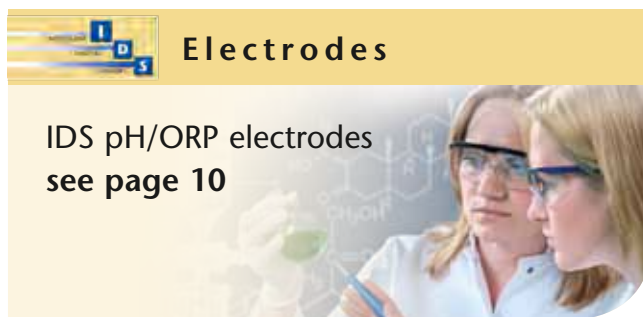


SenTix® pH electrodes for every application

SenTix® quality electrodes by WTW – convenient measurement and precision.

- Low-resistance glass membranes guarantee stable measuring signals even at low temperatures.
- Silver ion-free reference electrolyte, together with the proven platinum wire diaphragm, prevent measurement problems by precipitating silver compounds.
- Functional slide for accessing the refill opening for electrodes with liquid electrolyte.
- Connectors: Waterproof DIN connector, BNC connector, fixed cable (1 or 3 m, 3 ft. or 9 ft.) or plug head (S7 or SMEK).



IDS pH/ORP electrodes see page 10



Low-maintenance pH electrodes with gel electrolyte

Ideal for portable measurements, as well as for routine measurements in-the-laboratory. With or without built-in temperature probe all electrodes have robust plastic shafts and a low-maintenance gel reference system.



| SenTix® pH Electrodes | | | | | | | |
|--------------------------------------|-----------------------------|-----------------------|-------------------------|-----------------------|-----------------------|-------------------------|-----------------------|
| Modell | SenTix® 20 103 630 | SenTix® 21 103 631 | SenTix® 21-3 103 632 | SenTix® 22 103 633 | SenTix® 41 103 635 | SenTix® 41-3 103 636 | SenTix® 42 103 637 |
| Measuring range pH | 0 ... 14 pH | | | 0 ... 14 pH | | | |
| Operating range °C (°F) | 0 ... 80 °C (32 ... 176 °F) | | | 0 ... 80 °C | | | |
| Reference electrolyte | Gel | | | Gel | | | |
| Membrane shape | Cylindrical | | | Zylinder | | | |
| Membrane resistance at 25 °C (77 °F) | <1 GΩ | | | <1 GΩ | | | |
| Diaphragm | Fiber | | | Fiber | | | |
| Shaft material | Plastic | | | Plastic | | | |
| Shaft length** | 120 mm (4.72 in.) | | | 120 mm (4.72 in.) | | | |
| Shaft Ø*** | 12 mm (0.47 in.) | | | 12 mm (0.47 in.) | | | |
| Temperature probe | — | | | Built-in NTC (30 KΩ) | | | |
| Connection | ① | ② | ② | ② | ② | ② | ② |
| Electrode cable | ③* | ④ | ⑤ | ④ | ④ | ⑤ | ④ |
| Electrode plug | ⑥/⑦ | ⑥ | ⑥ | ⑦ | ⑥+⑧ | ⑥+⑧ | ⑦+⑧ |

* not included

** ±2 mm/±0.08 in.

*** ±0.5 mm/±0.02 in.

①: Plug head, ②: Fixed cable, ③: AS/DIN, AS/DIN-3 or AS/BNC, ④: Cable length 1 m (3 ft), ⑤: Cable length 3 m (9 ft), ⑥: DIN plug, ⑦: BNC plug, ⑧: Banana plug

SenTix® Special Electrodes – pH electrodes for unique applications



Special samples need special electrodes. SenTix® special electrodes can take on the challenges associated with measuring the pH value of surfaces, solids, suspensions, emulsions, low ionic samples, smallest volumes and more. For those who require a non-glass electrode: The SenTix® FET can be used with every WTW pH meter.



