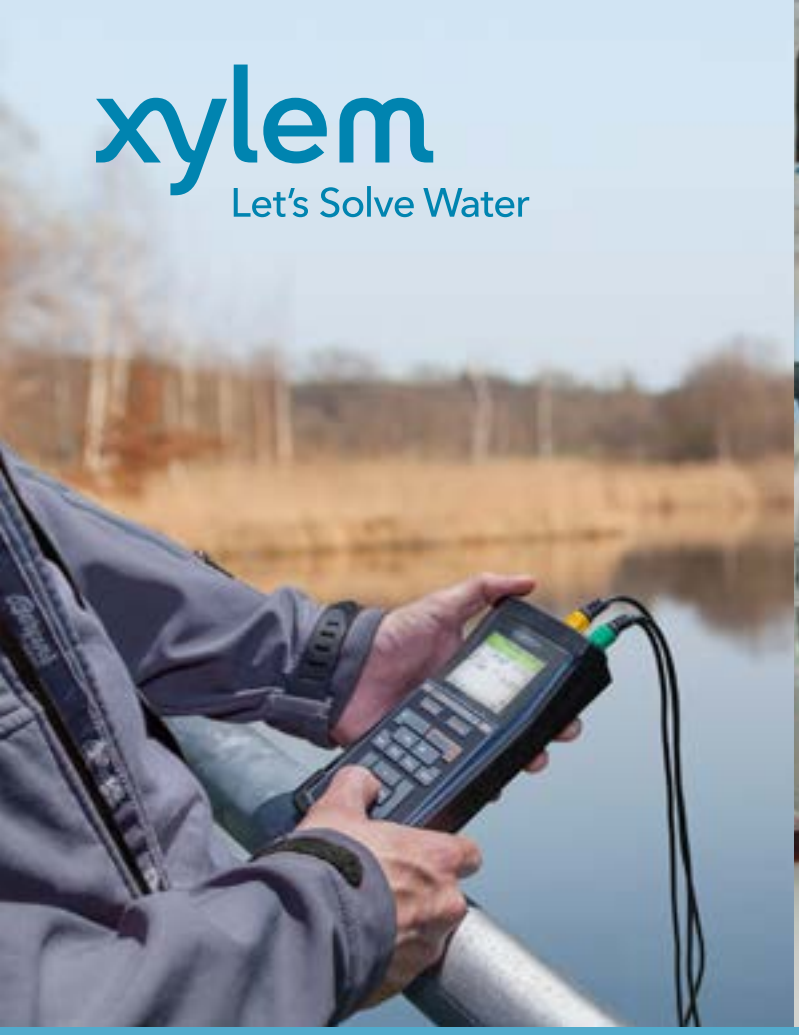
xylem
Let's Solve Water



Lab and Field Instrumentation

pH · ORP · ISE · DISSOLVED OXYGEN · CONDUCTIVITY·
MULTI-PARAMETER · BOD/RESPIRATION · PHOTOMETRY · TURBIDITY

WTW
a xylem brand

pH measurement

Content

WTW a xylem brand

Xylem Analytics Germany Sales GmbH & Co. KG, WTW
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www.WTW.com

Applications and meters overview

The pH value is defined in water and predominantly aqueous solutions and is one of the three most common parameters measured in the laboratory after weighing and temperature measurement. It has great importance for biological, chemical and biochemical processes, as well as for the properties of different products.

✓ yes
● yes

✓ recommended
✓ recommended for some applications
– not recommended

	Digital			Analogue			Digital			Analogue					
	Benchtop pH meters						Portable pH meters								
	inoLab® IDS			inoLab®			MultiLine® IDS			ProfiLine					
	Multi 9630	Multi 9620	Multi 9310	pH/ION 7320	pH 7310	pH 7110	Multi 3630	Multi 3620	Multi 3510	Multi 3320	pH/Cond 3320	pH/ION 3310	pH 3310	pH 3110	pHotoFlex® pH
2 parameters simultaneously	✓	✓		✓			✓	✓		✓	✓				
3 parameters simultaneously	✓						✓								
pH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ORP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ISE (pH/ION function)	●	●		●						●	●	●			
Ion-specific measurement programs	●	●		●											
Additional parameters	●	●	●				●	●	●	●	●				●
Routine measurements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Routine measurements with documentation	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
AQA with documentation	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
R&D High resolution and precision	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Control measurements	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
LIMS connection	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Quality assurance	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Education	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Service	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory measurements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Field measurements	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Depth measurements	–	–	–	–	–	–	✓	✓	✓	–	–	–	–	–	–
PC connection	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
Memory	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
USB interface	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Graphic display			✓	✓	✓				✓	✓	✓	✓	✓		✓
Color graphic display	✓	✓					✓	✓							
Compatible sensor system															
Digital IDS electrodes															
IDS pH electrodes 28	✓	✓	✓				✓	✓	✓						
IDS ORP electrodes 32	✓	✓	✓				✓	✓	✓						
Analogue electrodes															
pH electrodes 65	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special pH electrodes: 67	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ORP electrodes 73	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ion-selective electrodes 81	✓	✓		✓						✓	✓	✓			
	Multi 9630	Multi 9620	Multi 9310	pH/ION 7320	pH 7310	pH 7110	Multi 3630	Multi 3620	Multi 3510	Multi 3320	pH/Cond 3320	pH/ION 3310	pH 3310	pH 3110	pHotoFlex® pH
see page	40	40	41	56	56	57	44	45	46	49	50	32	61	62	145

Benchtop pH meters

The pH measurement benefits from the possibilities of IDS technology like no other measurement. With this, all requirements for Reliable measurements and GLP/AQA compliant documentation can be fulfilled in a simple and efficient manner.

inoLab® IDS – digital

pH measurements with the new digital multi parameter benchtop meters inoLab® IDS:

inoLab® Multi 9630 IDS: Measure three parameters simultaneously

The digital inoLab® multi parameter meter for IDS sensors for simultaneous measurement of the same or different parameters. Up to three sensors can be connected. Also suitable for analogue electrodes with an adapter.

see page 40

inoLab® Multi 9630 IDS

inoLab® Multi 9620 IDS: Measure two parameters simultaneously

Two channel version of the inoLab® Multi 9630 IDS.

see page 40

inoLab® Multi 9620 IDS

inoLab® Multi 9310 IDS: Digital single parameter solution

The new inoLab® Multi 9310 IDS is well suited for pH measurement in the laboratory. The IDS technology allows optimized measurements and efficient documentation in the simplest manner.

see page 41

inoLab® Multi 9310 IDS

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inoLab® – analogue

All benchtop meters are available in application-oriented sets including sensors and accessories.

