular system for the perfect solution

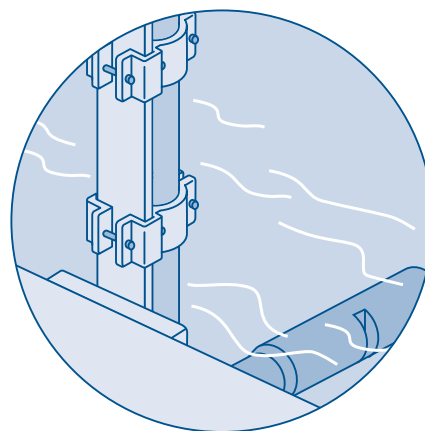
HACH LANGE has designed a modular system for mounting process probes. Standardised and integrated system parts and probes complement each other perfectly. Only extensive measurement systems from a single supplier can reliably guarantee such a high degree of compatibility and versatility over a range of applications.



EVITA sensor, fixed installation on a mounting bracket



Electrochemical sensor, chain-mounted



NITRATAX process probe, fixed installation

→ Laboratory analysis: see Chapter 2-8 → Laboratory automation: see Chapter 9 → Samplers: see Chapter 10

WW

DW

PW

Mounting kits for process sensors—order information

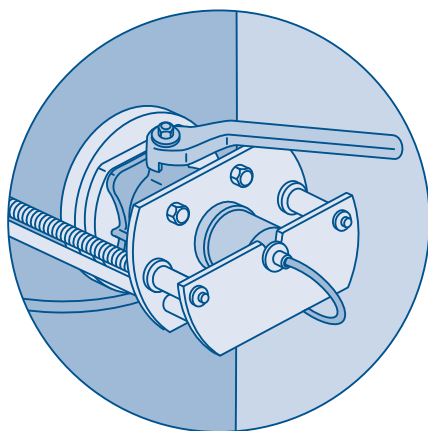
PARAMETER	PRODUCT FAMILY	CATALOGUE PAGE	TANK	RAIL	INLINE	BYPASS
			Fixed installation	Chain		
Oxygen	LDO *	117	LZX914.99.3X100	LZX914.99.1X100	LZX914.99.42100	LZH052
	EVITA OXY	118	On request		191L865X 085G4085	
pH/Redox	5740 sc **	119	LZX914.99.3X200	LZX914.99.1X200		6136300
	pHD **	113	LZX914.99.3X200	LZX914.99.1X200		6136300
	1200S sc	113	LZX914.99.3X200	LZX914.99.1X200		
	Other **	119	On request	On request		On request
Conductivity	3798S sc **	119	LZX914.99.3X200	LZX.99.1X200		6136300
	37XX sc **	119	On request	On request		
	34XX sc **	119			MH1X8M9NZ	MH5X8N3NZ
	Other **	119	On request	On request		On request
Solids, turbidity	SOLITAX sc	106	LZX414.00.10000		On request LZX337.00.X	On request
Sludge level	SONATAX sc***	109	LZX414.00.70000		LZX414.00.73000	
Sludge volume	VOLITAX	110	LZX414.00.00000			
Sample preparation	FILTRAX **	134	LZX414.00.40000			On request
	SIGMATAX	134	LZX414.00.00000			
	Filter probe for SC analyser	123	LZX414.00.50000		LZX414.00.60000	
Nutrients	NITRATAX sc **	128	LZX414.99.10000			LZX86X
	AMTAX sc **	125	LZY286	LZY285		
	PHOSPHAX sc **	133	LZY286	LZY285		
	EVITA INSITU 4100	126, 130	081B500X			
	EVITA INSITU 5100			191L865X 085G4085		
	AMMON eco sc	127	On request	On request		
SAC	UVAS plus sc **	138	LZX414.99.10000			LZX86X
Controller	SC 60/100 **	97	LZX997		On request	
	SC 1000 **	98	LZX957		On request	
	Other	111	On request			

* LDO also for floating and wall mounting *** Swivel mounting for SONATAX sc on request

