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Sensors for Field & Lab

Electrodes, Sensors & Measurement Cells
for your Application

WTW
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Sensors for Field & Lab



80

We have been developing and manufacturing glass electrodes for more than 80 years. Our electrodes are used for important tasks in worldwide laboratories with high demands. What began back then with the patent for pH electrodes now includes a range of several hundred different sensors: whether ultra-pure water, jam, wine, creams or drinking water – we offer the right electrode for every conceivable application. Our extensive electrode program is as diverse as the applications.



Sensors - Overview



pH Field Electrodes

- Robust field electrodes
- Plastic shaft
- Optional build-in temperature sensor
- Gel filling or liquid filling
- Also available as digital (IDS) sensors



pH Lab Electrodes

- High performance lab electrodes
- Glass shaft with precision glass
- Optional build-in temperature sensor
- Penetration- / Surface- / Micro- / Split ring-Electrodes
- Gel filling or liquid filling
- Also available as digital (IDS) sensors



ORP Electrodes

- Metal electrode made of stainless steel
- Incl. reference electrode
- Reference system silver/silver chloride
- Also available as digital (IDS) sensors



Conductivity Cells

- Two-pole cells
- Four-pole cells
- Graphite
- Stainless steel
- Also available as digital (IDS) sensors



Oxygen Sensors

- Galvanic dissolved oxygen sensors
- Self-stirring dissolved oxygen sensors
- Optical dissolved oxygen sensors (DIN ISO 17289)
- Also available as digital (IDS) sensors



Ion-selective Electrodes

- Combined ISE & GSE electrodes
- Glass electrodes
- Matrix electrodes
- Solid state electrodes

Sensors - analog or digital?

The powerful base

- Analog and digital models are based on the same, proven **quality electrodes**.
- **Low-resistance membrane glasses** guarantee stable measurement signals even at low temperatures.
- **Silver ion-free reference electrolyte** in combination with the unique **platinum wire diaphragm** prevents measurement problems caused by precipitating silver compounds.
- **Functional slider** for opening and safely closing the refill opening of liquid electrolyte electrodes.

Analog Electrodes

- The **conversion** of the raw signal into pH takes place **in the meter**.
- **Connection options:** Fixed cable (1 meter or 3 meter) with water-proof DIN plug, BNC plug or S7 plug head.

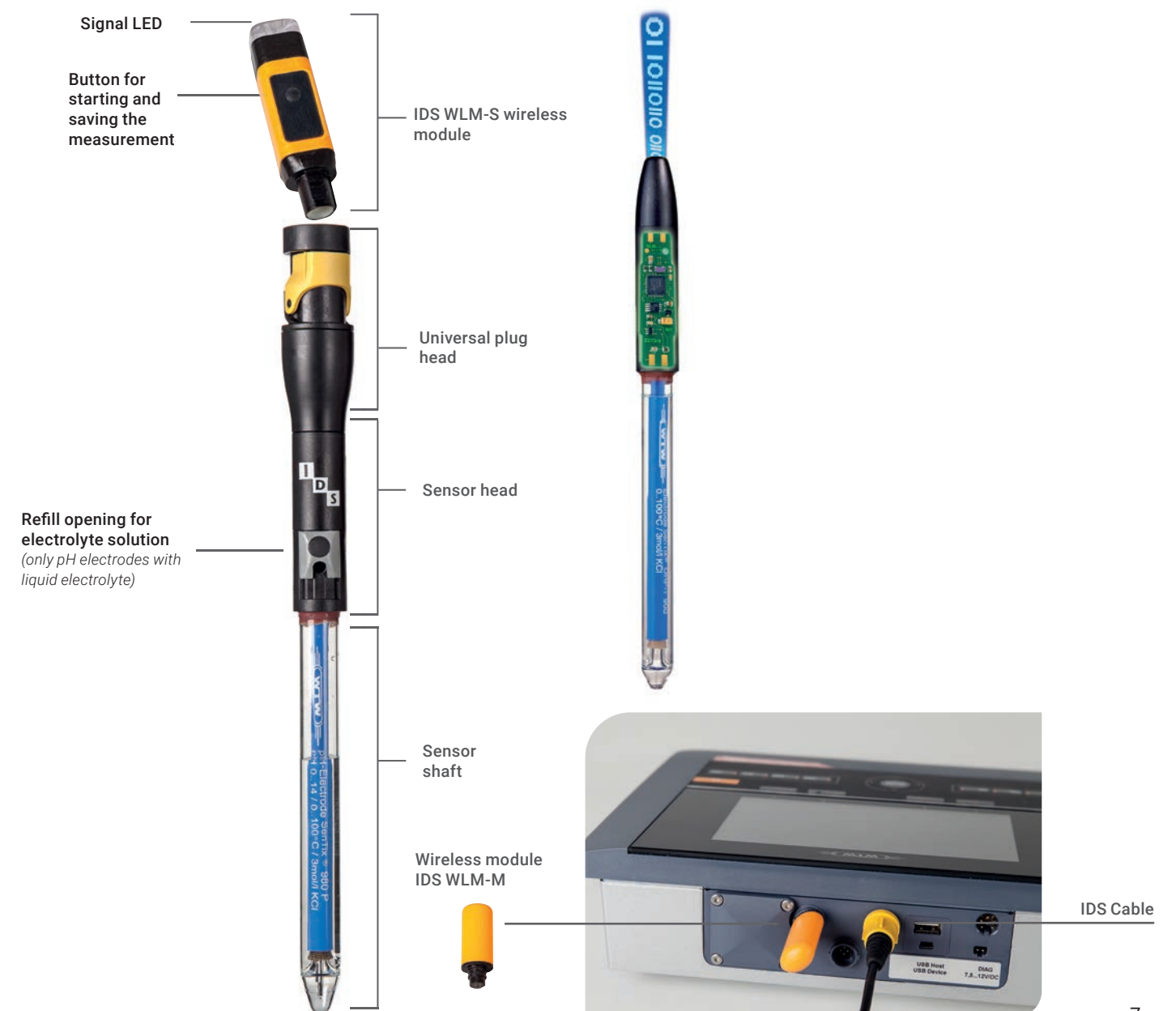
Digital IDS electrodes

- **Conversion** of analog measurement signals into digital values **directly in the sensor** prevents interference and guarantees fail-safe data transmission.
- **Cables up to 100 m length** available.
- The IDS electrodes are available with **fixed cable** or **plug head**. Cables of different lengths or wireless modules can be connected to the plug head.
- Automatic transmission of **sensor serial number** and **calibration record** of the sensor increase data integrity.
- Comprehensive support for **GLP-compliant data acquisition**.
- Universal plug for connection **to any IDS portable or lab instrument** for flexible use on site or in the lab.



