MultiLab

pH measurement

Content

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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.

Legend

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

	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
	Digital (inoLab® IDS)			Analogue (inoLab®)			Digital (MultiLine® IDS)			Analogue (ProfiLine)					pHotoFlex® pH
	Benchtop pH meters						Portable pH meters								
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	✓	✓		✓						✓	✓	✓			
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

inoLab

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.

inoLab® Multi 9630 IDS

inoLab® Multi 9620 IDS: Measure two parameters simultaneously

Two channel version of the inoLab® Multi 9630 IDS.

inoLab® Multi 9310 IDS: Digital single parameter solution

inoLab® Multi 9620 IDS

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.

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.

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

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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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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

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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.

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.

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.

MultiLine® Multi 3510 IDS

pHotoFlex® Series

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

pHotoFlex® pH

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ProfiLine – analogue

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

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

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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.

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).

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.

ProfiLine pH/ION 3310

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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

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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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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.

(1)   (2)   (3)   (4)

(5)

(6)

(7)

(8)   (9)   (10)

(11)

(12)

(13)   (14)

(15)

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*
H₂S-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

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 SenTix® ...	pH electrodes with gel electrolyte							pH electrodes with liquid electrolyte						
	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 SenTix® ...	pH electrodes for special applications									
	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		⑥/⑦	⑥/⑦	⑥		⑥+⑧

* not contained in the scope of delivery   ①: Plug head,   ②: Fixed cable,

** from grinding upper edge   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.

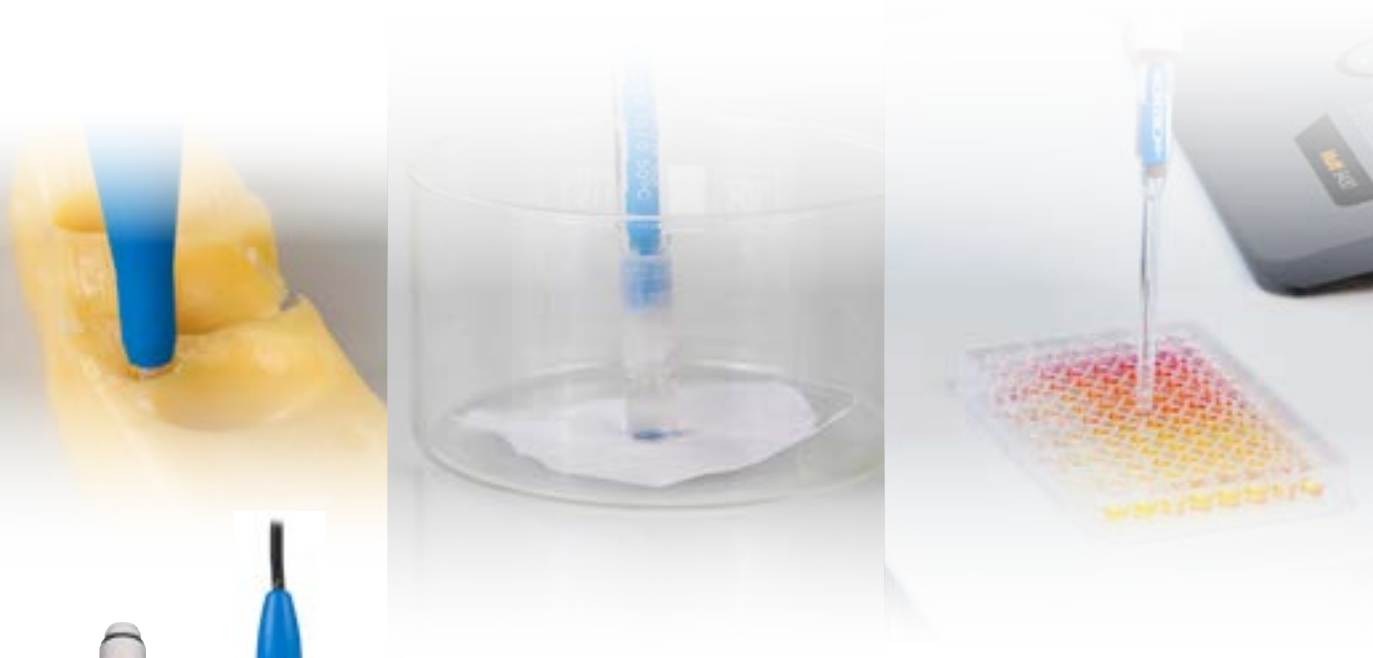SenTix® 52   SenTix® 60   SenTix® 61   SenTix® 81   SenTix® 91

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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 |

Multi-Lab SRL Romania Tel.021 3127144 Fax.021 3127141 | contact@multilab.ro www.multilab.ro www.labshop.ro www.eulab.eu

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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