| SenTix® pH Electrodes | | | | | | | | | | |
|--------------------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|
| Model | SenTix® 51 103 651 | SenTix® 52 103 652 | SenTix® 60 103 639 | SenTix® 61 103 640 | SenTix® 62 103 641 | SenTix® 81 103 642 | SenTix® 82 103 643 | SenTix® 91 103 695 | SenTix® 92 103 696 | SenTix® L 103 655 |
| Measuring range pH | 0 ...14 pH | | 0 ...14 pH | | | 0 ... 14 pH | | 0 ...14 pH | | 0 ... 14 pH |
| Operating range °C (°F) | 0 ... 80 °C (32 ... 176 °F) | | 0 ...100 °C (32 ... 212 °F) | | | 0 ...100 °C (32 ... 212 °F) | | 0 ...100 °C (32 ... 212 °F) | | 0 ...100 °C (32 ... 212 °F) |
| 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 | | KCl 3 mol/l, Ag ⁺ -free |
| Membrane shape | Cylindrical | | Conical | | | Conical | | Spherical | | Spherical |
| Membrane resistance at 25 °C (77 °F) | <1 GΩ bei 25 °C (77 °F) | | <600 MΩ at 25 °C (77 °F) | | | <600 MΩ at 25 °C (77 °F) | | <600 MΩ at 25 °C (77 °F) | | < 600 MΩ at 25 °C (77 °F) |
| Diaphragm | Ceramics | | Platinum | | | Platinum | | Platinum | | Platinum |
| Shaft material | Plastic | | Glass | | | Glass | | Glass | | Glass |
| Shaft length** | 120 mm (4.72 in.) | | 120 mm (4.72 in.) | | | 120 mm (4.72 in.) | | 120 mm (4.72 in.) | | 425 mm (46.73 in.) |
| Shaft Ø*** | 12 mm (0.47 in.) | | 12 mm (0.47 in.) | | | 12 mm (0.47 in.) | | 12 mm (0.47 in.) | | 12 mm (0.47 in.) |
| Temperature probe | Built-in NTC (30 KΩ) | | - | | | Built-in NTC (30 KΩ) | | Built-in NTC (30 KΩ) | | Built-in NTC (30 KΩ) |
| Connection | ② | ② | ① | ② | ② | ② | ② | ② | ② | ① |
| Electrode cable | ④ | ④ | ③ * | ④ | ④ | ④ | ④ | ④ | ④ | ⑤ * |
| Electrode plug | ⑥+⑧ | ⑦+⑧ | ⑥/⑦ | ⑥ | ⑦ | ⑥+⑧ | ⑦+⑧ | ⑥+⑧ | ⑦+⑧ | ⑥+⑧/⑦+⑧ |

* not included
 ** ±2 mm/±0.08 in.
 *** ±0.5 mm/±0.02 in.

①: Plug head, ②: Fixed cable, ③: AS/DIN, AS/DIN-3 or AS/BNC, ④: Cable length 1 m (3 ft), ⑤: Cable length 3 m (9 ft), ⑥: DIN plug, ⑦: BNC plug, ⑧: Banana plug

- Parameter
- Multi-parameter
- pH
- ORP
- ISE
- Dissolved Oxygen (D.O.)
- Conductivity
- Data logger/flow + level
- BOD/Respiration
- Photometers
- Turbidity
- Colony Counter
- Software/Printers

Specialists for any event – pH electrodes for special applications

The consistencies of samples in which pH is measured are very different. Liquid or solid, low-ion medium or highly concentrated, aqueous or non-aqueous phases, with or without suspended solids. In some cases even smallest volumes have to be identified and sometime glass is not acceptable. All of this can be tackled using the specialists of WTW:

For measurements in or on solids, penetration or surface electrodes are recommendable. The split ring electrode with liquid filling is suitable for determining the pH value in low-ion or concentrated solutions and also for emulsions. Samples with suspended solids can be determined the easiest using a polymer electrode. Microelectrodes can help when there are only low volumes available. And when glass is not accepted, for example in the food industry: then the ISFET electrode is the right choice.



