



sartorius



Perfect  
Electrochemical Analysis  
Professional Meters  
Basic Meters  
Portable Meters  
Sensors



8.02<sup>pH</sup>

A S M 25.0°C  
4.00<sup>pH</sup>  
7.02<sup>pH</sup>  
10.07<sup>pH</sup>

19-02-2002 12:10:32

Mode

Standardize

Cal Data

Channel

Setup

Data Log

Clear

Enter/Print

## Highly intelligent technology for electrochemical analyses

We don't have to explain the basics of electrochemical analysis to you – pH, ion activity and conductivity are important measurements in your laboratory work.

Sartorius would like to show you how you can gain even greater precision, convenience and peace of mind in performing electrochemical analysis by using intelligent meters. We offer them for any application and to meet any requirements...

...with the excellent Sartorius quality that you've come to appreciate in our other products.

### **Sartorius Professional Meters –**

For professional measurements and optimal testing in laboratories. Easy to operate with the highest measurement accuracy – also for data management.

### **Sartorius Basic Meters –**

The compact, basic equipment for routine measurements in the lab. For reliable results in all applications.

### **Sartorius Portable Meters –**

Can be used anywhere fast, "on-the-spot" measurements are needed in the field. Solid performance at an attractive price.





# Data Log Menu

- 1) View data log
- 2) Turn logging On/Off; ON
- 3) Set logging interval
- 4) Clear data log
- 5) Set sample number
- 6) Set sample label
- 7) Print data log

Number of points in log:  
207



Mode

Standardize

Cal Data

Channel

Setup

Data Log

Clear

Enter/Print

1

2

3

4

5

6

7

8

9

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## Professional Meters – multi-talented instruments featuring Sartorius quality

### pH meters, ion meters, conductivity meters

Four models – with all options to meet the highest requirements. A range of performance levels is available – even a 3-in-1 sensor for 3 different values in one easy measurement: pH, temperature and electrical conductivity. Choose the meter that best suits your needs.

### Professional features – professional results

Large, backlit multifunction graphical VGA 5.7" display

Measuring accuracy down to  $\pm 0.1$  mV

Automatic temperature compensation

Menu-driven operation with plain language prompts

Automatic recognition of 26 standard buffers (NIST and DIN, among others)

Automatic checking of your combination electrode

Automatic calibration reminder

Stability icon; stability parameters can be adapted to the measuring task at hand

Alarm alerts user to out-of-tolerance values

Help function always available by soft keys

User-definable minimum time for a measurement

### Clear functions – clear advantages

Graphical display for calibration curves

Simultaneous display of a measured value and the temperature, also for parallel measurements of the pH and conductivity, for example

Research-grade – i.e., the highest – accuracy covering a broad range of concentrations

Excellent reliability and repeatability of the measured results

GLP | GMP | ISO-compliant documentation of the calibrations and results

RS-232C bidirectional interface for printer or computer





## Professional Meters – Four models



### PP-15 | pH meter for pH and ORP measurements

High resolution ensures even greater accuracy in electrochemical analysis.

The PP-15 Professional Meter can be used for pH and voltage measurements with

- Glass-membrane pH electrodes (combination electrodes) or electrodes with separate reference sensor
- Redox electrodes (ORP)
- Measurement modes: pH, mV, relative mV



### PP-20 | pH and conductivity meter

In addition to pH measurement, the high-end PP-20 Professional Meter offers research-grade conductivity measurements.

- The results measured are displayed as: conductivity, practical salinity, TDS, NaCl salinity, resistivity
- Calibration using up to 5 conductivity standards



### PP-25 | pH and ion-selective meter

In addition to convenient pH measurement, the PP-25 features the added capability of research-grade ion-selective analysis for a wide range of concentrations.

- Calibration with up to 7 calibration points
- Concentration readouts in %, ppm, ppt, ppb, mg/l, µg/l and mol/l
- Measurements are only possible after calibration
- Manual input of the electrode slope possible
- The PP-25 supports the following measuring methods for
  - Direct potentiometry
  - Standard addition/subtraction
  - Analate addition/subtraction



### PP-50 | pH meter, ion-selective meter and conductivity meter all in one unit

The fully professional PP-50 combines all features of the models introduced in this brochure. This convenient Professional Meter is designed for use in a broad range of applications in the field of potentiometric analysis.