Wireless work with flexible sensor connections

- The IDS electrodes are available with **fixed cable** or with **plug head** connections.
- Versatile: A connection cable **from 1.5 m to 100 m in length** or a wireless module with a range of up to 10 m can be connected to the plug head.
- Wireless operation **allows physical separation**: measuring at the sample and documenting at the workplace.
- **Secure** 1:1 connection.
- **Great flexibility** due to universal applicability of the wireless modules for various IDS sensors.
- Transfer of measurement data and metadata via IDS-Gate, directly into a **database** or into a **LIMS** system.



pH Electrodes



pH Electrodes

The electrodes consist of a measuring electrode and a reference electrode. pH electrodes from Xylem Analytics are usually combined pH electrodes or combination electrodes, consisting of a glass and reference electrode built into one unit. The glass membrane of our electrodes is sensitive to hydrogen ions and filled with a buffer solution. There is a reference electrolyte in the reference electrode. Immersion in a measuring solution causes a change in voltage - this change in voltage is recorded as a signal (analog or digital) and converted into a pH value.

Glass

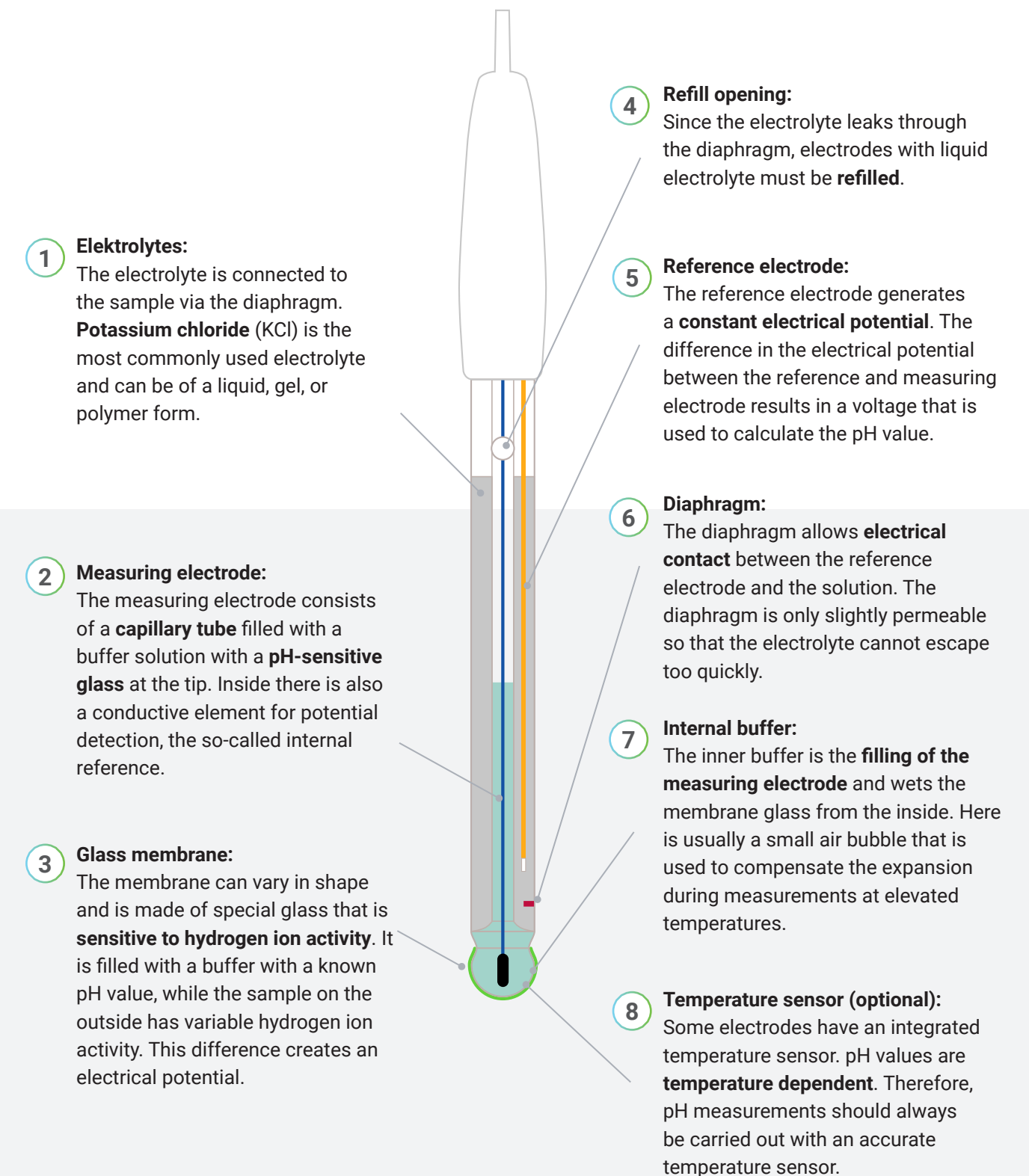
Today there is a large amount of different pH glasses, which should be selected according to the application. Due to the large amount of different purposes, several types of membrane glasses are required to reach the optimum measurement reliability and lifetime.



Precision glassblowing

pH Electrodes - Design

Glass electrodes consist of three essential components: the glass membrane, the inner buffer and the measuring electrode. While the inner buffer and the measuring electrode can be used universally, the shape and properties of the glass membrane must be selected according to the respective sample type. Important criteria are the consistency, volume and temperature of the sample, which measuring range is expected and the concentration of the ions in the solution to be measured.



pH Field Electrodes with Plastic Shaft

For water, wastewater and predominantly aqueous samples

Ideal for portable measurements, but also for routine measurements in the lab; with or without built-in temperature sensor.

	Analog										
Model	SenTix 20	SenTix 21	SenTix 21-3	SenTix 22	SenTix 41	SenTix 41-3	SenTix 42	SenTix 43	SenTix 44	SenTix 46	SenTix 47
Order-No.	103630	103631	103632	103633	103635	103636	103637	103805	103806	103807	103808
Type/Application	Low-maintenance pH electrodes without temperature sensor				Low-maintenance pH electrodes with temperature sensor						
											
Shaft material	Plastic				Plastic						
Temperature sensor	—				NTC 30 kOhm			Pt 1000		NTC 30 kOhm	NTC 10 kOhm
Membrane shape	Cylindric				Cylindric						
Reference electrolyte	Gel				Gel						
Diaphragm	Fiber				Fiber						
Meas. range pH	0 ... 14 pH				0 ... 14 pH						
Temperature range	0 ... 80 °C				0 ... 80 °C						
Membrane resistance	< 1 GΩ				< 1 GΩ						
Shaft length	120 mm				120 mm						
Shaft diameter	12 mm				12 mm						
Connection	S7 plug head	Waterproof DIN plug		BNC plug	Waterproof DIN plug + 4 mm banana plug		BNC plug + 4 mm banana plug	Waterproof DIN plug + 4 mm banana plug	BNC plug + 4 mm banana plug	BNC plug + Cinch plug	BNC plug + 2.5 mm Jack plug (for Sartorius devices)
Cable	withouth cable*	1 m fixed cable	3 m fixed cable	1 m fixed cable	1 m fixed cable	3 m fixed cable	1 m fixed cable				

