

pH electrodes / conductivity measurement cells and their applications

		Effluent samples	General aqueous solutions	Aquaria	Beer, fruit juice, wine	Butter, yoghurt, cheese	Substances containing protein	Emulsions, aqueous	Emulsions, part aqueous	Earth (suspension)	Extreme pH values (pH<1, pH>13)	Penetration meas. in meat	Penetration meas. in fruit, veg	Substances with hydrofluoric acid	Galvanic sewage	Hot electrolyte	Highly-viscous aqueous solutions	Solutions low in ions	Jams	Cosmetic products	Leather manufacturing	Milk	Rain water	Brine	Swimming pools	Soaps, detergents	Aqueous suspensions	Part-aqueous suspensions	Pastry, bread	Part-aqueous sol. >10% H ₂ O	Part-aqueous sol. <10% H ₂ O	Temperatures to +80°C	Temperatures to +100°C	TRIS buffer solutions	
Universal-electrode, type 01 pH	[pH]	+	+	+	0	-	-	0	0	0	0	-	-	-	0	-	-	-	-	0	0	0	0	+	0	0	-	-	0	-	0	-	0		
Lab. electrode, type 02 pH	[pH]	0	+	+	0	-	-	0	0	0	+	-	-	0	0	0	0	0	-	0	+	0	0	+	+	0	0	-	-	0	0	+	0	0	
Universal electrode, type 04 pH	[pH/°C]	+	+	+	0	-	-	0	0	0	0	-	-	-	0	-	-	0	-	0	0	0	0	+	+	0	0	-	-	0	-	-	-	0	
Special electrode, type 05 pH	[pH/°C]	+	+	0	+	-	0	+	+	+	+	-	-	0	+	-	-	0	-	0	0	0	+	+	+	+	+	+	-	0	0	-	-	0	
Penetration electrode, type 03 pH	[pH]	0	0	0	0	+	+	+	+	+	-	0	0	-	0	-	+	-	+	+	-	+	-	+	0	+	+	+	+	0	0	0	-	-	-
Robust penetr. electrode, type 13 pH	[pH]	0	0	0	0	+	+	+	+	+	-	+	+	-	0	-	+	-	+	+	-	+	-	+	-	+	+	+	+	0	0	-	-	-	
Conductivity meas. cell, type 07 mS	[mS/°C]	+	+	+	+	-	+	+	0	0	0	-	-	0	+	-	-	+	-	+	+	+	+	+	+	+	0	0	-	0	0	-	-	+	
Conductivity meas. cell, type 10 mS	[mS/°C]	+	+	+	+	-	+	+	0	0	0	-	-	0	+	-	-	+	-	+	+	+	+	+	+	+	0	0	-	0	0	-	-	+	
		+ suitable		0 suitable in certain cases												- not suitable																			

Analytical instruments are only as accurate as the sensor used to perform the measurements. When measuring pH or conductivity only those probes suited to the particular substance can guarantee an accurate reading.

What is conductivity?

For electric conductivity electrical resistance is measured between two electrodes e.g. in a liquid.

The lower the resistance the higher the conductivity and vice versa. Substances such as salt dissolved in water lower the electrical resistance thus increasing conductivity.

Example: Cooking salt

If cooking salt (NaCl) is added to water the salt then breaks down into its components (ions) Na⁺ and Cl⁻. Ions are charged particles and are responsible for the electrical resistance of the water.

The conductivity provides information on the total number of dissolved, charged components. If, for example, the conductivity in a lake has increased during a specific time the number of particles dissolved also increases. An exact analysis of the contents in the laboratory will reveal the cause of this alarming increase.

Testo conductivity measurement systems guarantee problem-free conductivity measurement thanks to:

- a robust and user-friendly handheld instrument with simultaneous display of conductivity (referred to reference temperature) and the temperature of the product being measured.
- the adaptability of the measuring system to different measuring solutions on account of its adjustable temperature coefficient.
- a robust measuring cell with 4 electrode measurement technology to protect from disturbing influences

caused by polarisation effects.

- fully automatic temperature compensation with the help of a temperature sensor integrated in the measuring cell.
- the display and documentation of measured and calibrated data.

Conductivity measurement cells

The 4 electrode measurement technology in our sensors enables an extensive measuring range to be covered with only one measuring cell. It also prevents the readings becoming distorted by the formation of physical coatings, such as in waste water for example, ensuring accurate results every time.

4 electrode cells do not require replating unlike 2 electrode cells which means they have an almost unlimited lifetime.

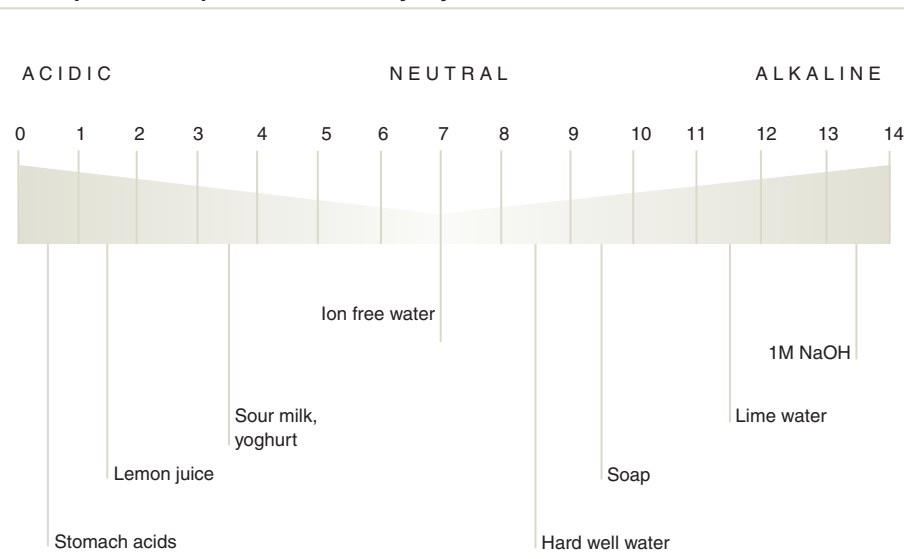
Why You Should Choose Water Analysis Instruments from Testo

pH electrodes

In conventional electrodes suspensions and emulsions as well as solutions containing proteins or sulphides can block the very many small pores in the diaphragm. The testo single pore diaphragm, sensor type 05 pH, has proved to be highly effective for such critical applications. It consists of a single large pore which cannot become blocked due to the wide diameter of the pore. Quick response times and correct measured results are therefore guaranteed.

The large pore diaphragm, type 03, is ideal for accurate measurements in solids and semi-solids (i.e., food). It consists of a very large "pore" which allows it to respond quickly and accurately when measuring solids/semi-solids.

Examples of the pH values of everyday substances



Definition of the pH value

pH is the abbreviation of the Latin expression "pondus hydrogenii" (pondus = pressure, hydrogenium = hydrogen). It is therefore a measure for the activity of

the hydrogen ions in a substance. The activity is connected directly to its acidic, neutral or alkaline character.

New robust pH penetration probe for testo 230

- Ergonomic handle design makes your work easier.
- The new T-handle design prevents buckling.
- pH glass embedded in break-proof plastic sleeve.
- Cardanic storage of tip in plastic coating. Bending forces on tip do not pose a problem. Less chance of breaking glass! Patent pending.
- Greater penetration power possible.
- Robust 5 mm cable with PUR coating.
- Not affected by dirt thanks to hole diaphragm. With food-proof electrolyte.