SenTix® Special pH Electrodes

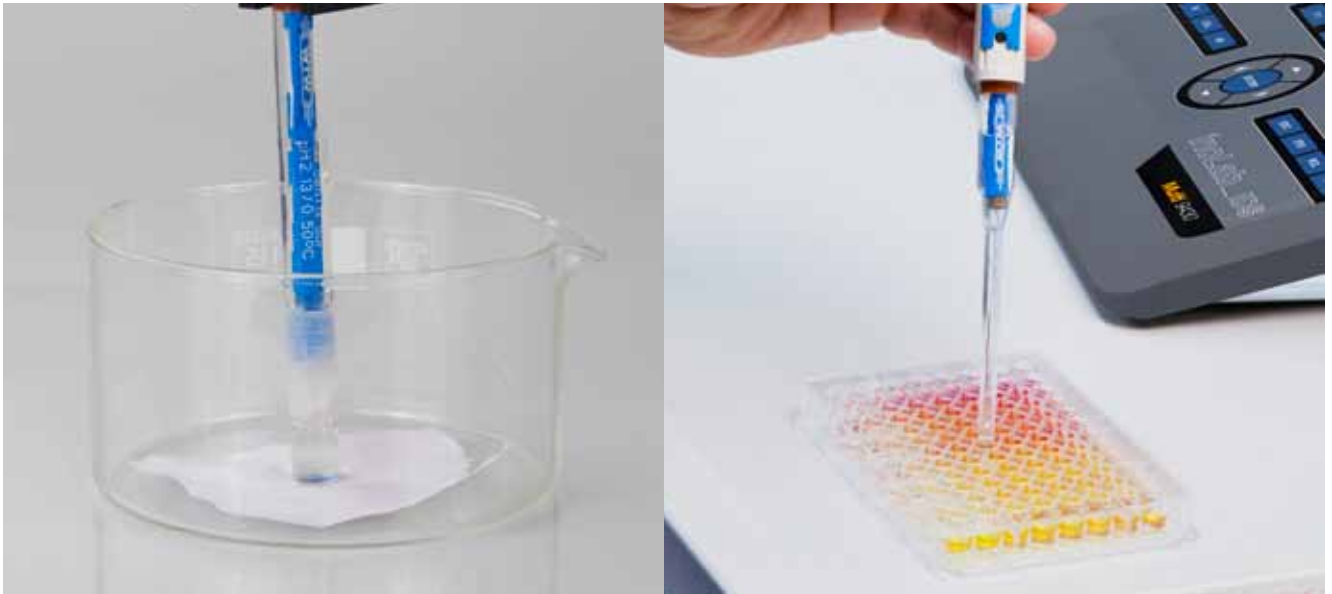
| Model | SenTix® H 103 644 | SenTix® HW 103 650 | SenTix® HWS 103 662 | SenTix® SP 103 645 | SenTix® SP-DIN 103 730 | SenTix® Sur 103 646 | SenTix® FET-D 103 700 | .../-B 103 702 |
|--------------------------------------|------------------------------------|--------------------------------|----------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------------|--------------------------------|
| Measuring range pH | 0 ... 14 pH | 0 ... 14 pH | 0 ... 14 pH | 2 ... 13 pH | 2 ... 13 pH | 2 ... 13 pH | 0 ... 14 pH | 0 ... 14 pH |
| Operating range °C | 0 ... 80 °C (32 ... 176 °F) | 0 ... 60 °C (32 ... 140 °F) | -5 ... 100 °C (23 ... 212 °F) | 0 ... 80 °C (32 ... 176 °F) | 0 ... 80 °C (32 ... 176 °F) | 0 ... 50 °C (32 ... 122 °F) | 0 ... 60 °C (32 ... 140 °F) | 0 ... 60 °C (32 ... 140 °F) |
| Reference electrolyte | KCl 3 mol/l, Ag ⁺ -free | | | Polymer | | Polymer | KCl 3.3 mol/l, Ag ⁺ -free | |
| Membrane shape | Cylindrical | Cylindrical | Spherical | Spear | Spear | Flat | ISFET | |
| Membrane resistance at 25 °C (77 °F) | < 2 GΩ | < 800 MΩ | < 600 MΩ | < 400 MΩ | < 400 MΩ | < 1 GΩ | — | |
| Diaphragm | Split ring | Split ring | Split ring | Hole | Hole | Split ring | Fritted polyethylene | |
| Shaft material | Glass | Glass | Glass | Plastic | Plastic | Glass | Plastic | |
| Shaft length (±2 mm/±0.08 in.) | 170 mm (6.69 in.) | 170 mm (6.69 in.) | 170 mm (6.69 in.) | 65/25 mm (2.56/0.98 in.) | 65/25 mm (2.56/0.98 in.) | 120 mm (4.72 in.) | 86 mm (3.39 in.) | |
| Shaft Ø (±0.5 mm/±0.02 in.) | 12 mm (0.47 in.) | 12 mm (0.47 in.) | 12 mm (0.47 in.) | 15/5 mm (0.59/0.02 in.) | 15/5 mm (0.59/0.02 in.) | 12 mm (0.47 in.) | 17 ... 13 mm (0.67 ... 0.51 in.) | |
| Temperature probe | — | — | Built-in NTC (30 KΩ) | — | — | — | NTC (30 KΩ) | |
| Connection | ① | ① | ① | ① | ② | ① | ② | ② |
| Electrode cable* | ③* | ③* | ⑨* | ③* | ④ | ③* | ④ | ④ |
| Electrode plug | ⑥/⑦ | ⑥/⑦ | ⑥+⑧/⑦+⑧ | ⑥/⑦ | ⑥ | ⑥/⑦ | ⑥+⑧ | ⑦+⑧ |