inoLab
innovations that make sense

3 year warranty | IP 43 | CE

inoLab® pH 7110 SET 4

Technical specifications: inoLab® analogue benchtop pH meters

		inoLab® pH/ION 7320	inoLab® pH 7310	inoLab® pH 7110
Measurement ranges/ dissolution	**pH**	-2.000 ... +20.000 pH	-2.0 … 20.0 ±0.1 pH -2.00 … 20.00 ±0.01 pH -2.000 … 19.999 ±0.005 pH	-2.0 … 20.0 ±0.1 pH -2.00 … 20.00 ±0.01 pH -2.000 … 19.999 ±0.005 pH
	mV	±1200.0 mV ± 2500 mV	±1200.0 mV ± 2500 mV	± 1200.0 mV ± 2000 mV
	Temp.	-5 ... +105 °C/0.1 °C	-5.0 … +105.0 °C ±0.1 °C	-5.0 … +105.0 °C ±0.1 °C
	Conc. (mg/l, µmol/l, mg/kg, ppm, %)	0.000…9.999 10.00…99.99 100.0…999.9 1000…999999		
Accuracy (±1 digit)	**pH**	±0.005 pH ±0.01 pH	±0.005 pH ±0.01 pH	±0.005 pH ±0.01 pH
	mV	±0.3 mV, ±1 mV	±0.3 mV, ±1 mV	±0.3 mV, ±1 mV
	Temp.	±0.1 K	±0.1 K	±0.1 K
Calibration			1-, 2-, 3-, 4-, 5-point, WTW techn. buffer, DIN, NIST, as well as additional 20 buffer sets	1-, 2- or 3-point WTW technical buffers or DIN/NIST
		MultiCal® calibration automatic:		
	AutoCal	2-/3-/4-/5 point		
	AutoCal-Tec	2-/3-/4-/5 point		
	ConCal®	1-/2-/5 point		
	ISECal	2 bis 7 points		
		Special functions: Known addition (single) Known subtraction Sample addition Sample subtraction Known addition with blank value correction		

inoLab® pH/ION 7320 – Reliable ISE measurement and documentation

The inoLab® pH/ION 7320 with two pH/mV/ISE inputs is perfectly suited for precision measurement and automatic GLP/AQA compliant documentation in quality laboratories of all industries. Also available with optional built in printer.

see page 78

inoLab® pH/ION 7320P
(with built-in printer)

inoLab® pH 7310: Reliable pH documentation

inoLab® pH 7310P (with built-in printer)

- **USB interface for fast data transfer**
- **Data output in *.csv-Format or via optionally installed printer**
- **CMC function for measuring range monitoring**

The inoLab® pH 7310 is perfectly suited for precision measurement and automatic GLP/AQA compliant documentation in quality laboratories of all industries. Also available with optionally installed printer.

Reliable measurements

- Repeatable measurement results due to active automatic AutoRead function for the detection of stable measured values
- The CMC function visualizes the optimal measuring range for correct measurement
- Graphic display with clear text menus for convenient and safe operation

GLP/AQA compliant documentation

- Alphanumeric input of the electrode serial number
- Transfer of all data in *.csv format via USB interface at the PC, formatted takeover into Excel (MultiLab® Importer)
- Output possible via optionally installed printer

Flexible and high performance:

- 1- to 5-point calibration with calibration timer for all requirements
- 24 pre-programmed buffer sets for easy calibration
- 1- to 5-point calibration with customer-specific buffers
- Backlit graphics display

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www.WTW.com

inoLab® pH 7110: Accurate pH measurement

inoLab® pH 7110

- **Active AutoRead function**
- **Easy calibration with adjustable calibration timer**
- **Intuitive operation with well laid out keyboard**

The inoLab® pH 7110 is optimally suited for routine measurement in the laboratory, where automatic documentation has no priority. With a smooth, easy to clean surface.

Reliable measurements

- Repeatable measurement results due to active automatic AutoRead function for the detection of stable measuring values
- Secure operation: Automated functions reduce the number of keys
- Increased measuring accuracy through adjustable calibration timer

Easy and reliable:

- 1 to 3 point calibration with calibration timer
- MultiCal® Calibration system
- Automatic temperature compensation
- Large multi-function display for pH value and temperature

Order information: Benchtop pH meters inoLab® analogue

Model	Description	Order no.
inoLab® pH 7310P	Convenient, menu-guided pH/mV benchtop meter (DIN) for measurements/GLP/AQA compliant documentation with built-in thermal printer. Single meter with universal power supply, stand, operating manual, CD-ROM with software, USB cable.	1AA310P
inoLab® pH 7310 SET 4	Convenient, menu-guided pH/mV benchtop meter (DIN) for measurements/GLP/AQA compliant documentation. Meter with universal power supply, stand and operating instructions, pH electrodeSenTix® 81 , buffer 4,7 and 10.01, 3 mol/l KCl, CD-ROM with software, USB cable.	1AA314
inoLab® pH 7110 SET 2	Simple, easy-to-use pH/mV benchtop meter (DIN) for routine measurements. Meter with universal power supply, stand and operating instructions, pH electrode SenTix® 41, buffer 4, 7 and 10.01, 3 mol/l KCl.	1AA112
Further SETs and electrodes in the SET or BNC versions see price list or www.WTW.com		

Portable pH meters

pH value is a parameter, which also plays an important role with on-site measurements. The spectrum ranges from measuring pH in surface water up to the measurement in the process of a chemical plant.

MultiLine® IDS – digital

pH measurements with the new digital MultiLine® multi-parameter measuring instruments:

Multi 3630 IDS: Measure three parameters simultaneously

Three galvanically isolated measurement channels, can be freely combined for the same or different parameters. Simultaneous multi measurement without compromises.

see page 44

MultiLine® Multi 3630 IDS

Multi 3620 IDS: Measure two parameters simultaneously

Two galvanically isolated measurement channels, can be used simultaneously for identical or different parameters. Economic multi-parameter meter for many applications in which two parameters must be measured and/or stored simultaneously.

see page 45

MultiLine® Multi 3620 IDS

MultiLine® Multi 3510 IDS: Digital single parameter solution

The single-channel multi-parameter instrument Multi 3510 IDS is ideal for portable pH measurement in all conditions both outdoors and in a plant. Like all MultiLine® IDS meters, it is also suitable for pH measurement with cable lengths of up to 100 m.

see page 46

MultiLine® Multi 3510 IDS

pHotoFlex® Series

A successful combination of photometer and optional turbidity measurement in conjunction with a built-in pH / mV meter.

see "pHotoFlex® pH – Portable photometer with pH measurement function" on page 145

pHotoFlex® pH

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www.WTW.com

ProfiLine – analogue

All portable meters are available including sensors and accessories in a practical field case.