*=Suitable connection cables can be found on page 28

pH measurement in **non-aqueous solutions?**
We have the right electrode



					Digital (IDS)							
SenTix 51	SenTix 52	SenTix 57	SenTix Top 41	SenTix Top 46	SenTix Top 940	SenTix Sp-T 900	SenTix Sp-T 900-P	SenTix 940	SenTix 940-3	SenTix 940-P	SenTix 950	SenTix 950-P
103651	103652	103809	103816	103817	103744	103752	103766	103740	103741	103760	103750	103761
pH electrodes with temperature sensor			pH electrodes with double reference system and polymer electrolyte		Digital pH penetrator electrodes		Digital low-maintenance pH electrodes			Digital pH electrodes		
												
Plastic			PEEK Shaft / Plastic		Plastic		Plastic			Plastic		
NTC 30 kOhm		NTC 10 kOhm	NTC 30 kOhm		NTC 30 kOhm		NTC 30 kOhm			NTC 30 kOhm		
Cylindric			Cylindric		Spear		Cylindric			Cylindric		
KCl 3 mol/l Ag+ free			Duralid®		Referid®		Gel			KCl 3 mol/l Ag+ free		
Ceramic			Double junction / hole		Hole		Fiber			Ceramic		
0 ... 14 pH			0 ... 14 pH		2 ... 13 pH		0 ... 14 pH			0 ... 14 pH		
0 ... 80 °C			-5 ... 100 °C		0 ... 80 °C		0 ... 80 °C			0 ... 80 °C		
< 1 GΩ			< 400 MΩ		< 400 MΩ		< 1 GΩ			< 1 GΩ		
120 mm			120 mm		65/25 mm		120 mm			120 mm		
12 mm			12 mm		15/5 mm		12 mm			12 mm		
Waterproof DIN plug + 4 mm banana plug	BNC plug + 4 mm banana plug	BNC plug + 2.5 mm Jack plug (for Sartorius devices)	Waterproof DIN plug + 4 mm banana plug	BNC plug + Cinch plug	Waterproof digital plug	Waterproof digital plug	Plug head	Waterproof digital plug	Plug head	Waterproof digital plug	Plug head	Plug head
1 m fixed cable			1 m fixed cable		1.5 m fixed cable	1.5 m fixed cable	withouth cable*	1.5 m fixed cable	3 m fixed cable	withouth cable*	1.5 m fixed cable	withouth cable*

pH Lab Electrodes with Glass Shaft

For demanding measurements in the lab

Our laboratory electrodes are characterized by fast response, high precision and a long service life and can also be used in difficult samples.

pH measurement in **non-aqueous solutions**?
We have the right electrode



N 6480 ETH



	Analog									
Model	SenTix 60	SenTix 61	SenTix 62	SenTix 81	SenTix 82	SenTix 83	SenTix 84	SenTix 85	SenTix 86	SenTix 87
Order-No.	103639	103640	103641	103642	103643	103810	103811	103812	103813	103814
Type/Application	Precision pH electrodes without temperature sensor			Precision pH electrodes with temperature sensor						
										
Shaft material	Glass			Glass						
Temperature sensor	—			NTC 30 kOhm		Pt 1000		NTC 30 kOhm		NTC 10 kOhm
Membrane shape	Conic			Conic						
Reference electrolyte	KCl 3 mol/l Ag+ free			KCl 3 mol/l Ag+ free						
Diaphragm	Platinum wire			Platinum wire						
Meas. range pH	0 ... 14 pH			0 ... 14 pH						
Temperature range	0 ... 100 °C			0 ... 100 °C						
Membrane resistance	<600 MΩ			<600 MΩ						
Shaft length	120 mm			120 mm						
Shaft diameter	12 mm			12 mm						
Connection	S7 plug head	Waterproof DIN plug	BNC plug	Waterproof DIN plug + 4 mm banana plug	BNC plug + 4 mm banana plug	Waterproof DIN plug + 4 mm banana plug	BNC plug + 4 mm banana plug	BNC plug + 2 x 4 mm banana plug	BNC plug + Cinch plug	BNC plug + 2,5 mm Jack plug (for Sartorius devices)
Cable	withouth cable*	1 m fixed cable		1 m fixed cable						

				Digital (IDS)						
SenTix 91	SenTix H	SenTix HW	SenTix HWD	SenTix HW-T 900	SenTix HW-T 900-P	SenTix 945	SenTix 945-P	SenTix 980	SenTix 980-P	SensoLyt 900-P
103695	103644	103650	103731	103753	103767	103743	103764	103780	103762	103748
Precision pH electrode with temperature sensor	pH special electrode with ground joint diaphragm					Digital low-maintenance precision pH electrodes		Digital precision pH electrodes		pH electrode with polymer electrolyte, pressure resistant up to 10 bar
										
Glass	Glass					Glass		Glass		Glass
NTC 30 kOhm	-		NTC 30 kOhm			NTC 30 kOhm		NTC 30 kOhm		NTC 30 kOhm
Spheric	Cylindric		Spheric	Cylindric		Spheric		Conic		Cylindric
KCl 3 mol/l Ag+ free	KCl 3 mol/l Ag+ free					Gel		KCl 3 mol/l Ag+ free		Referid®
Platinum wire	Ground joint					3 x Ceramic		Platinum wire		Hole
0 ... 14 pH	0 ... 14 pH			0 ... 14 pH		0 ... 14 pH		0 ... 14 pH		2 ...13 pH
0 ... 100 °C	0 ... 60 °C		-5 ... 100 °C	0 ... 60 °C		0 ... 80 °C		0...100 °C		0 ... 80 °C
<600 MΩ	< 2 GΩ	< 800 MΩ	< 600 MΩ	< 600 MΩ		< 600 MΩ		< 600 MΩ		< 400 MΩ
170 mm	170 mm			165 mm		120 mm		120 mm		120 mm
12 mm	12 mm					12 mm		12 mm		12 mm
Waterproof DIN plug + 4 mm banana plug	S7 plug head		Waterproof DIN plug + 4 mm banana plug	Waterproof digital plug	Plug head	Waterproof digital plug	Plug head	Waterproof digital plug	Plug head	Plug head
1 m fixed cable	withouth cable*		1 m fixed cable	1.5 m fixed cable	withouth cable*	1.5 m fixed cable	withouth cable*	1.5 m fixed cable	withouth cable*	withouth cable*

*=Suitable connection cables can be found on page 28

pH Lab Electrodes for Special Applications

Our lab electrodes are characterized by fast response, high precision and long service life and can also be used in difficult samples.

