pH measurement

Content

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

	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

Side tabs: Parameters · Multi-parameter · pH · ORP · ISE · Dissolved Oxygen · Conductivity · BOD/Respiration · Photometry · Turbidity · Software, Documentation

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)

WTW
a **xylem** brand

www.WTW.com

Parameters · Multi-Parameter · pH · ORP · ISE · Dissolved Oxygen · Conductivity · BOD/Respiration · Photometry · Turbidity · Software, Documentation

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		

Parameters

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen

Conductivity

BOD/Respiration

Photometry

Turbidity

Software, Documentation

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	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