3 year warranty IP 67 CE

ProfiLine pH 3310 SET 2

Technical specifications: Profiline portable analogue pH meters

ProfiLine		Multi 3320	pH/Cond 3320	pH/ION 3310	pH 3310	pH 3110
Measurement ranges/ resolution	**pH**	–2.0…20.0 –2.00…20.00 –2.000…19.999	–2.0…20.0 –2.00…20.00 –2.000…19.999	–2.0…20.0 –2.00…20.00 –2.000…19.999	–2.0…20.0 –2.00…20.00 –2.000…19.999	–2.0…20.0 –2.00…20.00 –2.000…19.999
	mV	±1200.0 ±2500	±1200.0 ±2500	±1200.0 ±2500	±1200.0 ±2500	±1200.0 ±2000
	Temp.	-5.0 … +105.0 °C	-5.0 … +105.0 °C	-5.0 … +105.0 °C	-5.0 … +105.0 °C	-5.0 … +105.0 °C
	Conc. (mg/l, µmol/l, mg/kg, ppm, %)	0.000…9.999 10.00…99.99 100.0…999.9 1000…999999	0.000…9.999 10.00…99.99 100.0…999.9 1000…999999	0.000…9.999 10.00…99.99 100.0…999.9 1000…999999	–	–
Accuracy (±1 digit)	**pH**	±0.1 pH ±0.01 pH ±0.005 pH	±0.1 pH ±0.01 pH ±0.005 pH	±0.1 pH ±0.01 pH ±0.005 pH	±0.1 pH ±0.01 pH ±0.005 pH	±0.1 pH ±0.01 pH ±0.005 pH
	mV	±0.3 mV ±1 mV	±0.3 mV ±1 mV	±0.3 mV ±1 mV	±0.3 mV ±1 mV	±0.3 mV ±1 mV
	Temp.	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C
Calibration		1-, 2-, 3-, 4-, 5-point, WTW techn., DIN, NIST as well as additional 22 buffer sets, 1- to 5-point ConCal® calibration with arbitrary buffers				1-, 2-, 3-point, WTW techn. and DIN buffers
	ISE	2-7 points	2-7 points	2-7 points	–	–
CMC		Yes	Yes	Yes	Yes	–
Data memory		Manual 200/5000 automatic	Manual 200/5000 automatic	Manual 200/5000 automatic	Manual 200/5000 automatic	–
Logger		Manually/time-controlled	Manually/time-controlled	Manually/time-controlled	Manually/time-controlled	–
Display		LCD graphics, backlit	LCD graphics, backlit	LCD graphics, backlit	LCD graphics, backlit	7-Segment LCD
Permanent operation		Up to 800 h without/ 100 h with illumination	Up to 800 h without/ 100 h with illumination	Up to 800 h without/ 100 h with illumination	Up to 800 h without/ 100 h with illumination	Up to 2500 h

ProfiLine Multi 3320: The environment specialist

The Multi 3320 for the measurement of pH, ISE, ORP, conductivity and dissolved oxygen (electrochemical) is an ideal meter for environmental applications in the area of ground and surface water measurement, aquaculture, as well as in a wastewater treatment plant and much more.

see page 49

ProfiLine Multi 3320

ProfiLine pH/Cond 3320: Perfect in process

The pH / Cond 3320 with two inputs for pH, mV, ISE and conductivity measurement is an all-rounder for almost all applications in process chemistry from life science, food and beverage to the pharmaceutical industry (measurement of pH and conductivity according to pharmacopoeia).

see page 50

ProfiLine pH/Cond 3320

ProfiLine pH/ION 3310: pH-, mV- and concentration measurement in one hand

pH/ISE portable meter for pH, mV and concentration measurement - suitable for all areas where accuracy and high-quality results are important.

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ProfiLine pH/ION 3310

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www.WTW.com

ProfiLine pH 3310: Reliable pH documentation

ProfiLine pH 3310

- **Waterproof USB interface for fast data transfer**
- **Data output in *.csv-Format**
- **Data logger for up to 5000 data sets**

The pH 3310 is an elegant combination of a robust portable meter and data logger for anyone who wants to automatically save measurement series and process them further on the PC.

Reliable measurements

- Repatable measurement results due to active automatic AutoRead function
- The CMC function visualises the optimal measuring range and supports correct measuring
- Graphic display with plain text menus for convenient and safe operation

GLP/AQA compliant documentation

- Transmission of all data in *.csv format via USB interface at the PC
- Formatted takeover into Excel (MultiLab® Importer included in the delivery or as a download)

Flexible and high performance:

- 1- to 5-point calibration with calibration timer for all measuring tasks
- 24 pre-programmed buffer sets for easy calibration
- Backlit graphic display with CMC display

ProfiLine pH 3110: Easy pH measurement

ProfiLine pH 3110

- **pH or ORP measurement**
- **Simple 1 to 3 point calibration with adjustable calibration timer**
- **Robust and waterproof (IP 67)**

The pH 3110 is ideal for anyone looking for a simple, robust and waterproofmeter for portable pH measurement.

Reliable measurements

- Repeatable measurement results due to active automatic AutoRead function for the detection of stable measured values
- For the safe operation automated functions and simplified keyboard
- A waterproof DIN socket enables for measurement also in a humid environment

Easy and reliable:

- Easily readable display for measured value and temperature
- Silicon keyboard with tactile key click, operable with gloves
- For field use in a carrying case set with proven electrodes

Order information: ProfiLine portable measuring pH meters

Model	Description	Order no.
ProfiLine pH 3310 SET 2	Robust and waterproof portable pH meter with data logger and USB Mini-B interface, for battery operation, in a carrying case kit with SenTix® 41	2AA312
ProfiLine pH 3110 SET 2	Robust and waterproof portable pH meter for battery operation, in a carrying case kit with SenTix® 41	2AA112
Further electrodes in SET see price list or www.WTW.com		

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www.WTW.com

pH electrodes

IDS electrodes - digital

Digital measurement of pH with integrated electrode quality monitoring - can be used in all areas of laboratory and field measurement also for special applications.
Also as fixed cable variants and wireless ready.

see "IDS pH electrodes" on page 28

from left to right: the digital IDS sensors (1) SenTix® 940, (2) SenTix® 945, (3) SenTix® 950, (4) SenTix® 980; the IDS special electrodes (5) SenTix® HW-T 900, (6) SenTix® Sp-T 900, (7) SenTix® Micro 900; the wireless ready IDS plug head electrodes (8) SenTix® 940-P, (9) SenTix® 945-P, (10) SenTix® 950-P, (11) SenTix® Sp-T 900-P, (12) SenTix® 980-P, (13) SenTix® HW-T 900-P, (14) SenTix® Micro 900-P and (15) SensoLyt® 900-P

Applications for SenTix® electrodes

Our pH electrodes are optimised for measurement in aqueous systems. In addition, there is the possibility to also measure samples of a different consistence. The following table provides information about other application fields and electrodes suitable therefor.

● recommended by WTW
❍ can be used for this application
* only recommended for the mentioned model