	Analog							Digital (IDS)	
Model	SenTix® Sp	SenTix® Sp-T	SenTix® Sur	SenTix® RJD	SenTix® Mic	SenTix® Mic-D	SenTix® Mic-B	SenTix® Micro 900	SenTix® Micro 900-P
Order-No.	103645	103733	103646	103732	103647	103660	103661	103751	103765
Type/Application	pH electrodes for penetration measurements		pH elec- trodes for surface measurem.	RJD pH electrode for polluted probes	pH electrodes for small volumes				
									
Shaft material	Glass		Glass	Glass	Glass				
Temperature sensor	-	NTC 30 kOhm	-	NTC 30 kOhm	-			NTC 30 kOhm	
Membrane shape	Spear		Flat	Calotte	Cylindric				
Reference electrolyte	Referid®		Referid®	Referid®	KCl 3 mol/l Ag+ free				
Diaphragm	Hole		Split ring	Split ring	Ceramic	Platinum wire			
Meas. range pH	2 ... 13 pH		2 ... 13 pH	2 ... 13 pH	0 ... 14 pH				
Temperature range	0 ... 80 °C		0 ... 50 °C	0 ... 80 °C	0 ... 100° C	-5 ... 100° C		0 ... 100 °C	
Membrane resistance	< 400 MΩ		< 1 GΩ	< 600 MΩ	< 700 MΩ				
Shaft length	65/25 mm		120 mm	120 mm	40/80 mm	96 mm		65/130 mm	
Shaft diameter	15/5 mm		12 mm	12 mm	12/5 mm	3 mm		12/5 mm	
Connection	S7 plug head	Waterproof DIN plug + 4 mm banana plug	S7 plug head	Waterproof DIN plug + 4 mm banana plug	S7 plug head	Waterproof DIN plug	BNC plug	Waterproof digital plug	Plug head
Cable	withouth cable*	1 m fixed cable	withouth cable*	1 m fixed cable	withouth cable*	1 m fixed cable	1 m fixed cable	1.5 m fixed cable	withouth cable*

*=Suitable connection cables can be found on page 28

ORP Electrodes

All ORP electrodes consist of a metal electrode made of precious metal and a reference electrode.

	Analog	Digital (IDS)	Analog	Digital (IDS)		Analog	Digital (IDS)
Model	SenTix® Rx	SenTix® Rx-T 900	SenTix® ORP	SenTix® ORP-T 900	SenTix® ORP-T 900-P	SenTix® Ag	SensoLyt® ORP 900-P
Order-No.	103815	103792	103648	103791	103763	103664	103749
Type/Application	ORP electrodes		ORP electrodes			Special ORP-electrode for Argentometrie	Pressure resistant ORP electrode
							
Shaft material	Plastic	Plastic	Glass	Glass	Glass	Glass	Glass
Temperature sensor	-	NTC 30 kOhm	-	NTC 30 kOhm	NTC 30 kOhm	-	NTC 30 kOhm
Membrane shape	Platinum - Pole 1mm	Platinum - Pole 1mm	Platinum - Round 4mm	Platinum - Round 4 mm	Platinum - Round 4 mm	Argentum - Cylindric cap	Platinum ring
Reference electrolyte	Gel	Gel	KCl 3 mol/l Ag+ free	KCl 3 mol/l Ag+ free	KCl 3 mol/l Ag+ free	2 mol/l KNO3 + 0,001 mol/l KCl	Polymer
Diaphragm	Fiber	Fiber	Ceramic	Ceramic	Ceramic	Ceramic	Hole
Temperature range	-5 ... 80 °C	-5 ... 80 °C	0 ... 100 °C	0 ... 100 °C	0 ... 100 °C	-5 ... 100 °C	0 ... 60 °C
Shaft length	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm
Shaft diameter	12 mm	12 mm	12 mm	12 mm	12 mm	12 mm	12 mm
Connection	S7 plug head	Waterproof digital plug	S7 plug head	Waterproof digital plug	Plug head	S7 plug head	Plug head
Cable	withouth cable*	1.5 m fixed cable	withouth cable*	1.5 m fixed cable	withouth cable*	withouth cable*	withouth cable*

Conductivity Measurement Cells

A selection of two-electrodes and four-electrodes conductivity measuring cells to cover a wide range of applications from ultrapure water to viscous samples.



	Analog								
Model	TetraCon® 325	TetraCon® 325-3	TetraCon® 325-6	TetraCon® 325-10	TetraCon® 325-15	TetraCon® 325-20	TetraCon® 325 S	TetraCon® 325/C	KLE 325
Order-No.	301960	301970	301971	301972	301973	301974	301602	301900	301995
Type/Application	Four electrodes conductivity measurement cell								Two electrodes conductivity measurement cell
									
Shaft material	Epoxy/POM							Epoxy/PEEK	Epoxy/POM
Electrode material	Graphite							PEEK	Graphite
Type	4 Electrodes								2 Electrodes
Temperature Sensor	NTC 30 kOhm								NTC 30 kOhm
Cell constant	0.475 cm ⁻¹						0.491 cm ⁻¹ ± 1.5 %	0.475 cm ⁻¹ ±1.5 %	0.84 cm ⁻¹
Maximum pressure	2 bar								2 bar
Measuring range	1 µS/cm ... 2 S/cm								10 µS/cm ... 20 mS/cm
Temperature range	-5 ... 80 °C (100 °C)**								-5 ... 80°C (100 °C)**
Min/Max Immersion depth	Min.: 36 mm Max.: Whole cell + cable up to 80 °C Only shaft (=120 mm) up to 100 °C						Min.: 40 mm Max.: Whole cell + cable up to 80 °C Only shaft (=120 mm) up to 100 °C	Min.: 36 mm Max.: Whole cell + cable	Minimal: 36 mm Maximal: Gesamte Zelle + Kabel
Shaft length	120 mm								120 mm
Shaft diameter	15,3 mm								15,3 mm
Connection	Waterproof 8-pin plug							Waterproof 8-pin plug	Waterproof 8-pin plug
Cable	1.5 m fixed cable	3 m fixed cable	6 m fixed cable	10 m fixed cable	15 m fixed cable	20 m fixed cable	1.5 m fixed cable	1.5 m fixed cable	1.5 m fixed cable

*=Suitable connection cables can be found on page 28
**=Value in brackets only shaft