Figure	Order number	Construction	Built-in temperature sensor	pH range	Temperature range
1	PY-P10	Plastic body; electrolyte: KCl 3 mol/l; free of silver ions; fiber junction	Yes	0 ... 14	-5°C ... 80°C
2	PY-P11	Glass body; electrolyte: KCl 3 mol/l; free of silver ions; platinum junction; toughened, low-resistance glass	Yes	0 ... 14	-5°C ... 100°C
3	PY-P12	Plastic body, gel-filled, fiber junction	Yes	0 ... 14	-5°C ... 80°C
3	PY-P20	Plastic body; gel-filled; fiber junction	No	0 ... 14	-5°C ... 80°C
2	PY-P21	Glass body; electrolyte: KCl 3 mol/l; free of silver ions; platinum junction; toughened, low-resistance glass	No	0 ... 14	-5°C ... 100°C
4	PY-P22	Micro electrode (length 110 mm, diameter 5 mm); electrolyte: KCl 3 mol/l; free of silver ions; platinum junction; low-resistance glass	No	0 ... 14	-5°C ... 100°C
5	PY-P23	Flat membrane electrode; glass body; gel-filled; annular gap junction; low-resistance glass	No	2 ... 13	-5°C ... 50°C
6	PY-P24	High-performance electrode; plastic body; electrolyte: KCl 3 mol/l, free of silver ions; adjustable sleeve junction for control of the flow rate of the KCl solution; low-resistance glass membrane	No	0 ... 14	-5°C ... 100°C

Figure	Order number	Construction	Built-in temperature sensor	pH range	Temperature range
7	PY-R01	Glass body; porous ceramic reference junction; disc sensing element (4mm diameter); electrolyte: KCl 3mol/l; free of silver ions	No	0 ... 14	0°C ... 100°C

Figure	Order number	Cell constant	Recommended measuring range	Construction	Built-in temperature sensor	Temperature range
8	PY-C01	0.5 cm <sup>-1</sup>	0.5 µS/cm ... 2,000 µS/cm	4-band conductivity cell (platinum); plastic body; outer body removable for cleaning	Yes	0°C ... 60°C
8	PY-C02	1.0 cm <sup>-1</sup>	0.01 mS/cm ... 5 mS/cm	4-band conductivity cell (platinum); plastic body; outer body removable for cleaning	Yes	0°C ... 60°C
8	PY-C03	10 cm <sup>-1</sup>	1 mS/cm ... 200 mS/cm	4-band conductivity cell (platinum); plastic body; outer body removable for cleaning	Yes	0°C ... 60°C
3	PY-PC1	1.0 cm <sup>-1</sup>	0.01 mS/cm ... 5 mS/cm pH 0 ... 14	Combination electrode, 2-band cell (platinum); pH electrode with gel-filled sealed reference electrode; temperature sensor, 12 mm diameter; 120 mm length	Yes	0°C ... 60°C

Figure	Order number	Ion	Slope	Filling solution	Measurement range in ppm	Type of electrode	Response in s	Temperature range	pH range
9	PY-101	Fluoride (F <sup>-</sup> )	-57 ± 2	KNO <sub>3</sub>	0.05 ... 500	Solid-state electrode, LaF <sub>3</sub> single crystal	95% at 1 ppm in 15 s	0°C ... 80°C	5 ... 5.5
10	PY-102	Ammonia (NH <sub>3</sub> )	57 ± 2	NH <sub>4</sub> Cl	0.02 ... 17,000	Gas-sensing electrode	95% at 1 ppm in 15 s	0°C ... 40°C	z = 1
11	PY-103	Sodium (Na <sup>+</sup> )	57 ± 2	NH <sub>4</sub> Cl	0.02 ... saturated solution	Glass membrane electrode	95% at 1 ppm in 15 s	0°C ... 80°C	9 ... 12
9	PY-104	Chloride (Cl <sup>-</sup> )	-57 ± 2	KNO <sub>3</sub>	2 ... 35,500	Solid-state electrode, Ag <sub>2</sub> S/AgCl	95% at 1 ppm in 15 s	0°C ... 60°C	2 ... 12
9	PY-105	Nitrate (NO <sub>3</sub> <sup>-</sup> )	-57 ± 2	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	0.4 ... 62,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C ... 40°C	2.5 ... 11
9	PY-106	Potassium (K <sup>+</sup> )	56 ± 2	NaCl	0.04 ... 39,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C ... 40°C	2 ... 12
9	PY-107	Calcium (Ca <sup>2+</sup> )	28 ± 2	KCl	0.2 ... 40,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C ... 40°C	2.5 ... 11
9	PY-108	Silver/sulfide (Ag <sup>+</sup> /S <sup>2-</sup> )	-28 ± 2   56 ± 2	KNO <sub>3</sub>	0, 003 ... 12,000 S <sup>2-</sup>   0.01 ... 108,000 Ag <sup>+</sup>	Solid-state electrode, Ag <sub>2</sub> S	95% at 1 ppm in 15 s	0°C ... 80°C	> 12 S <sup>2-</sup>   2 ... 8 Ag <sup>+</sup>

