



pH	0...14 pH
mV	±1000 mV
Conductivity	0...100 mS/cm 0...1000 mS/cm
Salinity	0.0...70.0
TDS	0...100 g/l
Dissolved oxygen	0...20 mg/l 0...200%
Temperature	0...100 °C

*(C1020 only)*

One pH/mV channel  
One conductivity/oxygen channel  
One temperature channel

### pH

Multi-point (1...3) calibration with up to three buffers out of eleven pre-programmed pH buffers.

Reads pH with 0.01 pH resolution.

### mV

Features mV calibration for accurate ORP measurements.

Reads potentials with 1 mV resolution.

### Conductivity

Use a 1 cm<sup>1</sup> electrode to measure from 0.1 µS/cm to 100 mS/cm.

Use a 0.1 cm<sup>1</sup> electrode to measure from 0.01 µS/cm to 10 mS/cm.

*(C1020 only)*

Use a 10 cm<sup>1</sup> electrode to measure from 1 µS/cm to 1000 mS/cm.

*(C1020 only)*

Automatically selects correct range and frequency.

Selectable reference temperature: 20° or 25°C.

One-point calibration.

### Dissolved oxygen

Operates with a galvanic oxygen electrode requiring no polarisation time and no zero calibration.

Reads dissolved oxygen with 0.01 mg/l or 0.1% resolution.

Rapid air calibration.

### Temperature

Reads temperatures with 0.1 °C resolution.

Manual or automatic temperature compensation.

Calibrates temperature probe for quality measurements.

### Inputs

One common input for pH and mV.

One common input for conductivity and dissolved oxygen.

One input for a Pt1000 automatic temperature probe.

### Display

Bright LCD screen for better readability.

A white backlight automatically illuminates when operated on the mains.

Stability indicator prompts the user when readings should be taken.

The interactive LCD screen provides step by step instructions in the language of your choice (English, Dutch, French, German).

Shows a GLP report on the LCD screen.

### Data-logging *(C1020 only)*

Storage memory for 300 values including temperature.

### Cabinet

Robust dust and splash-proof cabinet.

### Special features

Three year warranty.

Optional 12 V car adaptor.

### Pre-programmed standards

pH buffers: 1.68, 2.00, 4.00, 4.01, 6.87, 7.00, 9.18, 9.21, 10.01, 12.00, 12.45 (at 25 °C).

Conductivity: 1413 µS/cm, 12.88 mS/cm, 111.8 mS/cm (at 25 °C).

CODE	DESCRIPTION
C1010	pH/conductivity/DO meter
C1020	pH/conductivity/DO meter
C10x0P	Meter kit for pH: meter + pH/ATC electrode SP10T + 2x50 ml buffers (pH 4 and 7) + 50 ml electrolyte (3M KCl)
C10x0K	Meter kit for conductivity: meter + conductivity/ATC electrode SK10T + 50 ml conductivity standard (0.01 M KCl)
C10x0Z	Meter kit for oxygen: meter (not C1010) + dissolved oxygen electrode SZ10T
C10x0T	Meter kit complete: meter + pH/ATC electrode SP10T + conductivity/ATC electrode SK10T + dissolved oxygen electrode SZ10T + 2x50 ml buffers (pH 4 and 7) + 50 ml electrolyte (3M KCl) + 50 ml conductivity standard (0.01 M KCl)
C10x0X	Meter kit without electrodes: meter + 2x50 ml buffers (pH 4 and 7) + 50 ml electrolyte (3M KCl) + 50 ml conductivity standard (0.01 M KCl)
A4049	Car adaptor, 12 V (optional)

→ Supplied with a mains adaptor (100...240 VAC, EU/US) (add a UK-sign for UK plug versions, e.g.:C1020-UK)

SPECIFICATIONS		C10x0
pH	Range	0...14 pH
	Resolution	0.01 pH
	Accuracy	0.2% ± 1 digit
	Calibration	1...3 points
	Buffers	11 pre-programmed
	Temperature compensation	0...100 °C
	ISO-pH	6...8 pH
	Slope	80...120%
mV	Range	±1000 mV
	Resolution	1 mV
	Accuracy	0.2% ± 1 digit
	Calibration	1 point
rH <sub>2</sub>	Range	
	Resolution	
CONDUCTIVITY	Range (cc dependent)	0...100 mS/cm (C1010) 0...1000 mS/cm (C1020)
	Resolution (cc dependent)	0.1 µS/cm (C1010) 0.01 µS/cm (C1020)
	Accuracy	1% f.s. of range
	Calibration	1 point
	Standards	3 pre-programmed
	Cell constant (cc)	1 cm <sup>-1</sup> ±30% (C1010) 0.1/1/10 cm <sup>-1</sup> ±30% (C1020)
	Temperature compensation	0...100 °C
	Reference temperature	20° or 25 °C
	Temperature coefficient	natural waters (EN27888)
	SALINITY (C1020 only)	Range
Reference temperature		15 °C
TDS (C1020 only)	Range	0...100 g/l
	Resolution	0.1 mg/l
DISSOLVED OXYGEN	Range	0...20 mg/l (0...200%)
	Resolution	0.01 mg/l (0.1%)
	Accuracy	1% ± 1 digit
	Calibration	1 point
	Temperature compensation	0...10 °C
	Salinity compensation	0...40
	Air pressure compensation	800...1200 hPa
TEMPERATURE	Range	0...100 °C
	Resolution	0.1 °C
	Accuracy	0.5 °C
	Calibration	1 point
INPUTS	pH/mV	BNC, 10 <sup>12</sup> Ω
	Conductivity/Dissolved oxygen	BNC
	Temperature	2 banana, for Pt1000
STORAGE MEMORY (C1020 only)	Data sets	300
DISPLAY	LCD	128x64 pixels
	White backlight	✓
AMBIENT CONDITIONS	Temperature	0...40 °C
	Humidity	0...95%, non condensing
POWER SUPPLY	Mains	100...240 VAC, 50/60 Hz
	Low voltage	9...15 VDC
DIMENSIONS	WxDxH	13x18x10 cm
WEIGHT	Meter	600 g