Digital (IDS)						Analog		Digital (IDS)	
TetraCon® 925	TetraCon® 925 -3	TetraCon® 925 -P	TetraCon® 925 /C	TetraCon® 925/LV-P	TetraCon® 925/LV	LR 325/01	LR 325/001	LR 925/01	LR 925/01-P
301710	301711	301716	301721	301719	301718	301961	301962	301720	301722
Digital four electrodes conductivity measurement cell			Digital conductivity measurement cell for small volumes			Ultrapure water conductivity measurement cell	Trace conductivity measurement cell	Digital ultrapure water conductivity measurement cell	
Epoxy/POM		Epoxy/PEEK	Epoxy/POM	Epoxy/POM	Stainless steel/POM		Stainless steel/POM		
Graphite			Graphit	Graphite	POM	Stainless steel	Graphite		
4 Electrodes			4 Electrodes	4 Electrodes	2 Electrodes		2 Electrodes		
NTC 30 kOhm						NTC 30 kOhm		NTC 30 kOhm	
0.475 cm ⁻¹			0.469 cm ⁻¹	0.469 cm ⁻¹	0.1 cm ⁻¹	0.01 cm ⁻¹	0.100 cm ⁻¹ ± 2 %		
Cable connection: 2 bar, plug head: 10 bar						2 bar		2 bar	
1 µS/cm 2000 mS/cm						0.001 µS/cm ... 200 µS/cm	0.0001 µS/cm ... 30 µS/cm	0.01 µS/cm ... 200 µS/cm	
-5 ... 70° C (100 °C)**						-5 °C ... 80 °C (100 °C)		-5 ... 70 °C (100 °C)	
Min.: 36 mm Max.: Whole cell + cable			Min.: 16 mm Max.: Whole cell + cable			Min.: 30 mm Max.: Whole cell + cable	Min.: 40 mm (Immersion cell) Max.: Whole cell + cable	Min.: 30 mm Max.: Whole cell + cable up to 70 °C Only shaft (=120 mm) up to 100 °C	
120 mm						120 mm		120 mm	
15,3 mm						12 mm		12 mm	
Waterproof digital plug		Plug head	Waterproof digital plug	Plug head	Waterproof digital plug	Waterproof 8-pin plug		Waterproof digital plug	Plug head
1.5 m fixed cable	3 m fixed cable	withouth cable*	1.5 m fixed cable	withouth cable*	1.5 m fixed cable	1.5 m fixed cable		1.5 m fixed cable	withouth cable*

Oxygen Sensors

Optical measurement is the most modern method of determining dissolved oxygen. The so-called fluorescence quenching is used, which means that the fluorescence signal of suitable dyes changes according to the law depending on the oxygen concentration and is converted accordingly.



	Analog			
Model	CellOx® 325	CellOx® 325-3	CellOx® 325-6	DurOx® 325-3
Order-No.	201533	201545	201546	201570
Type/Application	Universal galvanic dissolved oxygen sensors			Galvanic oxygen sensor for the field
				
Shaft material	POM			POM
Temperature sensor	NTC 30 kOhm			NTC 30 kOhm
Sensor head	Epoxy, PEEK			Epoxy, PEEK
Measuring range at 20 °C	0 ... 50 mg/l O2 concentration 0 ... 600 % O2 saturation 0 ... 1250 mbar O2 partial pressure			0 ... 50 mg/l O2 concentration 0 ... 600 % O2 saturation 0 ... 1250 mbar O2 partial pressure
Max. permissible overpressure	6·10 ⁵ Pa (6 bar)			-
Temperature range	0 ... 50 °C			0 ... 40 °C
Min/Max Immersion depth	min. 6 cm / max. 20 m (depending on cable length)			min. 4 cm / max. 6 m (depending on cable length)
Shaft length	145 mm			110 mm
Shaft diameter	15.25 mm			17.5 mm
Connection	Waterproof 8-pin plug			Waterproof 8-pin plug
Cable	1.5 m fixed cable	3 m fixed cable	6 m fixed cable	3 m fixed cable

Analog	Digital (IDS)		
StirrOx®G 201425	FDO® 925 201300	FDO® 925-3 201301	FDO® 925-P 201306
Self-stirring dissolved oxygen sensor	Digital optical dissolved oxygen sensor		
			
POM	POM		
NTC 30 kOhm	NTC 30 kOhm		
Epoxy, PEEK	POM, Stainless steel		
0 ... 50 mg/l O2 concentration 0 ... 600 % O2 saturation 0 ... 1250 mbar O2 partial pressure	0 ... 20 mg/l O2 concentration 0 ... 200 % O2 saturation 0 ... 400 mbar O2 partial pressure		
corresponding to an immersion measurement up to the maximum immersion depth	1 x 10 ⁶ Pa (10 bar)		
0 ... 50 °C	0 ... 50 °C		
min. 49 mm / max. 83 mm (with stirring paddle)	min 6 cm / max. 100 m (depending on cable length)		
83 mm	150 mm		
12 mm - 43 mm	15.3 mm		
Waterproof 8-pin plug, Western plug	Waterproof digital plug		Plug head
1.5 m fixed cable	1.5 m fixed cable	3 m fixed cable	without cable*

*=Suitable connection cables can be found on page 28

Ion-Selective Electrodes

Combined ISE and GSE electrodes

Ion-selective and gas-sensitive electrodes are used to measure 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 into the respective measurement result.



	Analog					
Model	NH 500/2	Na 800/S7	Ag/S 800 DIN	Br 800 DIN	Ca 800 DIN	Cl 800 DIN
Order-No.	106395	106649	106651	106653	106655	106661
Ions/gases	Ammonia gases	Sodium	Silver / Sulfide	Bromide	Calcium	Chloride
						
Measuring range	10 ⁻⁶ ... 5 · 10 ⁻² mol/l NH ₄ ⁺ 0.02 ... 900 mg/l NH ₄ ⁺	10 ⁻⁶ ... 1 mol/l Na ⁺ 0.01...23000 mg/l Na ⁺	0.01 ... 108000 mg/l Ag ⁺ 0.003 ... 32000 mg/l S ²⁻	0.4 ... 79000 mg/l Br	0.02 ... 40000 mg/l Ca ²⁺	2 ... 35000 mg/l Cl ⁻
Reference electrolyte	-	3 mol/l KCl	-			
Diaphragm	-	Platinum wire	-			
pH range	4 ... 12	8 ... 11	2 ... 12	1 ... 12	2.5 ... 11	2 ... 12
Temperature range	0 ... 50 °C	-10 ... +80 °C	0 ... 80 °C	0 ... 80 °C	0 ... 40 °C	0 ... 80 °C
Membrane resistance	-	< 500 MΩ	< 1 MΩ	< 0.1 MΩ	1 bis 4 MΩ	< 1 MΩ
Membrane	-	Glass electrode	Solid state electrode	Solid state electrode	Matrix electrode	Solid state electrode
Immersion depth	Min.: 5 mm, Max.: 50 mm	Min.: 20 mm, Max.: 100 mm	Min.: 20 mm, Max.: 80 mm			
Shaft length	120 mm					
Shaft diameter	12 mm					
Add. scope of delivery	3 exchange heads, 50 ml electrolyte solution	-	Electrolyte	Electrolyte	Electrolyte and exchange head	Electrolyte
Connection	S7 plug head		Waterproof DIN plug			
Cable	without cable*		1 m fixed cable			

Analog					
CN 800 DIN 106663	Cu 800 DIN 106665	F 800 BNC 106666	F 800 DIN 106667	K 800 DIN 106671	NO 800 DIN 106675
Cyanide	Copper	Fluoride	Fluoride	Potassium	Nitrate
					
