











# Electrodes for pH measurement

Which electrode for which application?

Application	Specifics	Electrode	Order no.	Application	Specifics	Electrode	Order no.
<b>General</b>	Standard laboratory, various samples, pH 0...14, T = 0...100 °C	Unitrode	6.0258.600	<b>Detergents, surfactants</b>	General	Viscotrode	6.0239.100
	Routine analysis in similar samples, pH 1...11	Ecotrode Gel	6.0221.600		Samples with pH >10	Profitrode	6.0255.100
<b>Water</b>	Demineralized, drinking and sea water, weakly buffered solutions	Aquatrode Plus	6.0257.600	<b>Leather, paper, textile industry</b>	Bleaching & dye baths	Profitrode	6.0255.100
					Dampening solutions (offset printing), glue	Unitrode	6.0258.600
<b>Waste water</b>	General	Unitrode	6.0258.600		Leather, paper, textiles (surface measurement)	Flat-membrane	6.0256.100
	Sulfide-containing waste water	Profitrode	6.0255.100		Washing liquors	Viscotrode	6.0239.100
<b>Soil samples</b>	Surface measurement or aqueous suspensions	Flat-membrane	6.0256.100	<b>Paints, lacquers, solvents</b>	Dye baths, ink, wood stain, lacquers	Profitrode	6.0255.100
					Dispersions, emulsions, resins, suspensions	Unitrode	6.0258.600
<b>Agriculture, plant breeding</b>	Culture media, small volume samples	Biotrode	6.0224.100		Paint (surface)	Flat-membrane	6.0256.100
	Fertilizers	Unitrode	6.0258.600		Non-aqueous, polar solvents	EtOH-Trode	6.0269.100
	Liquid manure	Profitrode	6.0255.100	<b>Electroplating, metal processing</b>	General	Profitrode	6.0255.100
	Nutrient solutions	Viscotrode	6.0239.100		Acidic electroplating baths	Unitrode	6.0258.600
	Protein-containing solutions	Porotrode	6.0235.200		Cutting-oil emulsions	Viscotrode	6.0239.100
<b>Food, stimulants</b>	General	Unitrode	6.0258.600	<b>Special applications</b>	Concentrated acids	Profitrode	6.0255.100
	Protein-containing food, beer	Porotrode	6.0235.200		Photographic baths, fixative solutions	Profitrode	6.0255.100
	Penetration measurement (dough, cheese, meat)	Spearhead	6.0226.100		Emulsions, suspensions, dispersions	Unitrode	6.0258.600
	Drinking water	Aquatrode Plus	6.0257.600		Polymer dispersions (water-based dispersion paints and adhesive dispersions on basis of acrylic acid esters and styrene)	Ecotrode Gel	6.0221.600
	Juices, wine, spirits	Unitrode	6.0258.600		Samples at pH >12	Unitrode	6.0258.600
					Temperature 80...100 °C	Unitrode (Idrolyte)	6.0258.600
<b>Pharmaceutical industry, biology</b>	Creams, liquid formulations, medicinal syrups mouthwashes, raw materials	Viscotrode	6.0239.100		Ion-deficient solutions, weakly buffered solutions	Aquatrode Plus	6.0257.600
	Dialysis solutions, urine	Unitrode	6.0258.600		Non-aqueous, polar solvents	EtOH-Trode	6.0269.100
	Gastric juice, serum, small-volume samples	Biotrode	6.0224.100		Penetration measurement	Spearhead	6.0226.100
	Infusion solutions	Aquatrode Plus	6.0257.600		Protein-containing solutions	Porotrode	6.0235.200
	Protein-containing solutions	Porotrode	6.0235.200		Small volume samples	Biotrode	6.0224.100
						Flat-membrane	6.0256.100
<b>Cosmetics</b>	Shampoos, emulsions, shower gels, lotions, perfumes	Viscotrode	6.0239.100		Surface measurements	Flat-membrane	6.0256.100
	Make-up	Microelectrode	6.0234.100		Biofuels	EtOH-Trode	6.0269.100
	Skin (surface measurement)	Flat-membrane	6.0256.100				

