



Sensors for Field & Lab

ALWAYS THE RIGHT CHOICE

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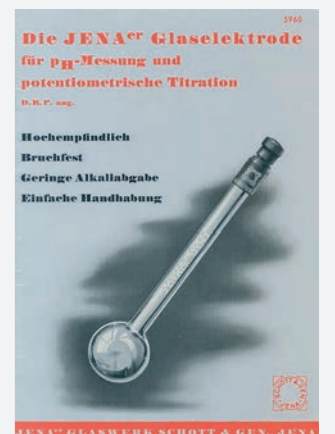
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Sensors for Field & Lab



Our know-how

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 - 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.

Elektrolytes:

The electrolyte is connected to the sample via the diaphragm. **Potassium chloride (KCl)** is the most commonly used electrolyte and can be of a liquid, gel, or polymer form.

Refill opening:

Since the electrolyte leaks through the diaphragm, electrodes with liquid electrolyte must be **refilled**.

Reference electrode:

The reference electrode generates a **constant electrical potential**. The difference in the electrical potential between the reference and measuring electrode results in a voltage that is used to calculate the pH value.

Measuring electrode:

The measuring electrode consists of a **capillary tube** filled with a buffer solution with a **pH-sensitive glass** at the tip. Inside there is also a conductive element for potential detection, the so-called internal reference.

Glass membrane:

The membrane can vary in shape and is made of special glass that is **sensitive to hydrogen ion activity**. It is filled with a buffer with a known pH value, while the sample on the outside has variable hydrogen ion activity. This difference creates an electrical potential.

Diaphragm:

The diaphragm allows **electrical contact** between the reference electrode and the solution. The diaphragm is only slightly permeable so that the electrolyte cannot escape too quickly.

Internal buffer:

The inner buffer is the **filling of the measuring electrode** and wets the membrane glass from the inside. Here is usually a small air bubble that is used to compensate the expansion during measurements at elevated temperatures.

Temperature sensor (optional):

Some electrodes have an integrated temperature sensor. pH values are **temperature dependent**. Therefore, pH measurements should always be carried out with an accurate temperature sensor.



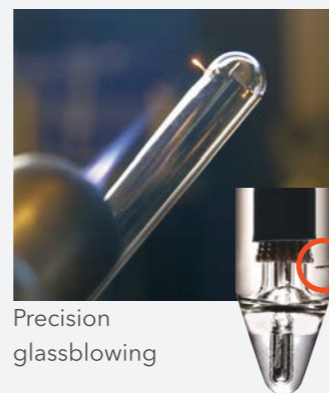
pH Electrodes

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 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.



Model	Analog				Analog							Analog			Digital (IDS)		Digital (IDS)		Digital (IDS)			Digital (IDS)			
	SenTix® 20	SenTix® 21	SenTix® 21-3	SenTix® 22	SenTix® 41	SenTix® 41-3	SenTix® 42	SenTix® 43	SenTix® 44	SenTix® 46	SenTix® 47	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	
Order-No.	103630	103631	103632	103633	103635	103636	103637	103805	103806	103807	103808	103651	103652	103809	103816	103817	103744	103752	103766	103740	103741	103760	103750	103761	
Type/Application	Low-maintenance pH electrodes without temperature sensor				Low-maintenance pH electrodes with temperature sensor							pH electrodes with temperature sensor			pH electrodes with double reference system and polymer electrolyte		Digital pH penetraton electrodes		Digital low-maintenance pH electrodes			Digital pH electrodes			
Image																									
Shaft material	Plastic				Plastic							Plastic			PEEK Shaft / Plastic		Plastic		Plastic			Plastic			
Temperature sensor	-				NTC 30 kOhm		Pt 1000		NTC 30 kOhm		NTC 10 kOhm		NTC 30 kOhm		NTC 10 kOhm		NTC 30 kOhm		NTC 30 kOhm		NTC 30 kOhm			NTC 30 kOhm	
Membrane shape	Cylindric				Cylindric							Cylindric			Cylindric		Spear		Cylindric			Cylindric			
Reference electrolyte	Gel				Gel							KCl 3 mol/l Ag+ free			Duralid®		Referid®		Gel			KCl 3 mol/l Ag+ free			
Diaphragm	Fiber				Fiber							Ceramic			Double junction / hole		Hole		Fiber			Ceramic			
Meas. range pH	0 ... 14 pH				0 ... 14 pH							0 ... 14 pH			0 ... 14 pH		2 ... 13 pH		0 ... 14 pH			0 ... 14 pH			
Temperature range	0 ... 80 °C				0 ... 80 °C							0 ... 80 °C			0 ... 80 °C		-5 ... 100 °C		0 ... 80 °C		0 ... 80 °C			0 ... 80 °C	
Membrane resistance	< 1 GΩ				< 1 GΩ							< 1 GΩ			< 400 MΩ		< 400 MΩ		< 1 GΩ			< 1 GΩ			
Shaft length	120 mm				120 mm							120 mm			120 mm		120 mm		65/25 mm		120 mm			120 mm	
Shaft diameter	12 mm				12 mm							12 mm			12 mm		12 mm		15/5 mm		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)	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		
Cable	without 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					1 m fixed cable			1 m fixed cable		1.5 m fixed cable	1.5 m fixed cable	without cable*	1.5 m fixed cable	3 m fixed cable	without cable*	1.5 m fixed cable	without cable*	