0.2 ... 260 mg/l CN ⁻ (recommended 0.2 ... 25 mg/l CN ⁻) 8 x 10 ⁻⁶ ... 1 x 10 ⁻² mol/l CN ⁻ (recommended 8 x 10 ⁻⁶ ... 1 x 10 ⁻³ mol/l CN ⁻)	6 x 10 ⁻⁴ ... 6350 mg/l Cu ²⁺	0.02 mg/l F ⁻ (10 ⁻⁶ mol/l) until saturation	0.02 mg/l F ⁻ (10 ⁻⁶ mol/l) until saturation	0.04 ... 39000 mg/l K ⁺	0.4 ... 62000 mg/l NO ₃ ⁻
-					
-					
0 ... 14	2 ... 6	5 ... 7		2 ... 12	2.5 ... 11
0 ... 80 °C				0 ... 40 °C	
< 30 MΩ	< 1 MΩ	0.15 ... 0.2 MΩ	0.15 ... 0.2 MΩ	< 50 MΩ	1 bis 5 MΩ
Solid state electrode	Solid state electrode	Solid state electrode	Solid state electrode	Matrix electrode	Matrix electrode
Min.: 20 mm, Max.: 80 mm					
120 mm					
12 mm					
Electrolyte				Electrolyte and exchange head	Electrolyte and exchange head
Waterproof DIN plug		BNC plug	Waterproof DIN plug		
1 m fixed cable					

*=Suitable connection cables can be found on page 28

pH Electrodes Guide - Applications

SenTix®		Field					Lab										
		2x	4x / 940	5x / 950	Top	Sp-T	6x	8x / 980	9x	H	HWx	Micx	Spx	Sur	RJD	945	Sensolyt® 900 P
Application																	
Chemistry	Diluted acids						●	●	●		○					●	
	Diluted alkalis									●							
	Emulsions, water-based						●	●	●	●	●					●	●
	Non-aqueous liquids									○	○						
	Oil/water emulsions				●		●	●	●	●	●				●	●	●
	Sulfide-containing liquids				●						●				●		
Industry	Boiler feed water						○	○	○		●					○	
	Cooling water						●	●	●		●					●	
	Cutting oil emulsions				●										●		●
	Dye solutions						●	●	●		●					●	
	Galvanic wastewater	●	●	○	●		○	○	○		○						
	Galvanic baths				●		●	●	●		○				●	●	
Water	Waste water	●	●	○	●		○	○	○							○	●
	Paper extract						●	●	●								
	Aquarium water	●	●	●	●		○	○	○								
	Condensate										●						
	Distilled water										●						
	Fully desalinated water										●						
Field Measurements	Saline solutions	○	○	○	○		●	●	●	○	●					●	●
	Suspensions				●						●				●		●
	Swimming pool water	●	●	●	●		●	●	●							●	
	Waster water, general	●	●	○	●		○	○	○							○	●
	Drinking water	○	○	●	○		●	●	●		○					●	
	Groundwater	●	●	○	●		○	○								○	●
Cosmetics / Cleaning	Lake water	○	○	○	○		●	●	●		●					●	●
	Rain water						○	○	○		●					○	
	Sea water						○	○	○	○	●					○	
	Soil extract						●	●	●		●					●	
	Surface water	●	●	●	●		●	●	●		○					●	●
	Hair color				●		●	●	●		●					●	
	Hair gel					●							●	●			
	Lotions / Creams				●	●							●	●	●		●
	Make-up					●							●	●			
	Mouthwash						●	●	●		●					●	
	Shampoo				●						●				●		●
	Toothpaste				●	●							●		●		●
	Household cleaners	○	○	○	○		●	●	●	●	○					●	●

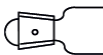
● recommended for this application ○ applicable for this application

SenTix®		Field					Lab										
		2x	4x / 940	5x / 950	Top	Sp-T	6x	8x / 980	9x	H	HWx	Micx	Spx	Sur	RJD	945	Sensolyt® 900 P
Application																	
Paints	Bleach			○			○	○	○	●	○					○	
	Dispersion paints				●										●		●
	Paints & varnishes, water-soluble				●		○	○	○		○				●	○	●
Solids / Surfaces	Leather (Surface)													●			
	Paper													●			
	Skin (Surface)													●			
	Solids (Penetration)					●							●				
Beverages	Solids (Surface)													●			
	Beer			○			●	●			●					●	
	Lemonade			●			●	●	●		○					●	
	Sparkling Water	○	○	●	○		●	●	●		○					●	
	Fruit juice			●			●	●	●		○					●	
	Vegetable juice			○			●	●	●		○					●	
Food	Wine			○			●	●	●		●					●	
	Milk						●	●	●		●					●	
	Bread					●								●			
	Coffee extract			○			●	●	●		●					●	
	Fish					●								●			
	Honey				○						●				○		
	Marmalade				○						●				○		
	Butter / margarine					●								●	●		
	Mayonnaise				●	●								●		●	
	Meat					●								●			
	Sausage					●								●			
	Vinegar				●			●	●		●					●	
Pharma, Biology, Medicine	Fruits / vegetabels					●								●			
	Cheese					●								●			
	Yogurt					●	○	○	○		●			●		○	
	Agar-agar gel													●			
	Bacterial cultures													●			
	Enzyme solutions						●	●	●		●					●	
	Gastric juice						●	●	●		●					●	
	Infusion solutions						●	●	●		●					●	
	Protein-containing liquids						●	●	●		●	●				●	
	Saliva											○			●		
	Serum						●	●	●		●					●	
	Tris buffer solutions						●	●	●		●					●	
	Urine						●	●	●		●					●	
	Vials											●					