	SenTix® ...											
	20 21-..., 22	41, 41-3, 42, RJD, 940, 940-P	51, 52, 950, 950-P	60, 61 62	81, 82, 980, 980-P, 945, 945-P	91	H	HW, HWD, HW-T 900, HW-T 900-P	Sp, Sp-DIN, Sp-T 900, Sp-T 900-P	Sur	Mic, MIC-D, MIC-B, Micro 900, Micro 900-P	ORP**, ORP-T 900**, ORP-T 900-P**, PtR, Ag, Au
Aquarium water	●	●	●	❍	❍	❍						ORP...*, PtR*
Beer			●	●	●			●				ORP...*
Beverages				●	●	●		❍				
Bleaching lye			❍	❍	❍	❍	●	❍				
Boiler feed water				❍	❍	❍		●				
Bread									●			
Cheese (punch possibly necessary)									●			
Coffee extract			❍	●	●	●		●				
Condensate								●				
Cosmetics								●	●	●		
Diluted acids				●	●	●		❍				Au, ORP...*
Diluted alkalis							●					
Dispersion colors		RJD*						●				
Distilled water								●				
Drinking water	❍	❍	●	●	●	●		❍				
Electroplating waster water	●	●	❍	❍	❍	❍		❍				❍
Fruit									●			
Fruit juice			●	●	●	●		❍				
Fruit juice			●	●	●	●		❍				
Fully demineralised water								●				
Galvanic baths		RJD*	●	●	●	●		❍				●
Groundwater	●	●	❍	❍	❍							PtR*
H_2S-containing liquids		RJD*						●				PtR*
Household cleaners	❍	❍	❍	●	●	●	●	❍				
Leather										●		
Lemonade			●	●	●	●		❍				
Measurement in Eppendorf or NMR vessels											●	
Meat (punch possibly necessary)									●			
Milk				●	●	●		●				
Mineral water	❍	❍	●	●	●	●		❍				
Oil/water emulsions		RJD*						●				
Paints and coatings, water soluble		RJD*						●				
Paper										●		
Paper extract				●	●	●						
Protein-containing liquids				●	●	●		●			MIC-D/-B* Micro 900*	
Rain water				❍	❍	❍		●				
saline solutions	❍	❍	❍	●	●	●	❍	●				ORP...*
saliva										●	❍	
Sausage (punch possibly necessary)									●			
Seawater				❍	❍	❍	❍	●				
Shampoo								●				
Skin										●		
Soil extract				●	●	●		●				
Solids (insertion)									●			
Solids (surface)										●		
Surface water	●	●	●	●	●	●		❍				
Suspensions		RJD*						●				ORP...*
Swimming pool water	●	●	●	❍	❍	❍						
Tris buffer solutions				●	●	●		●				
Vegetable juice			❍	●	●	●		❍				
Vegetables									●			
Waste water	●	●	❍	❍	❍	❍						PtR*
Wine			❍	●	●	●		●				
Yoghurt				●	●	●		●	●			
	20 21-..., 22	41, 41-3, 42, RJD, 940, 940-P	51, 52, 950, 950-P	60, 61 62	81, 82, 980, 980-P, 945, 945-P	91	H	HW, HWD, HW-T 900, HW-T 900-P	Sp, Sp-DIN, Sp-T 900, Sp-T 900-P	Sur	Mic, MIC-D, MIC-B, Micro 900, Micro 900-P	ORP**, ORP-T 900**, ORP-T 900-P**, PtR, Ag, Au

1 year warranty for material damages for all pH sensors as per § 10 Terms and Conditions
*** for ORP measurement*

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SenTix® pH electrodes analogue

WTW SenTix® quality electrodes – measurement convenience and precision in one.

- Low-resistance membrane glasses warranty stable measurement signals even at low temperatures
- Silver ion-free reference electrolyte together with the proven platinum wire junction prevents measurement problems due to precipitating silver compounds
- Functional slider for opening and safe closing of the refill opening with electrodes with liquid electrolyte.
- Connection possibilities: waterproof DIN plug, BNC plug, fixed cable (1 or 3 m) or plug head (S7)

Technical specifications: SenTix® pH electrodes analogue

Models	pH electrodes with gel electrolyte							pH electrodes with liquid electrolyte							
SenTix® ...	20	21	21-3	22	41	41-3	42	51	52	60	61	62	81	82	91
Measurement Range pH	0 ...14 pH				0 ...14 pH			0 ...14 pH		0 ...14 pH			0 ...14 pH		0 ...14 pH
Application area temp.	0 … 80 °C				0 … 80 °C			0 … 80 °C		0 ...100 °C			0 ...100 °C		0 ...100 °C
Reference electrolyte	Gel							KCl 3 mol/l, Ag^+-free							
Membrane shape	Cylinder				Cylinder			Cylinder		Cone			Cone		sphere
Membrane resistance	<1 GΩ				<1 GΩ			<1 GΩ		<600 MΩ			<600 MΩ		<600 MΩ
Diaphragm	Fibre				Fibre			Ceramics		Platinum			Platinum		Platinum
Shaft material	Plastic				Plastic			Plastic		Glass			Glass		Glass
Shaft length (±2 mm)	120 mm				120 mm			120 mm		120 mm			120 mm		170 mm
Shaft-Ø (±0.5 mm)	12 mm				12 mm			12 mm		12 mm			12 mm		12 mm
Temperature sensor	–				integr. NTC (30 KΩ)			integr. NTC (30 KΩ)		–			integr. NTC (30 KΩ)		integr. NTC (30 KΩ)
Connection	①	②	②	②	②	②	②	②	②	①	②	②	②	②	②
Electrode cable	③*	④	⑤	④	④	⑤	④	④	④	③*	④	④	④	④	④
Electrode plug	⑥/⑦	⑥	⑥	⑦	⑥+⑧	⑥+⑧	⑦+⑧	⑥+⑧	⑦+⑧	⑥/⑦	⑥	⑦	⑥+⑧	⑦+⑧	⑥+⑧

Models	pH electrodes for special applications									
SenTix® ...	H	HW	HWD	SP	SP-DIN	Sur	Mic	Mic-D	Mic-B	RJD
Measurement Range pH	0 … 14 pH	0 … 14 pH	0 … 14 pH	2 … 13 pH		2 … 13 pH	0 … 14 pH	0 … 14 pH		2 … 13 pH
Application area temp.	0 ... 80 °C	0 ... 60 °C	-5 ... 100 °C	0 ... 80 °C		0 ...50 °C	0 ... 100 °C	-5 ... 100 °C		0 ... 80 °C
Reference electrolyte	KCl 3 mol/l, Ag^+-free			Polymer			KCl 3 mol/l, Ag^+-free			Polymer
Membrane shape	Cylinder	Cylinder	Sphere	Spear		Flat	Cylinder	Cylinder		Calotte
Membrane resistance	< 2 GΩ	< 800 MΩ	< 600 MΩ	< 400 MΩ		< 1 GΩ	< 700 MΩ	< 1 GΩ		< 600 MΩ
Diaphragm	Split ring	Split ring	Split ring	Hole		Split ring	Ceramics	Platinum		Split ring
Shaft material	Glass	Glass	Glass			Glass	Glass	Glass		Glass
Shaft length (±2 mm)	170 mm	170 mm	170 mm	65/25 mm		120 mm	40/80 mm	96 mm **		120 mm
Shaft-Ø (±0.5 mm)	12 mm	12 mm	12 mm	15/5 mm		12 mm	12/5 mm	3 mm		12 mm
Temperature sensor	–	–	integr. NTC (30 KΩ)	–		–	–	–		integr. NTC (30 KΩ)
Connection	①	①	②	①	②	①	①	②	②	②
Electrode cable	③*	③*	④	③*	④	③*	③*	④	④	④
Electrode plug	⑥/⑦	⑥/⑦	⑥+⑧	⑥/⑦	⑥	⑥/⑦	⑥/⑦	⑥	⑦	⑥+⑧

* not contained in the scope of delivery
** from grinding upper edge

①: Plug head, ②: Fixed cable,
③: AS/DIN, AS/DIN-3 or AS/BNC, ④: Cable length 1 m, ⑤: Cable length 3 m,
⑥: DIN plug, ⑦: BNC plug, ⑧: Banana plug

Low maintenance analogue pH electrodes with gel electrolyte

Ideal for portable measurement but also for routine measurement in the laboratory. With or without built-in temperature sensor All electrodes have robust plastic shafts and a low-maintenance gel reference system.