*=Suitable connection cables can be found on page 28

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



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.



Model	Analog			Analog							Analog	Analog			Digital (IDS)		Digital (IDS)		Digital (IDS)		Digital (IDS)	
	SenTix® 60	SenTix® 61	SenTix® 62	SenTix® 81	SenTix® 82	SenTix® 83	SenTix® 84	SenTix® 85	SenTix® 86	SenTix® 87	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	
Order-No.	103639	103640	103641	103642	103643	103810	103811	103812	103813	103814	103695	103644	103650	103731	103753	103767	103743	103764	103780	103762	103748	
Type/Application	Precision pH electrodes without temperature sensor			Precision pH electrodes with temperature sensor							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	
Shaft material	Glass			Glass							Glass	Glass					Glass		Glass		Glass	
Temperature sensor	-			NTC 30 kOhm			Pt 1000		NTC 30 kOhm	NTC 10 kOhm	NTC 30 kOhm	-					NTC 30 kOhm		NTC 30 kOhm		NTC 30 kOhm	
Membrane shape	Conic			Conic							Spheric	Cylindric		Spheric	Cylindric		Spheric		Conic		Cylindric	
Reference electrolyte	KCl 3 mol/l Ag+ free			KCl 3 mol/l Ag+ free							KCl 3 mol/l Ag+ free	KCl 3 mol/l Ag+ free					Gel		KCl 3 mol/l Ag+ free		Referid®	
Diaphragm	Platinum wire			Platinum wire							Platinum wire	Ground joint					3 x Ceramic		Platinum wire		Hole	
Meas. range pH	0 ... 14 pH			0 ... 14 pH							0 ... 14 pH	0 ... 14 pH		0 ... 14 pH		0 ... 14 pH		0 ... 14 pH		0 ... 14 pH		2 ... 13 pH
Temperature range	0 ... 100 °C			0 ... 100 °C							0 ... 100 °C	0 ... 60 °C		-5 ... 100 °C		0 ... 60 °C		0 ... 80 °C		0 ... 100 °C		0 ... 80 °C
Membrane resistance	<600 MΩ			<600 MΩ							<600 MΩ	< 2 GΩ	< 800 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 600 MΩ	< 400 MΩ	
Shaft length	120 mm			120 mm							170 mm	170 mm					165 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 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)	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	Waterproof digital plug	Plug head	
Cable	without cable*	1 m fixed cable		1 m fixed cable							1 m fixed cable	without cable*	1 m fixed cable	1.5 m fixed cable	without cable*	1.5 m fixed cable	without cable*	1.5 m fixed cable	without cable*	without cable*		

*=Suitable connection cables can be found on page 28

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



N 6480 ETH

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.