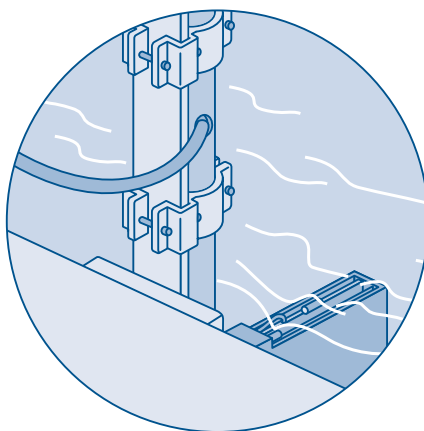
** Also for wall mounting

→ Not all available mounting kits are shown in the table: an X in the model number stands for a number of variants of the mounting kit. More information on request

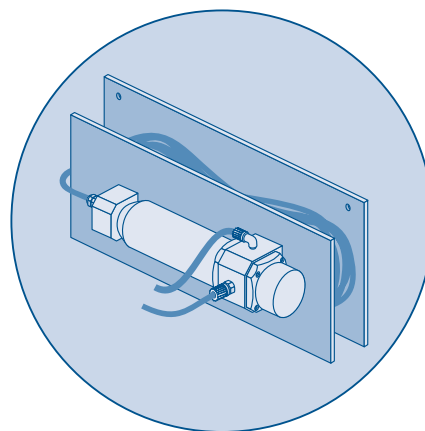
→ All HACH LANGE process sensors listed here are suitable for wall mounting.



SOLITAX solids probe, in-line installation



FILTRAX sample filtration, fixed installation



UVAS plus sc probe, installed in bypass

20

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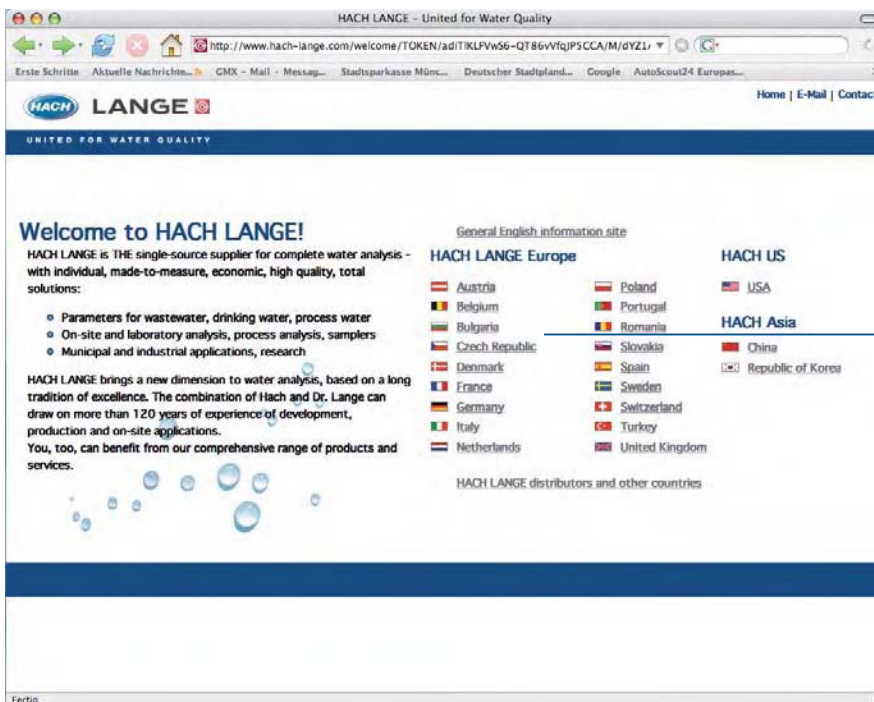
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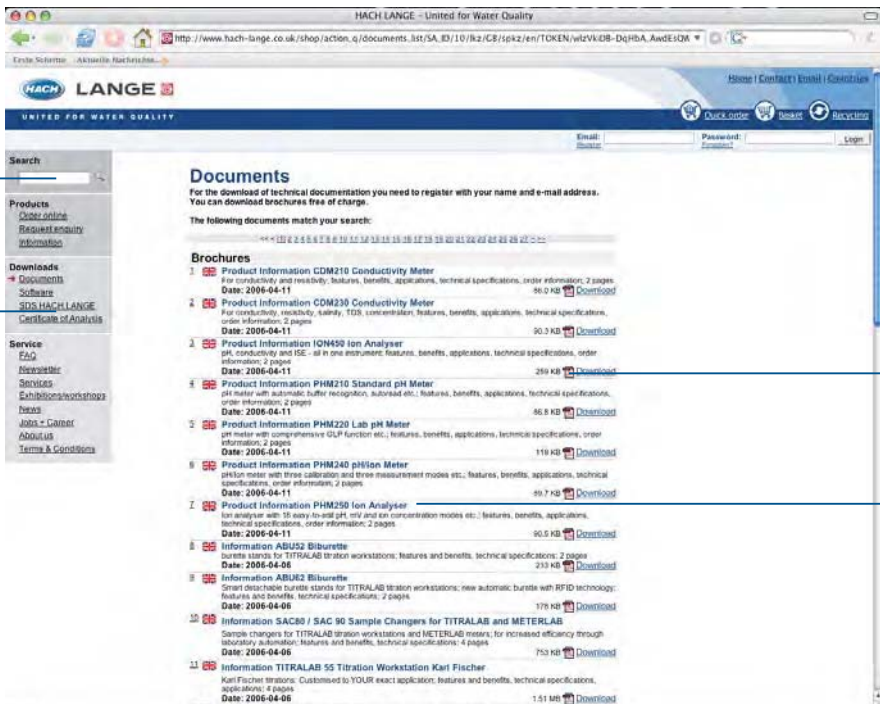