SenTix® 20

SenTix® 21

SenTix® 41

Quick and precise analogue pH electrodes with liquid electrolyte

For demanding measurements in the laboratory: SenTix® Electrodes with liquid electrolyte, easy to clean glass shaft and platinum diaphragm. Can also be used in difficult samples. And who needs an electrode with liquid electrolyte for portable measurement: The SenTix® 51/52 with plastic shaft, integrated temperature sensor and ceramic diaphragm masters nearly every measuring task.

SenTix® 52

SenTix® 60

SenTix® 61

SenTix® 81

SenTix® 91

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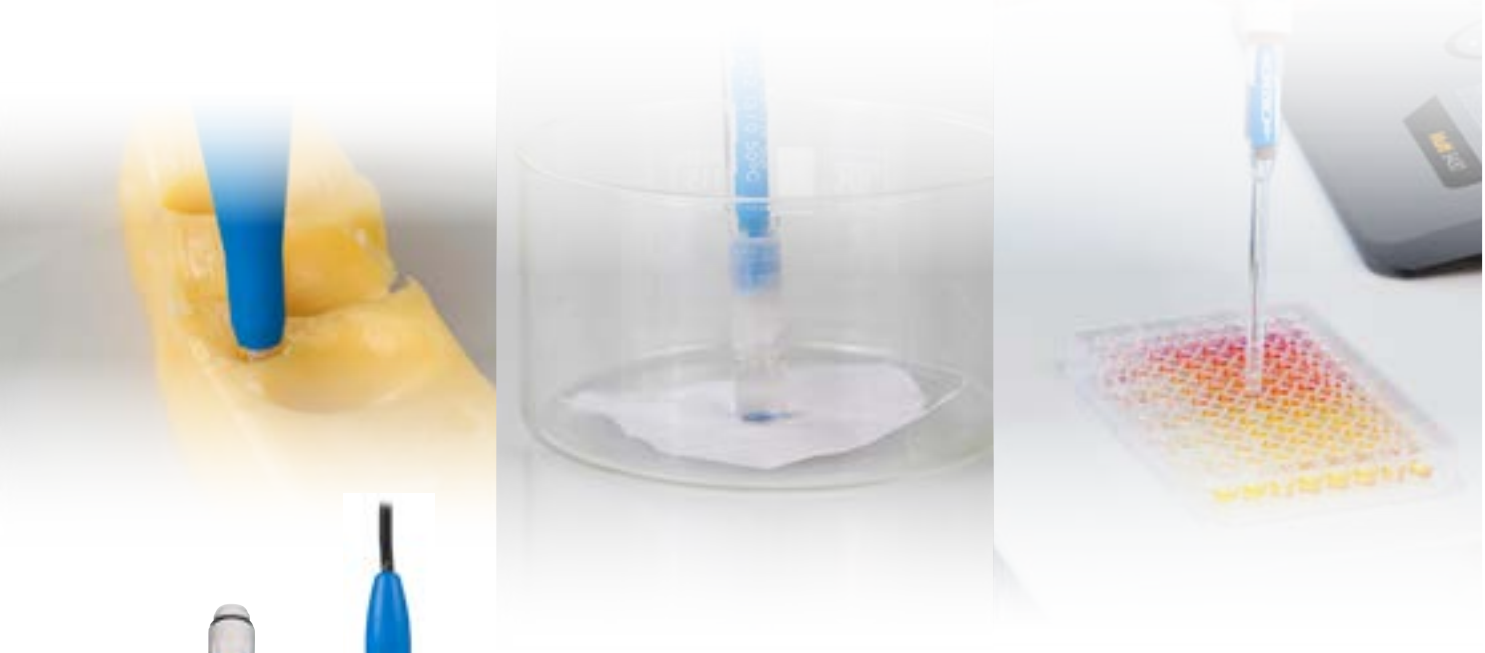
Analogue pH electrodes for special applications: Specialists for all cases

The consistencies of samples in which pH is measured are very different. Liquid or solid, low in ions or highly concentrated, aqueous and non-aqueous phases, with and without suspended solids. Sometimes the smallest volumes have to be determined. All this can be handled easily together with our specialists.

For measurements in or on solids, spear-type and surface electrodes are recommended. pH value measurements in ion-poor or concentrated solutions can be mastered with ground electrodes, as well as in emulsions. Samples with suspended solids can most easily be measured with polymer electrodes. Micro-electrodes help when there is little volume available.



SenTix® HW | SenTix® HWD | SenTix® SP | SenTix® Sur | SenTix® Mic | SenTix® Mic-D | SenTix® RJD

Order information: Analogue SenTix® pH electrodes

Model	Description	Order no.
pH electrodes with gel electrolyte		
SenTix® 20	Gel electrode, S7 plug head	103630
SenTix® 21	Gel electrode, DIN cable	103631
SenTix® 21-3	Gel electrode, DIN cable, 3 m	103632
SenTix® 22	Gel electrode, BNC cable	103633
SenTix® 41	Gel electrode with temperature sensor, DIN cable	103635
SenTix®41-3	Gel electrode with temperature sensor, DIN cable, 3 m	103636
SenTix®42	Gel electrode with temperature sensor, BNC cable	103637
pH electrodes with liquid electrolyte		
SenTix® 60	Precision electrode, S7 plug head	103639
SenTix® 61	Precision electrode, DIN cable	103640
SenTix® 62	Precision electrode, BNC cable	103641
SenTix® 81	Precision electrode with temperature sensor, DIN cable	103642
SenTix® 82	Precision electrode with temperature sensor, BNC cable	103643
SenTix® 51	Plastic shaft, temperature sensor, DIN cable	103651
SenTix® 52	Plastic shaft, temperature sensor, BNC cable	103652
SenTix® 91	Precision electrode 170 mm, with temperature sensor, DIN cable	103695
pH electrodes for special applications		
SenTix® H	pH electrode for highly alkaline solutions, S7 plug head	103644
SenTix® Sp	pH spear-type electrode, S7 plug head	103645
SenTix® Sur	pH surface electrode, S7 plug head	103646
SenTix® Mic	pH-micro electrode, 5 mm membrane	103647
SenTix® HW	pH electrode for low-conducting samples, S7 plug head	103650
SenTix® Mic-D	pH micro electrode, 3 mm membrane, DIN cable	103660
SenTix® Mic-B	pH micro electrode, 3 mm membrane, BNC cable	103661
SenTix® Sp-DIN	pH spear-type electrode, DIN cable	103730
SenTix® HWD	pH electrode for emulsions etc. with temperature sensor, DIN cable	103731
SenTix® RJD	pH electrode low maintenance, polymer electrolyte, temperature sensor, DIN cable	103732

Accessories & cables see price list or www.WTW.com

Calibration and maintenance accessories

In practice, work reference buffer solutions are used, which are obtained by comparison with primary or secondary material. Common WTW-pH buffers correspond to these requirements. Certificates document the respective pH value uncertainty of the solution.