Model	Analog		Analog	Analog	Analog			Digital (IDS)	
	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 electrodes for surface measurements	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	without cable*	1 m fixed cable	without cable*	1 m fixed cable	without cable*	1 m fixed cable	1 m fixed cable	1.5 m fixed cable	without 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.



Model	Analog	Digital (IDS)	Analog	Digital (IDS)		Analog	Digital (IDS)
	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	without cable*	1.5 m fixed cable	without cable*	1.5 m fixed cable	without cable*	without cable*	without 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.








Model	Analog								Analog	Digital (IDS)						Analog		Digital (IDS)						
	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	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					
Order-No.	301960	301970	301971	301972	301973	301974	301602	301900	301995	301710	301711	301716	301721	301719	301718	301961	301962	301720	301722					
Type/Application	Four electrodes conductivity measurement cell								Two electrodes conductivity measurement cell	Digital four electrodes conductivity measurement cell						Ultrapure water conductivity measurement cell	Trace conductivity measurement cell	Digital ultrapure water conductivity measurement cell						
Shaft-/Head material	Epoxy/POM								Epoxy/POM	Epoxy/PEEK	Epoxy/POM	Epoxy/POM						Epoxy/PEEK	Epoxy/POM	Epoxy/POM	Stainless steel/POM		Stainless steel/POM	
Electrode material	Graphite								Graphite	PEEK	Graphite	Graphite						Graphite	Graphite	POM	Stainless steel	Graphite		
Type	4 Electrodes								2 Electrodes	4 Electrodes						4 Electrodes	4 Electrodes	2 Electrodes		2 Electrodes				
Temperature sensor	NTC 30 kOhm								NTC 30 kOhm		NTC 30 kOhm	NTC 30 kOhm						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	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 %		
Maximum pressure	2 bar								2 bar		2 bar	Cable connection: 2 bar, plug head: 10 bar						2 bar		2 bar				
Measuring range	1 µS/cm ... 2 S/cm								1 µS/cm ... 2 S/cm		10 µS/cm ... 20 mS/cm	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				
Temperature range	-5 ... 80 °C (100 °C)**								-5 ... 80 °C (100 °C)**		-5 ... 80 °C (100 °C)**	-5 ... 70 °C (100 °C)**						-5 °C ... 80 °C (100 °C)		-5 ... 70 °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	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		
Shaft length	120 mm								120 mm		120 mm	120 mm						120 mm		120 mm				
Shaft diameter	15.3 mm								15.3 mm		15.3 mm	15.3 mm						12 mm		12 mm				
Connection	Waterproof 8-pin plug								Waterproof 8-pin plug		Waterproof 8-pin plug	Waterproof digital plug		Plug head	Waterproof digital plug	Plug head	Waterproof digital plug	Waterproof 8-pin plug		Waterproof digital plug	Plug head			
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	3 m fixed cable	without cable*	1.5 m fixed cable	without cable*	1.5 m fixed cable	1.5 m fixed cable		1.5 m fixed cable	without cable*					

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

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			Analog	Analog	Digital (IDS)		
Model	CellOx® 325	CellOx® 325-3	CellOx® 325-6	DurOx® 325-3	StirrOx® G	FDO® 925	FDO® 925-3	FDO® 925-P
Order-No.	201533	201545	201546	201570	201425	201300	201301	201306
Type/Application	Universal galvanic dissolved oxygen sensors			Galvanic oxygen sensor for the field	Self-stirring dissolved oxygen sensor	Digital optical dissolved oxygen sensor		
								