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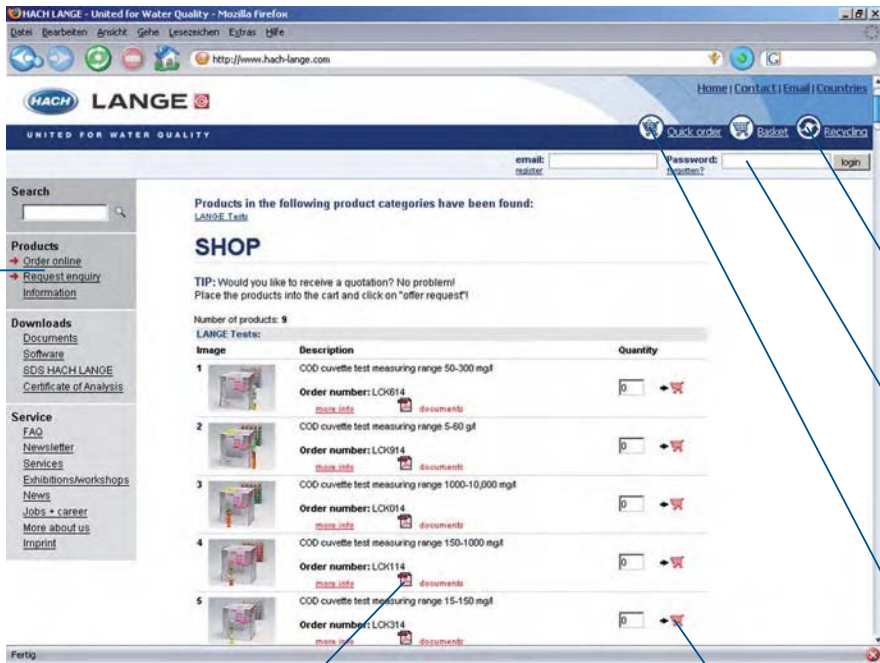
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→ Blue: laboratory analysis

→ Red: process measurement technology

Digital electrochemistry

pH, O₂ (LDO), conductivity ...

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- **User friendly:** Immediately recognisable menus in full text
- **Easy to read:** Large, illuminated graphic display

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- **Fast response:** INTELICAL electrodes are recognised automatically
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- **Intuitive operation:** One-touch measurement available
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