Buffer bottles by WTW

- **Standard (DIN/NIST) buffer solutions PL 2/4/7/9/12** (250 ml container)
- Technical buffer solutions **TEP** (1 litre), **TPL** (250 ml): pH buffer by WTW - precise and traceable to PTB/NIST in two container sizes with built-in dosing vessel standard buffer

- **Easy to dose**
- **Easy to use**
- **Safe calibration**

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Usable Buffers

		PL 4/7/9 DIN/NIST	STAPL 4/7/9 DIN/NIST	TEP 4/7 Trace	TEP 10 Trace	TPL 4/7 Trace	TPL 10 Trace
Benchtop meters							
inoLab®		●	●	●	●	●	●
Portable meters							
ProfiLine	**pH 3110, pH 3210, pH 3310**	●	●	●	●	●	●
	pH/Cond 3320, Multi 3320, pH/ION 3310	●*	●*	●	●	●	●
	pH 315i, pH 330i, pH 340i, pH/ION 340i	●	●	●	●	●	●
	pH/Cond 340i, pH/Oxi 340i, Multi 340i, Multi 350i,	●*	●*	●	●	●	●
MultiLine®	**Multi 3410 IDS, Multi 3420 IDS, Multi 3430 IDS, Multi 3510 IDS, Multi 3620 IDS, Multi 3630 IDS**	●*	●*	●	●	●	●
VARIO® pH		●	●	●	●	●	●
Field meters ProfiLine							
pH 197i/1970i		●	●	●	●	●	●
Multi 197i/1970i		●*	●*	●	●	●	●

* not Multi 340i, Multi 197i/1970i

Buffer solutions in glass ampoules

- **STAPL-4/7/9 precision DIN / NIST buffer in ampoules with +/- 0.01 pH accuracy**
- QSC (Quality Sensor Control): With the **QSC Kit** consisting of three precision DIN buffers (pH 4.01, pH 6.87 and pH 9.18 with an accuracy of respectively ± 0.01 pH at 25 °C) in glass ampoules, an initial calibration can be carried out with IDS pH electrodes. Ideal for quality control: All following calibrations are compared with this calibration and thereby exactly deliver the current state of the sensor.

- **Single use portions**
- **Steam sterilised and 5 year shelf life**
- **Precision buffer with an accuracy of ± 0.01 pH**

Model	Description	Order no.
TEP 4	Technical buffer solution, 1 bottle with 1 l: pH 4.01	108700
TEP 7	Technical buffer solution, 1 bottle with 1 l: pH 7.00	108702
TEP 10 Trace	Technical buffer solution, 1 bottle with 1 l: pH 10.01	108703
TPL 4	Technical buffer solution, 1 bottle with 250 ml: pH 4.01	108800
TPL 7	Technical buffer solution, 1 bottle with 250 ml: pH 7.00	108802
TPL 10 Trace	Technical buffer solution, 1 bottle with 250 ml: pH 10.01	108805
STAPL-4/7/9	Assortment of working reference buffer solutions pH 4.01, pH 6.87, pH 9.18. Traceable to NIST / PTB standards. Steam sterilized, 10 x 6 glass ampoules of 20 ml each.	109020
PL 4	Standard (DIN/NIST) buffer solution, 1 bottle with 250 ml: pH 4.006 /4.01	109110
PL 7	Standard (DIN/NIST) buffer solution, 1 bottle with 250 ml: pH 6.865 /6.87	109120
PL 9	Standard (DIN/NIST) buffer solution, 1 bottle with 250 ml: pH 9.180 /9.18	109130
KCl-250	Reference electrolyte, 1 bottle with 250 ml KCl solution 3 mol/l	109705

Further accessories see price list or www.WTW.com

ORP measurement

Content

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Applications and meters overview

The ORP measurement maps the intensity of oxidation and reduction reactions proceeding in aqueous solution. The resulting voltage signal is for example used as a measure of the cleaning power of disinfectants such as chlorine or ozone in the swimming pool.

✓ yes
● yes
✓ recommended
✓ recommended for some applications
– not recommended

	Digital			Analogue			Digital			Analogue					
	Laboratory ORP meters						Portable ORP meters								
	inoLab® IDS			inoLab®			MultiLine® IDS			ProfiLine					
	Multi 9630	Multi 9620	Multi 9310	pH/ION 7320	pH 7310	pH 7110	Multi 3630	Multi 3620	Multi 3510	Multi 3320	pH/Cond 3320	pH/ION 3310	pH 3310	pH 3110	pHotoFlex® pH
2 parameters simultaneously*	✓	✓		✓			✓	✓		✓	✓				
3 parameters simultaneously	✓						✓								
ORP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Additional parameters	●	●	●	●			●	●	●	●	●	●			●*
Routine measurements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Routine measurements with documentation	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
AQA with documentation	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
R&D High resolution and precision	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Control measurements	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
LIMS connection	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Quality assurance	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	–	✓
Education	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Service	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laboratory measurements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Field measurements	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓
Depth measurements	–	–	–	–	–	–	✓	✓	✓	–	–	–	–	–	–
PC connection	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
Memory	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
USB interface	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Graphic display			✓	✓	✓				✓	✓	✓	✓	✓		✓
Color graphic display	✓	✓					✓	✓							
Compatible sensors															
Digital IDS electrodes															
IDS ORP electrodes 72	✓	✓	✓				✓	✓	✓						
Analogue electrodes															
ORP electrodes 73	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Multi 9630	Multi 9620	Multi 9310	pH/ION 7320	pH 7310	pH 7110	Multi 3630	Multi 3620	Multi 3510	Multi 3320	pH/Cond 3320	pH/ION 3310	pH 3310	pH 3110	pHotoFlex® pH
see page	40	40	41	56	56	57	44	45	46	49	50	47	61	62	145

* see chapter "Photometric determination" on page 130

ORP measurements can be carried out with all WTW pH/mV meters.

ORP electrodes

All ORP electrodes consist of a metal electrode made of a precious metal and a reference electrode. As with all SenTix® and SensoLyt® electrodes, the reference system is silver/silver chloride, typically with a platinum electrode.

WTW meters with pH function also measure the ORP voltage

IDS ORP electrodes - digital

- **Short response time due to ideal contact to the sample**
- **Precise measurement results due to liquid electrolyte**
- **Refillable for a long life**
- **Platinum electrode for universal application**

SenTix® ORP-T900 (-P)

ORP electrodes with liquid electrolyte and ceramic diaphragm

- **No maintenance due to life-long KCl supply**
- **Insensitive to soiling due to open connection**
- **Wide application range due to universal platinum metal electrode**

SensoLyt® ORP 900-P

ORP electrodes with polymer electrolyte and split ring or hole junction

Technical data and order information:

see page 32

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SenTix® ORP electrodes – analogue

Technical data and order information: SenTix® ORP electrodes – analogue

	SenTix® ORP	SenTix® Ag*	SenTix® Au	SenTix® PtR
Order no.	103648	103664	103665	103666
working temperature °C	0 … 100 °C	-5 … 100 °C	-5 … 100 °C	-5 … 100 °C
Reference electrolyte	KCl 3 mol/l	ELY/ORP/Ag	KCl 3 mol/l	Gel
Sensor	Platinum	Silver	Gold	Platinum
Sensor form	(4 mm)	Cylinder cap	Cylinder cap	(6 mm)
Diaphragm	Ceramics	Ceramics	Ceramics	Split ring
Shaft material	Glass	Glass	Glass	Glass
Shaft length (±2 mm)	120 mm	120 mm	120 mm	120 mm
Shaft-Ø (±0,5 mm)	12 mm	12 mm	12 mm	12 mm
Temperature sensor	–	–	–	–
Connection	AS/DIN, AS/DIN-3, AS/BNC	AS/DIN, AS/DIN-3, AS/BNC	AS/DIN, AS/DIN-3, AS/BNC	AS/DIN, AS/DIN-3, AS/BNC