* not included

** (±0.5 mm/±0.02 in.)

*** from upper edge of ground

①: Plug head, ②: Fixed cable, ③: AS/DIN, AS/DIN-3 or AS/BNC, ④: Cable length 1 m (3 ft), ⑤: Cable length 3 m (9 ft), ⑥: DIN plug, ⑦: BNC plug, ⑧: Banana plug, ⑨: AS S/D1 or AS S/D3 or AS S/B1 or AS S/B3, ⑩: AS S/R



SenTix® Special pH Electrodes

| | SenTix® | | | SenTix® RJS | SenTix® pH | SenTix® R | SenTix® B | SenTix® V |
|--------------------------------------|------------------------------------|------------------|-------------------------|---------------------------|---------------------------|------------------------------------|-------------------------------|-----------------------------|
| Model | Mic 103 647 | Mic-D 103 660 | Mic-B 103 661 | 103 663 | 103 667 | 103 668 | 103 669 | 103 690 |
| Measuring range pH | 0 ... 14 pH | | | 2 ... 13 pH | 0 ... 14 pH | – | – | 0 ... 14 pH |
| Operating range °C (°F) | 0 ... 100 °C (32 ... 212 °F) | | | 0 ... 80 °C (32...176 °F) | 0 ... 80 °C (32...176 °F) | –5 ... 100 °C (23 ... 212 °F) | –5 ... 100 °C (23 ... 212 °F) | 0 ... 80 °C (32 ... 176 °F) |
| Reference electrolyte | KCl 3 mol/l, Ag ⁺ -free | | | Polymer | – | KCl 3 mol/l, Ag ⁺ -free | Double electrolyte system | Gel |
| Membrane shape | Cylindrical | | | Calotte | Spherical | – | – | Flat |
| Membrane resistance at 25 °C (77 °F) | < 700 MΩ | | < 1 GΩ | < 600 MΩ | < 600 MΩ | – | – | < 500 MΩ |
| Diaphragm | Ceramic | | Platinum | Split ring | – | Platinum | Split ring | Fiber |
| Shaft material | Glass | | | Glass | Glass | Glass | Glass | Noryl |
| Shaft length (±2 mm/±0.08 in.) | 40/80 mm (1.57/3.15 in.) | | 96 mm (3.78 in.) *** | 120 mm (4.72 in.) | 120 mm (4.72 in.) | 120 mm (4.72 in.) | 103 mm (4.06 in.) *** | 31/20 mm (1.22/0.79 in.) |
| Shaft Ø ** | 12/5 mm (0.47/0.02 in.) | | 3 mm (0.12 in.) | 12 mm (0.47 in.) | 12 mm (0.47 in.) | 12 mm (0.47 in.) | 12 mm (0.47 in.) | 17/19 mm (0.67/0.75 in.) |
| Temperature probe | – | | | Built-in NTC (30 KΩ) | – | – | – | NTC (30 KΩ) |
| Connection | ① | | ② | ① | ① | ① | ① | – |
| Electrode cable* | ③ * | | ④ | ③ * | ③ * | ⑩ * | ⑩ * | – |
| Electrode plug | ⑥/⑦ | | ⑥/⑦ | ⑥+⑧/⑦+⑧ | ⑥/⑦ | ⑧ | ⑧ | – |