Shaft material	POM			POM	POM	POM		
Temperature sensor	NTC 30 kOhm			NTC 30 kOhm	NTC 30 kOhm	NTC 30 kOhm		
Sensor head	Epoxy, PEEK			Epoxy, PEEK	Epoxy, PEEK	POM, Stainless steel		
Measuring range at 20 °C	0 ... 50 mg/l O ₂ concentration 0 ... 600 % O ₂ saturation 0 ... 1250 mbar O ₂ partial pressure			0 ... 50 mg/l O ₂ concentration 0 ... 600 % O ₂ saturation 0 ... 1250 mbar O ₂ partial pressure	0 ... 50 mg/l O ₂ concentration 0 ... 600 % O ₂ saturation 0 ... 1250 mbar O ₂ partial pressure	0 ... 20 mg/l O ₂ concentration 0 ... 200 % O ₂ saturation 0 ... 400 mbar O ₂ partial pressure		
Max. permissible overpressure	6-10 ⁵ Pa (6 bar)			-	corresponding to an immersion measurement up to the maximum immersion depth	1 x 10 ⁶ Pa (10 bar)		
Temperature range	0 ... 50 °C			0 ... 40 °C	0 ... 50 °C	0 ... 50 °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)	min. 49 mm / max. 83 mm (with stirring paddle)	min 6 cm / max. 100 m (depending on cable length)		
Shaft length	145 mm			110 mm	83 mm	150 mm		
Shaft diameter	15.25 mm			17.5 mm	12 mm - 43 mm	15.3 mm		
Connection	Waterproof 8-pin plug			Waterproof 8-pin plug	Waterproof 8-pin plug, Western plug	Waterproof digital plug		Plug head
Cable	1.5 m fixed cable	3 m fixed cable	6 m fixed cable	3 m fixed cable	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.



Model	Analog						Analog					
	NH 500/2	Na 800/S7	Ag/S 800 DIN	Br 800 DIN	Ca 800 DIN	Cl 800 DIN	CN 800 DIN	Cu 800 DIN	F 800 BNC	F 800 DIN	K 800 DIN	NO 800 DIN
Order-No.	106395	106649	106651	106653	106655	106661	106663	106665	106666	106667	106671	106675
												
Ions/gases	Ammonia gases	Sodium	Silver / Sulfide	Bromide	Calcium	Chloride	Cyanide	Copper	Fluoride	Fluoride	Potassium	Nitrate
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	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 ⁻
Reference electrolyte	-	3 mol/l KCl	-	-	-	-	-	-	-	-	-	-
Diaphragm	-	Platinum wire	-	-	-	-	-	-	-	-	-	-
pH range	4 ... 12	8 ... 11	2 ... 12	1 ... 12	2.5 ... 11	2 ... 12	0 ... 14	2 ... 6	5 ... 7	5 ... 7	2 ... 12	2.5 ... 11
Temperature range	0 ... 50 °C	-10 ... +80 °C	0 ... 80 °C	0 ... 80 °C	0 ... 40 °C	0 ... 80 °C	0 ... 80 °C				0 ... 40 °C	
Membrane resistance	-	< 500 MΩ	< 1 MΩ	< 0.1 MΩ	1 bis 4 MΩ	< 1 MΩ	< 30 MΩ	< 1 MΩ	0.15 ... 0.2 MΩ	0.15 ... 0.2 MΩ	< 50 MΩ	1 bis 5 MΩ
Membrane	-	Glass electrode	Solid state electrode	Solid state electrode	Matrix electrode	Solid state electrode	Solid state electrode	Solid state electrode	Solid state electrode	Solid state electrode	Matrix electrode	Matrix electrode
Immersion depth	Min.: 5 mm, Max.: 50 mm	Min.: 20 mm, Max.: 100 mm	Min.: 20 mm, Max.: 80 mm				Min.: 20 mm, Max.: 80 mm					
Shaft length	120 mm						120 mm					
Shaft diameter	12 mm						12 mm					
Add. scope of delivery	3 exchange heads, 50 ml electrolyte solution	-	Electrolyte	Electrolyte	Electrolyte and exchange heads	Elektrolyt	Electrolyte				Electrolyte and exchange heads	Elektrolyt und Austauschkopf
Connection	S7 plug head		Waterproof DIN plug				Waterproof DIN plug		BNC plug	Waterproof DIN plug		
Cable	without cable*		1 m fixed cable				1 m fixed cable					