* for argentometry

SenTix® ORP

Universal ORP electrode with platinum round, glass shaft

SenTix® Ag

Combined Ag electrode (argentometry)

SenTix® Au

Au ORP electrode with AU cap, liquid electrolyte

SenTix® PtR

Maintenance-free Pt ORP electrode with polymer electrolyte

Order information: Test and maintenance agents for the ORP measurement

Model	Description	Order no.
RH 28	ORP buffer solution, 1 bottle with 250 ml: pH 7, U_H = 427 mV	109740
ELY/ORP/AG	Electrolyte with 2 mol/l KNO_3 + 0.001 mol/l KCl for combined ORP electrode with silver electrode	109735
Accessories & cables see price list or www.WTW.com		

Ion-selective measurement

Content

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Applications and meters overview

Ion-selective measurement is an electrochemical process in which the concentration of a multitude of dissolved ions in liquids can be quantitatively determined with suitable electrodes.

✓ yes
● yes

✓ recommended
✓ recommended for some applications
– not recommended

	Digital		Analogue	Analogue		
	Benchtop ISE meters			Portable ISE meters		
	inoLab® IDS		inoLab®	ProfiLine		
	Multi 9630	Multi 9620	pH/ION 7320	Multi 3320	pH/Cond 3320	pH/ION 3310
2 parameters simultaneously*	✓	✓	✓	✓	✓	
3 parameters simultaneously	✓					
ISE direct measurement	●	●	●	●	●	●
Incremental methods	●	●	●			
Additional parameters	●	●	●	●	●	●
Routine measurements	✓	✓	✓	✓	✓	✓
Routine measurements with documentation	✓	✓	✓	✓	✓	✓
AQA with documentation	✓	✓	✓	✓	✓	✓
R&D High resolution and precision	✓	✓	✓	✓	✓	✓
Control measurements	✓	✓	✓	✓	✓	✓
LIMS connection	✓	✓	✓	✓	✓	✓
Quality assurance	✓	✓	✓	✓	✓	✓
Education	✓	✓	✓	✓	✓	✓
Service	–	–	–	✓	✓	✓
Laboratory measurements	✓	✓	✓	✓	✓	✓
Field measurements	–	–	–	✓	✓	✓
PC connection	✓	✓	✓	✓	✓	✓
Memory	✓	✓	✓	✓	✓	✓
USB interface	✓	✓	✓	✓	✓	✓
Analogue/Digital adapter necessary	✓	✓				
Graphic display			✓	✓	✓	✓
Color graphic display	✓	✓				
	Compatible sensors					
	Analogue electrodes					
Combined ISE 82	✓	✓	✓	✓	✓	✓
Half cells 83	✓	✓	✓			✓
	Multi 9630	Multi 9620	pH/ION 7320	Multi 3320	pH/Cond 3320	pH/ION 3310
see page	*40*	*40*	*56*	*49*	*50*	*80*

Benchtop meters for ion-selective measurement

Ion-selective measurement can be performed in two general ways:
Simple, direct potentiometric determination via a linear or non-linear calibration curve, or determination via the so-called increment methods.

All state-of-the-art WTW laboratory meters with ISE function have both functionalities.

inoLab® IDS – digital

inoLab® Multi 9630 IDS: Measure three parameters simultaneously

The digital inoLab® multi parameter meter for IDS sensors for parallel measurement of the same or different parameters. Requires the ADA 94pH/IDS DIN or ADA 94pH/IDS BNC for the ISE measurement.

see page 40

inoLab® Multi 9630 IDS

inoLab® Multi 9620 IDS: Measure two parameters simultaneously

Similar to inoLab® Multi 9630 IDS, but up to two sensors can be connected. Requires the ADA 94pH/IDS DIN or ADA 94pH/IDS BNC for the ISE measurement.

see page 40

inoLab® Multi 9620 IDS

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inoLab® – analogue

inoLab® pH/ION 7320P

inoLab
innovations that make sense

3 year warranty IP 43 CE

Technical specifications: inoLab® analogue benchtop ion selective meters

		inoLab® pH/ION 7320
Measurement ranges/resolution	**pH**	-2.000 ... +20.000 pH units
	mV	-1200 ... +1200 mV -2500 ... +2500 mV
	Temperature	-5 ... +105 °C / 0,1 °C
	Concentration (mg/l, µmol/l, mg/kg, ppm, %)	0.000 ... 9.999 10.00 ... 99.99 100.0 ... 999.9 1000 ... 999999
Special functions		Known addition (single), known subtraction, sample addition, sample subtraction, blank value correction
Accuracy (±1 digit)	**pH**	± 0.005 pH units -± 0.01 pH units
	mV	±0.3 mV, ±1 mV
	Temperature	±0.1 K
Calibration MultiCal® calibration automatic:		
	AutoCal	2-/3-/4-/5 point
	AutoCal-Tec	2-/3-/4-/5 point
	ConCal®	2-/3-/4-/5 point
	ISECal	2 bis 7 points

inoLab® pH/ION 7320: Concentration determination with two measurement channels

inoLab® pH/ION 7320P

- **Two channel meter for simultaneous measurements of pH, ion concentration or ORP**
- **Data output via USB interface for rapid data transfer in *.csv format or via an optionally built-in printer**
- **CMC function for measuring range monitoring with pH**

The inoLab® pH / ION 7320 is a specialized pH and ionic concentration meter that can measure pH or concentration on each of its two channels simultaneously.

Reliable measurements

- Repeatable measurement results due to active automatic AutoRead function with detection of stable measuring values
- The CMC function for pH visualises the optimal measuring range for correct measurement
- Graphic display with plain text menus for convenient and safe operation
- Input of the electrode serial number for the GLP/AQA compliant documentation
- Transmission of all data in *.csv format via USB interface to PC, formatted transfer to Excel (MultiLab® Importer, included in the delivery or as a download)
- Output directly in the meter via optional built-in printer

Flexible and high performance:

- 1 to 5 point calibration with pH
- 2 to 7 point calibration with ion measurement, also non-linear
- Blank value correction, incremental methods: Known addition, known subtraction, sample addition, sample subtraction
- Concentration specification in different units
- Selectable AutoRead criterion
- DIN or BNC version
- Backlit graphic display with CMC display

Order information: inoLab® analogue benchtop Ion-selective meters

Model	Description	Order no.
inoLab® pH/ION 7320	Precise and convenient pH/mV/ISE 2 channel benchtop meter	1GA330
inoLab® pH/ION 7320P	Precise and convenient pH/mV/ISE 2 channel benchtop meter with built-in printer	1GA330P
inoLab® pH/ION 7320 BNC	Precise and convenient pH/mV/ISE 2 channel benchtop meter with BNC connectors	1GA340

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Portable meters for ion-selective measurement