pH Electrodes Guide - Membranes

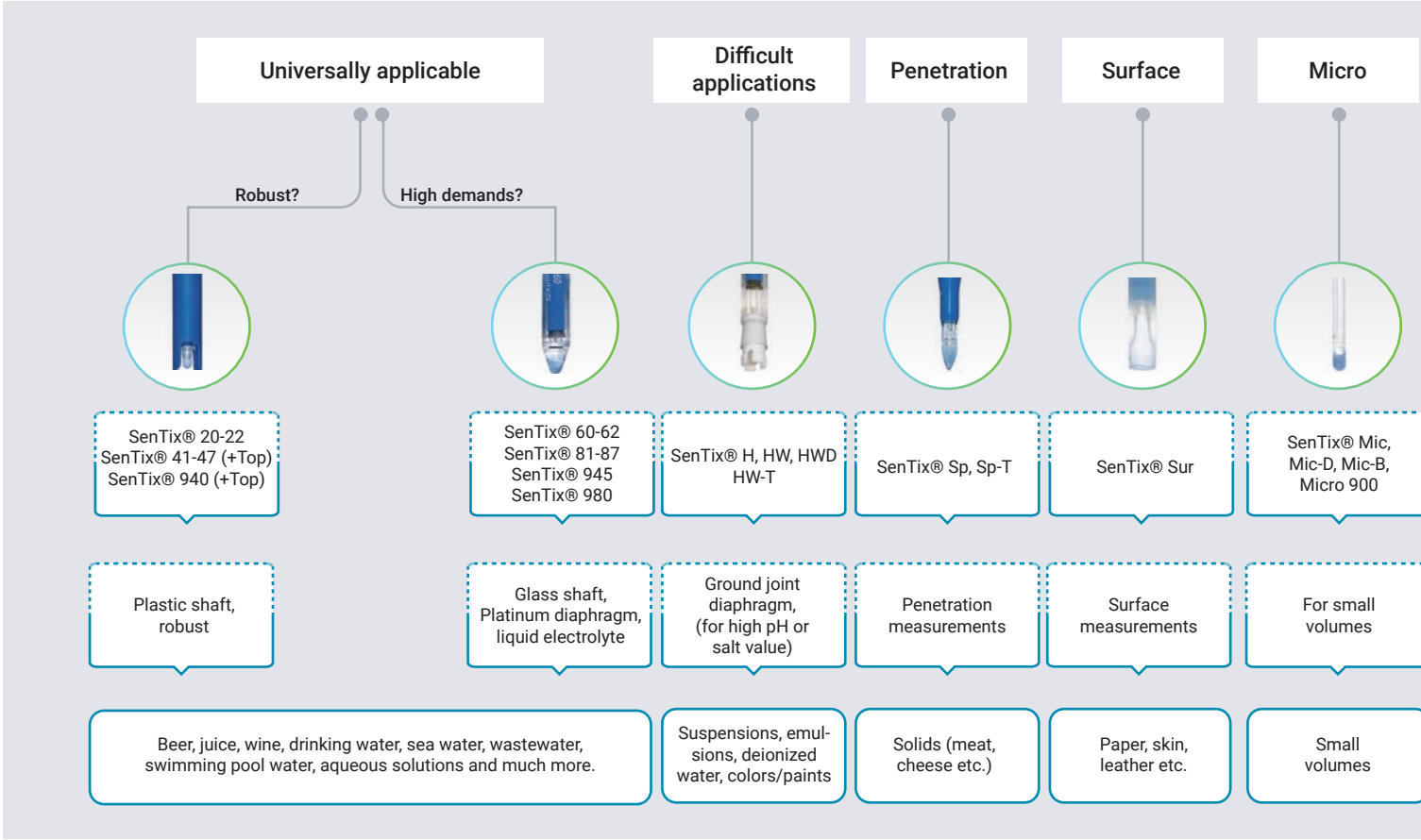
Head	Shape	Application
	Sphere	Constant quality, low resistance due to large surface area, suitable for most applications
	Cone	Shockproof , easy to clean
	Calotte	Easily wetted , shockproof, easy to clean
	Cylindric	Shockproof , for general applications
	Spear	Shockproof, for penetration of semi-solid samples
	Flat	Shockproof, easy to clean, primarily for measurements on surfaces
	Micro	Measurement in small volumes , suitable for general applications

pH Electrodes Guides - Diaphragms

	Type	Resistance	Outflow	Application
	Ceramic	1 kOhm	up to 0.2 ml/d	General purpose, robust
	Platinum	0.5 kOhm	up to 1 ml/d	Universally applicable, quick adjustment, constant, insensitive to pollution
	Ground joint	0.2 kOhm	up to 3 ml/d	Suitable for emulsions, ultrapure water, easy to clean
	Split ring + Hole	0.1 kOhm	-	Symmetrical, easy to handle, insensitive to pollution , suitable for wastewater, suspensions

	Fibre	1 kOhm	-	Quick adjustment, easy handling
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pH Electrodes Guide - Selection Guide



Do you have questions about choosing the right electrode for your application?

We will be glad to help you:

<https://www.xylenanalytics.com/en/contact/consult-your-expert>



pH Electrodes - Blog

In our blog you can regularly read current and exciting articles on the topic of "pH". Our experts will give you tips on calibration, selecting pH electrodes or how to care for and store pH electrodes.

Just subscribe to our blog and don't miss out none of our articles:

<https://www.xylenanalytics.com/en/company/blog>



Sensors - Accessories

Standard Buffers

	Name	Art.-No.	Description
	PL 2 (pH 1.679 /1.68) PL 4 (pH 4.006 /4.01) PL 7 (pH 6.865 /6.87) PL 9 (pH 9.180 /9.18) PL 12 (pH 12.47)	109000 109110 109120 109130 109400	Standard (DIN/NIST) buffer solution for special applications 1 x 250 ml
	SORT/K	109415	Calibration and maintenance set with standard (DIN/NIST) buffer solution: 3 bottles with 250 ml each: pH 4.006 - 6.865 - 9.180 1 bottle with 250 ml pepsin cleaning solution 1 bottle with 250 ml KCl solution 3 mol/l
	STAPL-4/7/9	109020	Working reference buffer solution 10 x 6 glass ampoules with 20 ml each: pH 4.01, pH 6.87, pH 9.18 (Traceable to NIST/PTB. Steam-sterilized package)
	QSC Kit	109830	Initial calibration kit for IDS pH electrodes: 3 ampoules pH 4.01; pH 6.86; pH 9.18

KCl, Cleaning and References

	Name	Art.-No.	Description
	PEP/pH (3x250ml)	109648	Pepsin cleaning solution (<i>only for electrodes with liquid electrolytes</i>), to remove protein-containing contamination from the diaphragm, 3 x 250 ml
	KCl-50	109706	KCl solution, 3 mol/l, 1 x 50 ml
	KCl-250	109705	KCl solution, 3 mol/l, 1 x 250 ml
	ELY/ORP/Ag	109735	Electrolyte with 2 mol/l KNO3 + 0.001 mol/l KCl (<i>for combined Ag-electrode</i>), 1 x 250 ml

	RH 28	109740	ORP buffer solution pH 7, $U_H = 427$ mV, 1 x 250 ml
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Storage

	Name	Art.-No.	Description
	Z 453	285123170	Plastic container with compression ring seal and bayonet lock for electrodes with a diameter of 12 mm

Technical Buffer Solutions

	Name	Art.-No.	Description
	STP 4 (pH 4.01) STP 7 (pH 7.00) STP 10 Trace (pH 10.01)	108706 108708 108722	Technical buffer solution, 1 x 50 ml
	TPL 4 (pH 4.01) TPL 7 (pH 7.00) TPL 10 Trace (pH 10.01)	108800 108802 108805	Technical buffer solution, 1 x 250 ml
	TPL 4/10 (pH 4.01) TPL 7/10 (pH 7.00) TPL 10 Trace/10 (pH 10.01)	108801 108803 108809	Technical buffer solution, 10 x 250 ml
	TPL 4/25 (pH 4.01) TPL 7/25 (pH 7.00) TPL 10 Trace/25 (pH 10.01)	108811 108812 108814	Technical buffer solution, 25 x 250 ml
	TEP 2 (pH 2.00) TEP 4 (pH 4.01) TEP 7 (pH 7.00) TEP 10 Trace (pH 10.01)	108698 108700 108702 108703	Technical buffer solution, 1 x 1 Liter
	TEP 4/10 (pH 4.01) TEP 7/10 (pH 7.00) TEP 10 Trace/10 (pH 10.01)	108701 108725 108727	Technical buffer solution, 10 x 1 Liter
	TEP 4/25 (pH 4.01) TEP 7/25 (pH 7.00) TEP 10 Trace/25 (pH 10.01)	108728 108729 108731	Technical buffer solution, 25 x 1 Liter
	SORT/TPL/TRACE	108824	Calibration and maintenance set technical buffer solution: 3 bottles with 250 ml each: pH 4.01/7.00/10.01 Trace 1 bottle with 250 ml KCl solution 3 mol/l 1 bottle with 250 ml pepsin cleaning solution
	SORT/TPL/G/TRACE	108825	Calibration and maintenance set technical buffer solution (Gel electrodes): 3 bottles with 250 ml each: pH 4.01/7.0/10.01 Trace 2 bottles with 250 ml each: KCl solution 3 mol/l
	SORT/TEP/TRACE	108826	Calibration and maintenance set technical buffer solution: 3 bottles with 1 l each: pH 4.01/7.0/10.01 Trace 1 bottle with 250 ml: pepsin cleaning solution 1 bottle with 250 ml KCl solution 3 mol/l
	SORT/TEP/G/TRACE	108827	Calibration and maintenance set technical buffer solution (Gel electrodes): 3 bottles with 1 l each: pH 4.01/7.0/10.01 Trace 2 bottles with 250 ml each: KCl-Lösung 3 mol/l