# Practical tips, care and maintenance of pH electrodes

Unitrode	Ecotrode Gel	Aquatrode Plus	Profitrode	Viscotrode	Biotrode	Spearhead pH electrode	Porotrode	Flat-membrane pH electrode	EtOH-Trode
<p>Combined pH glass electrode, fixed ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• Very low alkali error</li> <li>• Insensitive to contamination</li> <li>• High-temperature resistance</li> </ul> <p><b>Ordering info</b> 6.0259.100 without cable, plug-in head G 6.0258.010 (with Pt1000), fixed cable, plug F+ 2 x 2 mm 6.0258.600 (with Pt1000), without cable, plug-in head U iUnitrode: 6.0278.300<sup>3)</sup> dUnitrode: 6.00200.300<sup>4)</sup></p>	<p>Combined pH glass electrode, twin-pore diaphragm.</p> <ul style="list-style-type: none"> <li>• For routine measurements in similar samples</li> <li>• With lifetime indicator</li> <li>• Maintenance-free reference electrolyte (gel)</li> </ul> <p><b>Ordering info</b> 6.0221.100 without cable, plug-in head G 6.0221.600 (with NTC), without cable, plug-in head U</p>	<p>Combined pH glass electrode, fixed ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• For low-conductivity or weakly buffered solutions</li> <li>• Very rapid response</li> <li>• Insensitive to contamination</li> </ul> <p><b>Ordering info</b> 6.0253.100 without cable, plug-in head G 6.0257.600 (with Pt1000), without cable, plug-in head U iAquatrode Plus: 6.0277.300<sup>3)</sup> dAquatrode Plus: 6.00202.300<sup>4)</sup></p>	<p>Combined pH glass electrode, flexible ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• For difficult matrices</li> <li>• Very easy to clean</li> <li>• Double-junction construction</li> </ul> <p><b>Ordering info</b> All without cable, plug-in head G 6.0255.100 (fitting length: 113 mm) 6.0255.110 (fitting length: 170 mm) 6.0255.120 (fitting length: 310 mm) dProfitrode: 6.00204.300<sup>4)</sup></p>	<p>Combined pH glass electrode, flexible ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• For viscous, protein or sulfide-containing solutions</li> <li>• Easy-to-clean diaphragm</li> </ul> <p><b>Ordering info</b> 6.0239.100 without cable, plug-in head G</p>	<p>Combined pH glass electrode, plied Pt-wire diaphragm.</p> <ul style="list-style-type: none"> <li>• For small-volume samples</li> <li>• For protein-containing samples and samples containing organic solvents</li> <li>• Shaft diameter 3 mm</li> <li>• Reference electrolyte: Idrolyte<sup>1)</sup> 6.2308.040</li> </ul> <p><b>Ordering info</b> 6.0224.100 without cable, plug-in head G</p>	<p>Combined pH glass electrode, twin-pore diaphragm.</p> <ul style="list-style-type: none"> <li>• For measurement in semi-solid samples</li> <li>• Maintenance-free reference electrolyte (gel)</li> <li>• Very easy to clean</li> </ul> <p><b>Ordering info</b> 6.0226.100 without cable, plug-in head G</p>	<p>Combined pH glass electrode, ceramic capillary diaphragm.</p> <ul style="list-style-type: none"> <li>• For protein-containing or viscous samples</li> <li>• Reference electrolyte: Porolyte<sup>2)</sup> 6.2318.000</li> <li>• Very easy to clean</li> </ul> <p><b>Ordering info</b> 6.0235.200 without cable, plug-in head G</p>	<p>Combined pH glass electrode, fixed ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• For pH-measurement on surfaces (e.g. skin, leather, paper, textiles)</li> <li>• Very rapid response</li> <li>• For measurement of small-volume samples</li> </ul> <p><b>Ordering info</b> 6.0256.100 without cable, plug-in head G</p>	<p>Combined pH glass electrode, fixed ground-joint diaphragm.</p> <ul style="list-style-type: none"> <li>• For pH-measurements in EtOH and other polar solvents</li> <li>• Double-junction construction</li> </ul> <p><b>Ordering info</b> 6.0269.100 without cable, plug-in head G</p>
									
<p>Use 6.2308.040 Idrolyte<sup>1)</sup> as reference electrolyte for measurement at temperatures 80...100 °C or to suppress protein precipitation by KCl.</p> <p>Do not wipe electrode.</p> <p>Unitrodes filled with c(KCl) = 3 mol/L should be solely stored in 6.2323.000 storage solution.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>	<p>Store in c(KCl) = sat. 6.2308.000</p> <p>Do not wipe electrode.</p> <p>Rinse with water/ethanol to remove contamination.</p>	<p>Store in 6.2323.000 storage solution only.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>	<p>Store in bridge electrolyte.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p> <p>Slightly lift ring-shaped sleeve for cleaning ground-joint diaphragm.</p> <p>Loosen stuck ground-joint by immersing in hot water for a few minutes to dissolve adhering material.</p> <p>Spare ground-joint diaphragm for Profitrodes 6.0255.1X0: order no. 6.1243.020</p>	<p>Store in 6.2323.000 storage solution.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p> <p>Slightly lift ring-shaped sleeve for cleaning ground-joint diaphragm.</p> <p>Loosen stuck ground-joint by immersing in hot water for a few minutes to dissolve adhering material.</p>	<p>Store in 6.2308.040 Idrolyte<sup>1)</sup>.</p> <p>Do not wipe electrode.</p> <p>Do not clean the diaphragm mechanically because the platinum wire may be damaged.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>	<p>Store in 6.2308.000 KCl sat.</p> <p>Rinse with water or ethanol to remove contamination.</p> <p>Do not remove contamination in pinhole diaphragm mechanically or with a needle. The gel electrolyte might be damaged.</p> <p>Remove electrode slowly from sample to avoid underpressure in the gel electrolyte.</p>	<p>Store in 6.2323.000 storage solution.</p> <p>Rinse with water or ethanol to remove contamination.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>	<p>Store in 6.2323.000 storage solution.</p> <p>Add a small drop of dist. water on the surface to be measured.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>	<p>If reference electrolyte is c(KCl) = 3 mol/L store in 6.2323.000 storage solution.</p> <p>Do not wipe electrode.</p> <p>For cleaning/care 6.2325.000 pH kit is recommended.</p>

<sup>1)</sup> Idrolyte is a glycerol-based electrolyte whose ion activity corresponds to that of c(KCl) = 3 mol/L.

<sup>2)</sup> Porolyte is a KCl solution that has been gelled by polymerization and is used in electrodes with a capillary diaphragm (Porotrode).

<sup>3)</sup> An iConnect 2.854.0010 is required to connect an iTrode to the instrument.

<sup>4)</sup> dTrodes can only be used with a digital measuring module at an OMNIS Titrator / Titration Module.