3 year Warranty | IP 67 | CE

ProfiLine Multi 3320: The environment specialist

In addition to pH, ORP potential, conductivity and dissolved oxygen (electrochemical), the Multi 3320 also measures ion concentration with combined electrodes.

see page 49

ProfiLine Multi 3320

ProfiLine pH/Cond 3320: Perfect in process

The most important parameters pH/mV and conductivity are complemented by the possibility for ISE measurement with combined ISE electrodes.

see page 50

ProfiLine pH/Cond 3320

Specifications

ProfiLine		**pH/ION 3310**
pH measurement	**pH**	-2.0 ... +20.0 ± 0.1 pH -2.00 ... +20.00 ± 0.01 pH -2.000 ... +19,999 ± 0,005 pH
	mV	± 1200.0 mV ± 0.3 mV ± (2500 ± 1) mV
ISE measurement	**Concentration** (mg/l, µmol/l, mg/kg, ppm, %)	0.000 … 9.999 10.00 … 99.99 100.0 … 999.9 1000 … 999999
Temperature		-5.0 … 105.0 °C ± 0.1 °C
CMC		Yes
Calibration		1-, 2-, 3-, 4-, 5-point WTW technical buffers, DIN, NIST as well as further 22 buffer sets
	ISECal	2 to 7 point

ProfiLine pH/ION 3310: pH-, mV- and concentration measurement from a single source

ProfiLine pH/ION 3310

- **pH and ISE measurement**
- **2 to 7 point calibration, also non-linear**
- **Convenient menu control**

The pH/ION 3310 is a portable meter for outdoor use for combined pH and ISE measurements. All applications are covered with 1 to 5 point calibration for pH as well as a 2 to 7 point calibration for the direct potentiometric determination with ISE's, including the non-linear range.

Reliable measurements

- Repeatable measurement results with the automatic AutoRead function for detecting stable measurement values
- The CMC function for pH visualises the optimal measuring range and supports correct measuring
- Graphic display with plain text menus for convenient and safe operation GLP/AQA compliant documentation
- Transmission of all data in *.csv format via USB interface to PC; if desired, formatted transfer to Excel (MultiLab® Importer, included in the delivery or as download)

Flexible and high performance:

- 1 to 5 point calibration for pH
- 2 to 7 point calibration for ion measurements, including the non-linear range
- Concentration readings in different units
- Backlit graphics display

Order information: Portable analogue ISE meters

Model	Description	Order no.
pH/ION 3310	Professional pH/mV/ISE meter, IP 67 waterproof	2GA310

WTW a xylem brand
Xylem Analytics Germany Sales GmbH & Co. KG, WTW
Dr.-Karl-Slevogt-Straße 1 · D-82362 Weilheim · Germany · Ph: +49 881 1830 · Fax: +49 881 183-420 · Info.WTW@Xyleminc.com
www.WTW.com

Application table

Ion type	Application
Ammonium (NH_4^+)	Wastewater
Bromide (Br^-)	Wine, plants
Calcium (Ca^{2+})	Milk products
Chloride (Cl^-)	Drinking water, diet foods, mineral water
Copper (Cu^{2+})	Galvanic baths
Fluoride (F^-)	Toothpaste, drinking water, cement
Nitrate (NO_3^-)[S]	Baby food, fertiliser, wastewater
Potassium (K^+)[S]	Wine, fertiliser
Silver (Ag^+)[S]	Galvanic baths
Sodium (Na^+)[S]	Boiler feed water, diet foods, wine
Sulphide (S^{2-})[S]	Proteins, sediments

Ion-selective electrodes

Ion-selective and gas-sensitive electrodes are used for measuring the dissolved concentration of specific ions or gases in water. Similar to the pH electrode, the membrane interacts with the dissolved ions and delivers a concentration-dependent voltage signal that is converted to the corresponding measurement result.

Combined ISE and GSE electrodes

- **Space-saving through integrated reference electrode**
- **11 different types available - broad selection of applications including ammonium measurement**
- **Slim and space-saving design with 12 mm shaft diameter**
- **Series 800 with 1 m fixed cable and DIN or BNC plug**

Technical specifications and order information: inoLab® analogue Ion-selective electrodes

	Combined ISE and GSE electrodes				
					
	NH 500/2	**Ca 800**	**Ag/S 800**	**Cl 800**	**CN 800**
Determinable ions	Ammonium	Calcium, Magnesium	Silver, Sulphide	Chloride	Cyanide
Membrane	–	L	S	S	S
Contains reference electrode	Yes	Yes	Yes	Yes	Yes
Measuring range	0.02 to 900 mg/l, With 3 exchange heads and 50 ml electrolyte solution	0.02 ... 40000 mg/l 5 x 10^{-7} ... 1 mol/l	0.01 ... 108000 mg/l 10-7 ... 1 mol/l 0.003 ... 32000 mg/l 10^{-7} ... 1 mol/l	2 ... 35000 mg/l 5 x 10^{-5} ... 1 mol/l	0.2 ... 260 mg/l 8 x 10^{-6} ... 10^{-2} mol/l
Bridge electrolyte		ELY/BR/503	ELY/BR/503	ELY/BR/503	ELY/BR/503
Ionic strength-adjusting solution	MZ/NH3/CN	ISA/Ca	ISA/FK (Ag) or according to the operating instructions for sulphide measurement	ISA/FK	
Standard solutions (conc. 10 g/l)	ES/NH_4	ES/Ca	Standard solutions must be prepared freshly③	ES/CI	MZ/NH3/CN Standard solutions must be prepared freshly
pH range	4–12	2.5–11	2–12	2–12	0–14
Order No. DIN variant	106395 (S7 plug head)	106655	106651	106661	106663
Order No. BNC variant		106654	106650	106660	106662
Order no. Exchange head		106656			

① S = Solid electrode, L = Matrix electrode, G = Glass electrodes
② Titration
③ Preparation according to operating manual
④ Recipes for additionally required solutions are specified in the application reporst and operating manuals.

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Combined ISE and GSE electrodes					ISE half cell
					
Cu 800	**K 800**	**Br 800**	**F 800**	**NO 800**	
Copper, Nickel[2]	Potassium[4]	Bromide	Fluoride, Aluminium, Phosphate[2], Lithium[2]	Nitrate	Sodium
S	L	S	S	L	G
Yes	Yes	Yes	Yes	Yes	requires reference electrode R 503/D
0.0006 ... 6400 mg/l 10^{-8} ... 10^{-1} mol/l	0.04 ... 39000 mg/l 10^{-6} ... 1 mol/l	0.4 ... 79000 mg/l 5 x 10^{-6} ... 1 mol/l	0.02 ... sat. mg/l 10^{-6} ... sat. mol/l	0.4 … 62000 mg/l,	0.05 … 23000 mg/l
ELY/BR/503	ELY/BR/503/K	ELY/BR/503	ELY/BR/503	ELY/BR/503/N	ELY/BR/503
ISA/FK	ISA/K	ISA/FK	TISAB	TISAB/NO_3	ISA/Na
ES/Cu	ES/K	ES/Br	ES/F	ES/NO_3	ES/Na
2–6	2–12	1–12	5–7	2.5–11	>10
106665	106671	106653	106667	106675	106375 (S7 plug head)
106664	106670	106652	106666	106674	
	106672			106676	