Figure	Order number	Recommended for...	Construction
12	PY-T01	Temperature measurement and automatic temperature compensation –	Stainless steel body; 4.7 mm diameter; 120 mm length

## Applications

● = well-suited | ○ = suitable





PB-11



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Mode

Setup

Enter

Standardize

## Basic Meter – A strong basis featuring Sartorius quality

### PB-11 laboratory pH meter

#### Proven features – proven standard

Easy, one-button calibration

Automatic temperature compensation

Electrode check showing the slope for two or three calibration-point standardization

Easy-to-understand symbols and icons for reliable readings

Simultaneous pH, temperature and buffer display

Direct reading of the measured value in mV or as a pH

#### Four buttons do it all!

Press Mode to choose between pH, absolute mV or relative mV value.

Press Standardize to automatically recognize the buffer and calibrate the system.

Use Setup and Enter to review the electrode slope or select from four groups of 16 different buffers – or view and delete calibration data.

The user-friendly prompts and messages guide you fast and reliably through laboratory routines.





PT-10



sartorius

S

4 7

7.00 pH

Mode

Setup

Standardize

Enter



## Portable Meter – “on-the-spot” measurements with Sartorius quality

### Compact design – solid performance

Be independent – with our portable pH meter, the PT-10. It's easy to operate anywhere in the field where you need accurate measurements on the spot. Its rugged design is impervious to tough conditions in nearly any environment. Of course, it features the same high quality of our standard meters. Real performance at an affordable price.

### PT-10 Portable Meter

Independent of AC line current thanks to 9 V battery operation (power supply optionally available)

Waterproof

Easy 1-key calibration of 1, 2 or 3 calibration points

Automatic buffer recognition

Automatic electrode test is run during calibration

Automatic temperature compensation

Easy-to-understand symbols and clear liquid-crystal display ensure error-free reading