* not included
 ** (±0.5 mm/±0.02 in.)
 *** from upper edge of ground

①: Plug head, ②: Fixed cable, ③: AS/DIN, AS/DIN-3 or AS/BNC, ④: Cable length 1 m (3 ft), ⑤: Cable length 3 m (9 ft), ⑥: DIN plug, ⑦: BNC plug, ⑧: Banana plug, ⑨ AS S/D1 or AS S/D3 or AS S/B1 or AS S/B3, ⑩ AS S/R

Parameter

Multi-parameter

pH

ORP

ISE

Dissolved Oxygen (D.O.)

Conductivity

Data logger/flow + level

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers

Applications for SenTix® Electrodes

| | ● Recommended by WTW | | ○ Conditionally applicable | | | | * Only recommended for specified model | | | | | | | |
|----------------------------|----------------------|--------------------------|--------------------------------------|-----------------------|----------------------|-----------------------|--|-----------|-----------------|-----------------------|-------------|---------------------------------|-------------|---|
| | SenTix® V | SenTix® 20 21-..., 22 | SenTix® 41, 41-3, 42, RJS, 940 | SenTix® 51, 52 950 | SenTix® 60, 61 62 | SenTix® 81, 82 980 | SenTix® 91, 92, L | SenTix® H | SenTix® HW, HWS | SenTix® Sp, Sp-DIN | SenTix® Sur | SenTix® Mic, MIC-D, MIC-B | SenTix® FET | SenTix® ORP, ORP 900, PtR, Ag, Au Au, ORP* |
| Acids | | | | | ● | ● | ● | | ○ | | | | | |
| Ammonia | | | | | ○ | ○ | ○ | ● | | | | | | |
| Aquarium water | ● | ● | ● | ● | ○ | ○ | ○ | | | | | | | ORP, PtR* |
| Beer | | | | ● | ● | ● | | | ● | | | | | |
| Beverages | | | | ● | ● | ● | ● | ○ | ○ | | | | ○ | |
| Bleach solution | | | | | ○ | ○ | ○ | ● | ○ | | | | | |
| Boiler feedwater | | | | | ○ | ○ | ○ | | ● | | | | | |
| Bread | | | | | | | | | | ● | | | ● | |
| Cheese | | | | | | | | | | ● | | | ● | |
| Coffee extract | | | | ○ | ● | ● | ● | | ● | | | | ● | |
| Condensate | | | | | | | | | ● | | | | | |
| Cosmetics | ○ | | | | | | | | ● | | | | ● | |
| Deminerlized water | | | | | | | | | ● | | | | | |
| Developer | | | RJS* | | ○ | ○ | ○ | ● | ○ | | | | | |
| Dispersion colors | ○ | | RJS* | | | | | | ● | | | | | |
| Distilled water | | | | | | | | | ● | | | | | |
| Drinking water | ○ | ○ | ○ | ● | ● | ● | ● | | ○ | | | | | |
| Electroplating baths | ○ | | RJS* | ● | ● | ● | ● | | ○ | | | | | |
| Electroplating wastewater | ● | ● | ● | ○ | ○ | ○ | ○ | | ○ | | | | | ○ |
| Extracts | | | | | ○ | ○ | ○ | | ● | | | | | |