*=Suitable connection cables can be found on page 28

pH Electrodes Guide - Applications


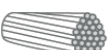



SenTix®		Field					Lab											
		2x	4x/940	5x/950	Top	Sp-T	6x	8x/980	9x	H	HWx	Micx	Spx	Sur	RJD	945	Sensolyt® 900 P	
Application																		
Chemistry	Diluted acids						●	●	●		○						●	
	Diluted alkalis									●								
	Emulsions, water-based						●	●	●	●	●						●	●
	Non-aqueous liquids		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

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)											●				●		
Solids (Surface)	Solids (Surface)															●		
																●		
Beverages	Beer											○	●	●		●		●
	Lemonade											●	●	●		○		●
	Sparkling Water											○	○	○	○	○		○
	Fruit juice												●	●	●		○	●
	Vegetable juice												○	○	○		○	●
	Wine												○	○	○		○	●
	Milk												○	○	○		○	●
													○	○	○		○	●
Food	Bread															●		
	Coffee extract												○	●	●	●		●
	Fish															●		
	Honey															●		○
	Marmalade															●		○
	Butter / margarine															●	●	
	Mayonnaise															●	●	
	Meat															●		
	Sausage															●		
	Vinegar															●		○
	Fruits / vegetabels															●		
	Cheese															●		
	Yogurt															●	○	○
	Pharma, Biology, Medicine	Agar-agar gel															●	
Bacterial cultures																●		
Enzyme solutions													●	●	●		●	
Gastric juice													●	●	●		○	●
Infusion solutions													●	●	●		○	●
Protein-containing liquids													●	●	●		○	●
Saliva																○	●	
Serum																●		○
Tris buffer solutions																●		○
Urine																●		○
Vials																●		