## SOME THEORY ABOUT pH

pH is a measurement for the acidity or alkalinity of a solution. In pure water the hydrogen ion (H<sup>+</sup>) and hydroxyl ion (OH<sup>-</sup>) concentrations are equal at 10<sup>-7</sup> M (25 °C). To provide a convenient and effective means of defining acidity and alkalinity, the pH is defined as the negative logarithm of hydrogen activity:

$$\text{pH} = -\log [\text{H}^+]$$

The heart of a pH measuring system is a membrane made from special pH-selective glass on which a very thin layer of hydrogen ions is formed when dipped in water. At high pH values, this layer will have a low hydrogen concentration. However, at low pH values a large number of H<sup>+</sup> ions diffuse in the layer. By measuring the generated electrical potential (E) in the layer the corresponding pH can be computed.

**Solution-1:** sample to be measured

**Solution-2:** known buffer solution (7 pH)

**Reference-1:** silver wire in a salt-bridge (KCl)

**Reference-2:** silver wire in a salt-bridge (KCl)

**Membrane layer-1:** H<sup>+</sup> ions generated by the sample

**Membrane layer-2:** H<sup>+</sup> ions generated by the buffer

The potential (E) between both wires will vary with the pH difference between sample and known buffer according the Nernst equation: (-59.2 mV/pH at 25 °C). A salt-bridge around each wire prevents direct metal contact with the solutions by using a wet junction for a stable electrical behaviour.

### Combination Electrode

A combination electrode has an indicating and a reference electrode combined into a single body that is easy to use and popular because of its compactness. A minimum amount of sample is required due to the close proximity of the pH responsive membrane and the liquid junction.

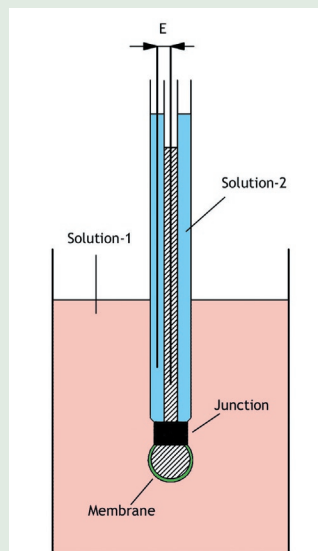
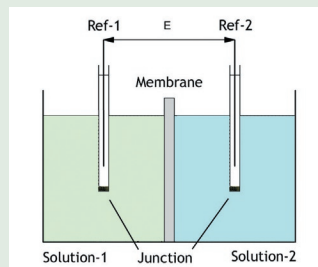
### Junction Types

**Glass combination electrodes** mostly feature an anti-fouling annular ceramic junction. The annular junction is formulated with a special ceramic which encircles the glass bulb. Numerous pores in the ceramic provide lower resistance and more stable pH readings.

**Epoxy body combination electrodes** come standard with a specially formulated porous ceramic plug junction.

Sleeve junctions provide the highest flow rate for difficult samples.

A double junction reference is constructed with an Ag/AgCl inner chamber and a chemically compatible reference solution in the outer chamber. It is recommended for samples containing organic compounds, proteins, heavy metals, and other compounds that interact with silver, such as bromides, iodides, cyanides, and sulphides.



## Electrodes supplied with kit versions



### SP10T

- pH + ATC
- Epoxy body, 1 m cable
- 0...14 pH, 0...80 °C
- Single junction, sealed



### SK10T

- Conductivity + ATC
- Epoxy body, 1 m cable
- 1 cm<sup>2</sup>, 0...80 °C
- Dual graphite plates



### SZ10T

- Galvanic type + ATC
- Epoxy body, 1 m cable
- 0...60 mg/l, 0...50 °C
- 3 m submersible cable

→ You will find ordering codes and descriptions of electrodes, calibration solutions, accessories... on pages 19...

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