| Fixing baths | | | RJS* | ○ | ○ | ○ | ○ | ● | ● | | | | | ORP, PtR* |
| Fruit | | | | | | | | | | ● | | | ● | |
| Fruit juice | ○ | | | ● | ● | ● | ● | | ○ | | | | ○ | |
| Ground water | | ● | ● | ○ | ○ | ○ | ○ | | ○ | | | | | PtR* |
| Household cleaners | ○ | ○ | ○ | ○ | ● | ● | ● | ● | ○ | | | | | |
| Juice | ○ | | | ● | ● | ● | ● | | ○ | | | | ○ | |
| Leather | ○ | | | | | | | | | | ● | | | |
| Lemonade | | | | ● | ● | ● | ● | | ○ | | | | ○ | |
| Lyes | | | | | | | | ● | | | | | | |
| Margarine | | | | | | | | | | ● | | | ● | |
| Meat | | | | | | | | | | ● | | | ○ | |
| Milk | | | | | | | | | ● | | | | ○ | |
| Mineral water | | | | ○ | ● | ● | ● | | ○ | | | | ○ | |
| Non-aqueous liquids | | | | ○ | ○ | ○ | ○ | | ○ | | | | | |
| Oil/water emulsions | | | RJS* | | | | | | ● | | | | | |
| Paint, water-soluble | ○ | | RJS* | | | | | | ● | | | | ● | |
| Paper | ○ | | | | | | | | | | ● | | | |
| Paper extract | | | | | ● | ● | ● | | | | | | | |
| Protein-containing liquids | | | | | ● | ● | ● | | ● | | | MIC-D/-B* | | |
| Rainwater | | | | | ○ | ○ | ○ | | ● | | | | | |
| Saliva | ● | | | | | | | | | | ● | ○ | | |
| Salt solutions | ○ | ○ | ○ | ○ | ● | ● | ● | ○ | ● | | | | | |
| Saltwater | | | | ○ | ○ | ○ | ○ | ○ | ● | | | | | |
| Sausage | | | | | | | | | | ● | | | ● | |
| Shampoo | ○ | | | | | | | | ● | | | | ● | |
| Skin | ○ | | | | | | | | | | ● | | | |
| Soil extract | | | | | ● | ● | ● | | ● | | | | | |
| Solids (penetration) | | | | | | | | | | ● | | | ○ | |
| Solids (surface) | ○ | | | | | | | | | | ● | | | |
| Sulfide-containing liquids | | | RJS* | | | | | | ● | | | | | PtR* |
| Surface water | ○ | ● | ● | ● | ● | ● | ● | | ○ | | | | | |
| Suspensions | | | RJS* | | | | | | ● | | | | | |
| Swimming pool water | ● | ● | ● | ● | ○ | ○ | ○ | | | | | | | |
| Tap water | ○ | ○ | ○ | ● | ● | ● | ● | | ○ | | | | | |
| Tris buffer solutions | | | | | ● | ● | ● | | ● | | | | | |
| Vegetable juice | | | | | ● | ● | ● | | ○ | | | | ○ | |
| Vegetables | | | | | | | | | | ● | | | ● | |
| Wastewater | ○ | ● | ● | ○ | ○ | ○ | ○ | | | | | | | PtR* |
| Wine | | | | ● | ○ | ● | ● | | | | | | | |
| Yogurt | | | | | ● | ● | ● | | ● | ● | | | ● | |

** for ORP Measurement see page 46

Parameter
Multi-parameter
pH
ORP
ISE
Dissolved Oxygen (D.O.)
Conductivity
Data logger/flow + level
BOD/Respiration
Photometers
Turbidity
Colony Counter
Software/Printers