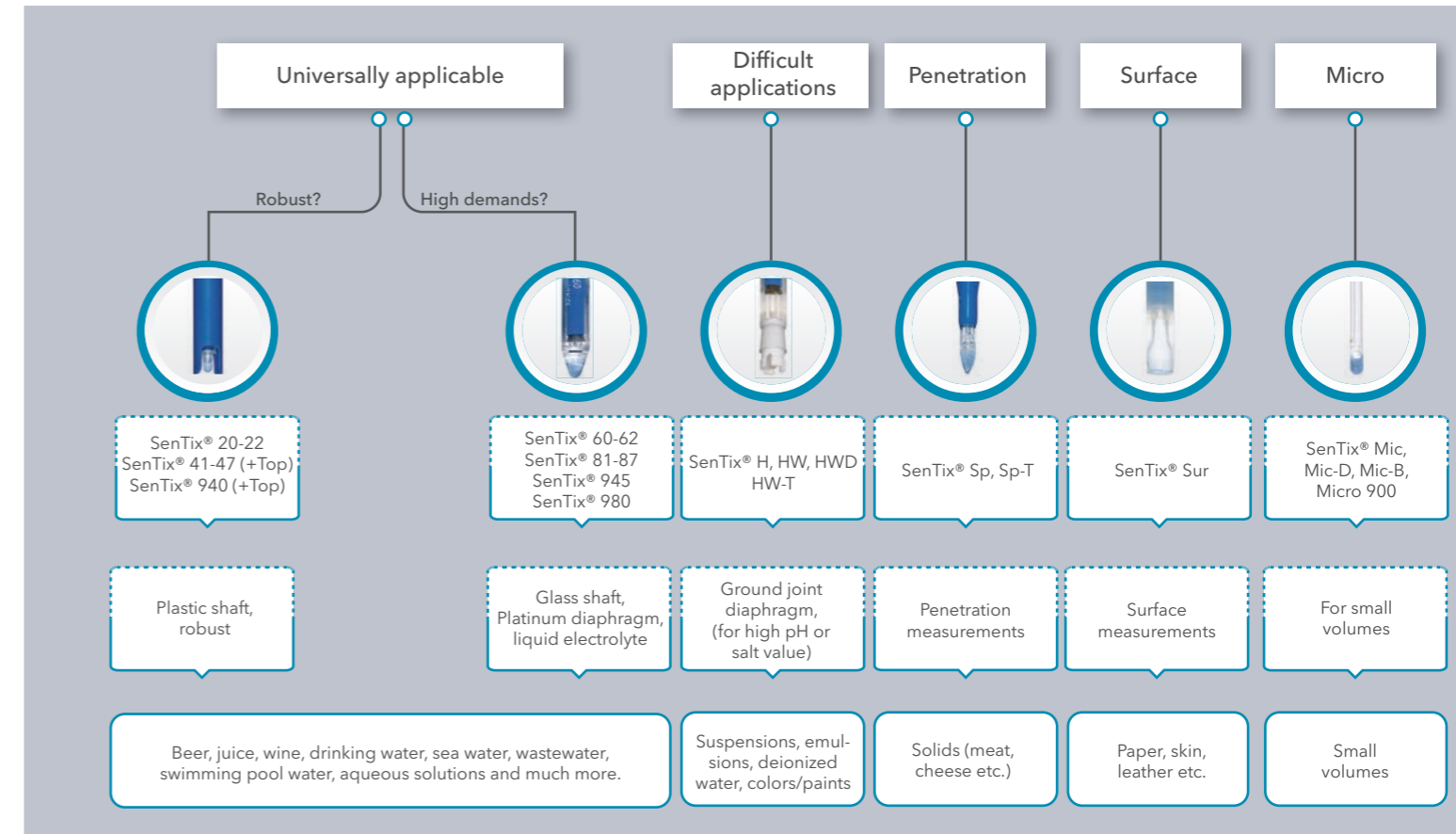
pH Electrodes Guide - Membranes

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

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.xylymanalytics.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.





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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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 KNO ₃ + 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


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: <ul style="list-style-type: none"> 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): <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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): <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 (without meter and sensors) incl. <ul style="list-style-type: none"> • 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) (without meter and sensors) incl.: <ul style="list-style-type: none"> • Armoring SM Pro • Buffer STP 4 and STP 7 • Stand & beaker • Conductivity standard 1413 µS/cm at 25° C

Armorings

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

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- **Questions from your employees**, for example, when operating the sensor, can be clarified on site by our experts.
- 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**.

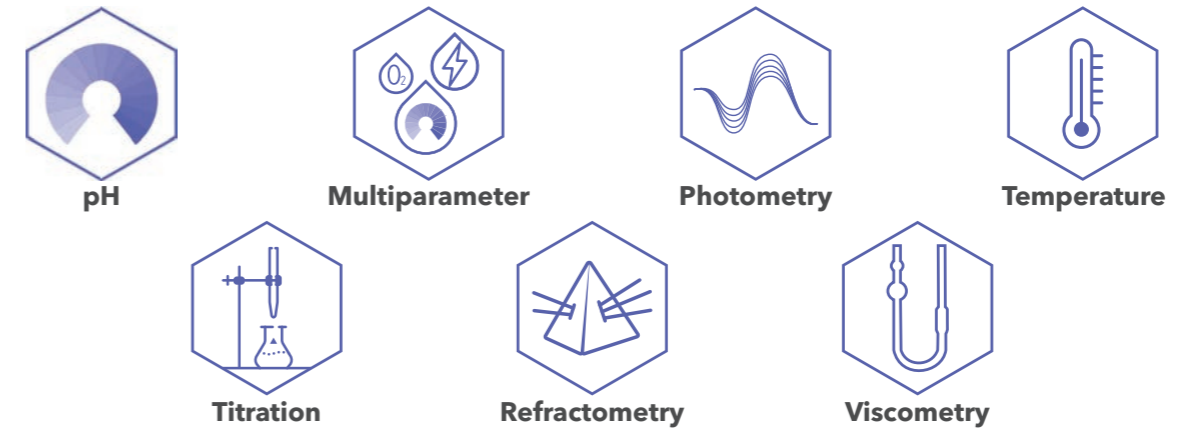
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Xylem | 'zīləm|

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

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