Weighs only 270 g



## Specifications

	Professional Meters				Basic Meter	Portable Meter
	PP-15	PP-20	PP-25	PP-50	PB-11	PT-10
pH measurement						
Measuring range	–2.000 ... 20.000				–1.99... 19.99	0.00... 14.00
Resolution	±0.1   0.01   0.001 adjustable				±0.01	±0.01
Accuracy	±0.002				±0.005	±0.005
Calibration standards, maximum number	5				3	3
Automatic buffer recognition	26 (DIN, NIST, tech. and user-defined)				16 (DIN, NIST, tech.)	16 (DIN, NIST, tech.)
Automatic temperature compensation	×				×	×
mV measurement						
Measuring range in mV	–1,800...+1,800				–1,800...+1,800	–1,800...+1,800
Resolution in mV	1.0   0.1 adjustable				±0.1	±0.1
Accuracy in mV	±0.1				±0.2	±0.2
Temperature measurement						
Measuring range in °C	–5...+105				–5...+105	–5...+105
Resolution in °C	±0.1				±0.1	±0.1
Accuracy in °C	±0.2				±0.2	±0.3
Ion-selective analysis						
Measuring range	–	–	1.00 · 10 <sup>–9</sup> ... 9.99 · 10 <sup>9</sup>		–	–
Resolution	–	–	1, 2 or 3 digits		–	–
Accuracy	–	–	(±0.17n )%; n = ionic valence		–	–
Direct potentiometric measurement and incremental modes	–	–	×	×	–	–
Calibration standards, maximum number	–	–	7	7	–	–
Conductivity measurement						
Measuring range in µS/cm	–	0.01 ... 3 · 10 <sup>5</sup>	–	0.01 ... 3 · 10 <sup>5</sup>	–	–
Resolution in mS/cm	–	1, 2, 3 or 4 digits	–	1, 2, 3 or 4 digits	–	–
Accuracy in mS/cm	–	±0.5%	–	±0.5%	–	–
Specific electrical resistivity						
Measuring range in Ω · cm	–	30... 20 · 10 <sup>6</sup>	–	30... 20 · 10 <sup>6</sup>	–	–
Salinity						
Measuring range in ppt	–	0.01... 42.0	–	0.01... 42.0	–	–
NaCl content						
Measuring range in ppt	–	0.01... 70.0	–	0.01... 70.0	–	–
TDS (total dissolved solids)						
Measuring range in mg/l	–	0.005...150,000	–	0.005...150,000	–	–
Calibration standards, maximum number	–	5	–	5	–	–
Manual temperature entry	×	×	×	×	–	–
Slope display	×	×	×	×	×	×
Inputs for pH combination and ion-selective electrodes	BNC	BNC	2 BNC	2 BNC	BNC	BNC
2.5 mm mini phone plug						
Input for conductivity cells	–	DIN	–	DIN	–	–
Adaptation of stability parameters	×	×	×	×	–	–
Automatic calibration reminder	×	×	×	×	–	–

	Professional Meters				Basic Meter	Portable Meter
	PP-15	PP-20	PP-25	PP-50	PB-11	PT-10
Date & time stamp, non-volatile memory	×	×	×	×	–	–
GLP-compliant calibration and measured data log	×	×	×	×	–	–
Data memories	620				–	–
RS-232 C bidirectional interface	×	×	×	×	–	–
Display	Large graphical display				LCD	LCD
Power source	AC adapter				AC adapter	9-volt battery or AC adapter
Meter dimensions / mm	265 × 200 × 100				230 × 120 × 80	165 × 95 × 33
Weight	2,000 g				1,390 g	270 g including battery

## Accessories

	Order number
Printer for Professional Meters	YDP05-PH
Rolls of paper, set of 5, each with 50 m	6906937
Ink ribbon cassette	6906918
<b>pH buffers</b>	
50 capsules per pkg.; dissolve contents of each capsule in 100 ml of distilled water	
pH = 4.01 ± 0.02 at 25°C	PY-Y01
pH = 7.00 ± 0.02 at 25°C	PY-Y02
pH = 9.00 ± 0.02 at 25°C	PY-Y03
pH = 10.00 ± 0.02 at 25°C	PY-Y04
Color-coded buffer solution in a twin-neck bottle; eliminates the need for using a beaker during calibration; traceable to NIST standards	
pH = 4.00 ± 0.01 at 25°C, 500 ml	PY-Y21
pH = 7.00 ± 0.01 at 25°C, 500 ml	PY-Y22
pH = 10.00 ± 0.01 at 25°C, 500 ml	PY-Y23
<b>Storage solution</b> , for pH combination electrodes, 500 ml	PY-Y05
<b>Cleaning solution</b> , pepsin   hydrochloric acid, 500 ml	PY-Y06
<b>Electrolyte solution</b> , KCl (3 mol/l), free of silver ions, 500 ml	PY-Y07
<b>Conductivity standards, traceable to the NIST Standards</b>	
0.084 mS/cm ± 1.0% at 25°C (KCl 0.0001 mol/l), 500 ml	PY-Y10
0.147 mS/cm ± 1.0% at 25°C, (KCl 0.001 mol/l), 500 ml	PY-Y11
1.413 mS/cm ± 1.0% at 25°C, (KCl 0.01 mol/l), 500 ml	PY-Y12
12.88 mS/cm ± 1.0% at 25°C, (KCl 0.1 mol/l), 500 ml	PY-Y13



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