Conductivity Standard

	Name	Art.-No.	Description
	E-SET Trace	300572	Calibration set for conductivity measurement 6 bottles with 50 ml each: calibration and control standard, KCl 0.01 mol/l, 1413 μS/cm bei 25 °C (traceable to PTB/NIST)

Sensors - Accessories

Cable & Plugs

	Name	Art.-No.	Description
	AS/DIN AS/DIN - 3	108110 (1m) 108112 (3m)	Connection cable with DIN plug (for pH/ORP electrodes with plug head)
	AS/BNC	108114	Connection cable with BNC plug (for pH/ORP electrodes with plug head) 1 m cable
	ADA-DIN-BNC	108509	Adapter for connecting pH electrodes with BNC plug to a meter with DIN socket
	IDS WLM-S	108141	Wireless module for IDS plug head sensors for radio transmission of measurement values. Includes rechargeable LiPo-battery. Splash water protected according IP 66.
	IDS WLM-M	108142	Wireless module for connecting to MultiLine® 3310/3510/36x0 IDS and inoLab® Multi IDS. Connects up to three sensors at the same time (depends on meter capabilities). Also for operation of OxiTop®-IDS.
	WLM Charger	108143	Charger without external power supply for charging IDS WLM-S modules, with USB plug, cascable, with USB cable. For charging via PC or external USB power supply.
	IDS WLM Kit	108144	Kit consisting of one of each IDS WLM-S, IDS WLM-M and WLM Charger including USB power supply for wireless operation of IDS plug head sensors.
	AS/IDS-1.5 AS/IDS-3 AS/IDS-6 AS/IDS-10 AS/IDS-15 AS/IDS-20 AS/IDS-25 AS/IDS-40 AS/IDS-60 AS/IDS-100	903850 (1.5m) 903851 (3m) 903852 (6m) 903853 (10m) 903854 (15m) 903855 (20m) 903856 (25m) 903857 (40m) 903858 (60m) 903859 (100m)	Connection cable for MPP IDS respectively IDS sensors with waterproof plug head
	ADA S7/IDS	108130	Adapter cable 1.5 m with digital connector, for connecting a SenTix® combination electrode with S7 plug head to a MultiLine® or inoLab® IDS.

Flow-through Vessel

	Name	Art.-No.	Description
	D 3Sen	903842	Flow-through vessel for up to three pH, ORP, D.O. or conductivity sensors (also IDS). With tube adapter for commercially available garden hoses inner diameter 19 mm (3/4"). Including clamp also for mast mounting.

Case Sets

	Name	Art.-No.	Description
	KS Universal	2F0001	Universal Case set for all analog and digital handhelds (<i>without meter and sensors</i>) incl. • Armoring SM Pro • Buffer STP 4 und STP 7 • Stand & beaker • Conductivity standard 1413 µS/cm at 25° C
	KS MultiLine® 2	2F0004	Case set for MultiLine® multiparameter systems with 3 IDS sensors (large field case) (<i>without meter and sensors</i>) incl.: • Armoring SM Pro • Buffer STP 4 and STP 7 • Stand & beaker • Conductivity standard 1413 µS/cm at 25° C

Armoring

	Name	Art.-No.	Description
	A pHLab/K	903841	Plastic armoring for protecting pH and ORP electrodes with length 120 mm in the field and in a plant
	A 325/K	903830	Plastic armoring with protective hood for oxygen sensor CellOx® 325 and conductivity cell TetraCon® 325
	A 925/K	903836	Armor for IDS field sensors including guard, suitable for TetraCon® 925, SensoLyt® 900, FDO® 925, material: POM .
	A 925-P/K	903839	Armor for IDS field sensors including guard designed for TetraCon® 925-P, SensoLyt® 900-P, SensoLyt® ORP 900-P, FDO® 925-P, VisoTurb® 900-P, material: POM .
	A 925-P/S	903840	Armor for IDS field sensors including guard designed for TetraCon® 925-P, SensoLyt® 900-P, SensoLyt® ORP 900-P, FDO® 925-P, material: Stainless steel .

Stands

	Name	Art.-No.	Description
	STH 650	109809	Benchtop stand for pH electrodes, ion-sensitive electrodes, reference electrodes, temp sensors, oxygen sensors and TetraCon® 325 cond cells
	STH 9400	109813	Stand including electrode holder for right or left mounting, for inoLab 94x0

Your Partner for measuring devices and sensors

Our service for you

Do you know our **services** for your electrochemical and optical measuring devices and sensors?

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- Validations according to IQOQPQ (only for laboratory devices)
- Device verification
- Calibration

Service is not just software, hotline, calibration service, rental equipment and repairs, but for us this means also “service **to the customer**”. We work closely with you to find your optimal solution. By watching and listening carefully, your problem can be properly understood and effective solutions are implemented.

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Your advantages

- You are on the safe side! Your **sensors** have been checked by the manufacturer and given a **test seal**. This ensures that all parts are functional and that your **measured values are correct** when used correctly.
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- We have a large selection of different sensors and can test them on site and check whether you are using the **ideal electrodes and testing equipment for your samples**.

Measuring devices from Xylem Analytics

For your daily work, whether in the lab or in the field, you will find both precise laboratory measuring devices and robust portable measuring systems. Please feel free to arrange a conversation for advice or find your optimal measuring device on our website.



Diverse parameters

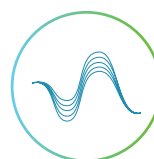
We are your partner for a wide variety of parameters that are measured in laboratories:



pH



Multiparameter



Photometry



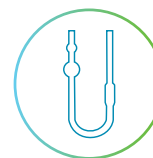
Temperature



Titration



Refractometry



Viscometry

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<https://www.xylemanalytics.com/en/company/blog/handbooks>



Xylem | 'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

Xylem (XYL) is a Fortune 500 global water solutions company that empowers customers and communities to build a more water-secure world. Our 23,000 diverse employees delivered combined pro forma revenue of \$8.1 billion in 2023, optimizing water and resource management with innovation and expertise.

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