



Perfect
Electrochemical Analysis
Professional Meters
Basic Meters
Portable Meters
Sensors



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. Ideal features for user-friendly, reliable operation and data management.

Sartorius Basic Meters -

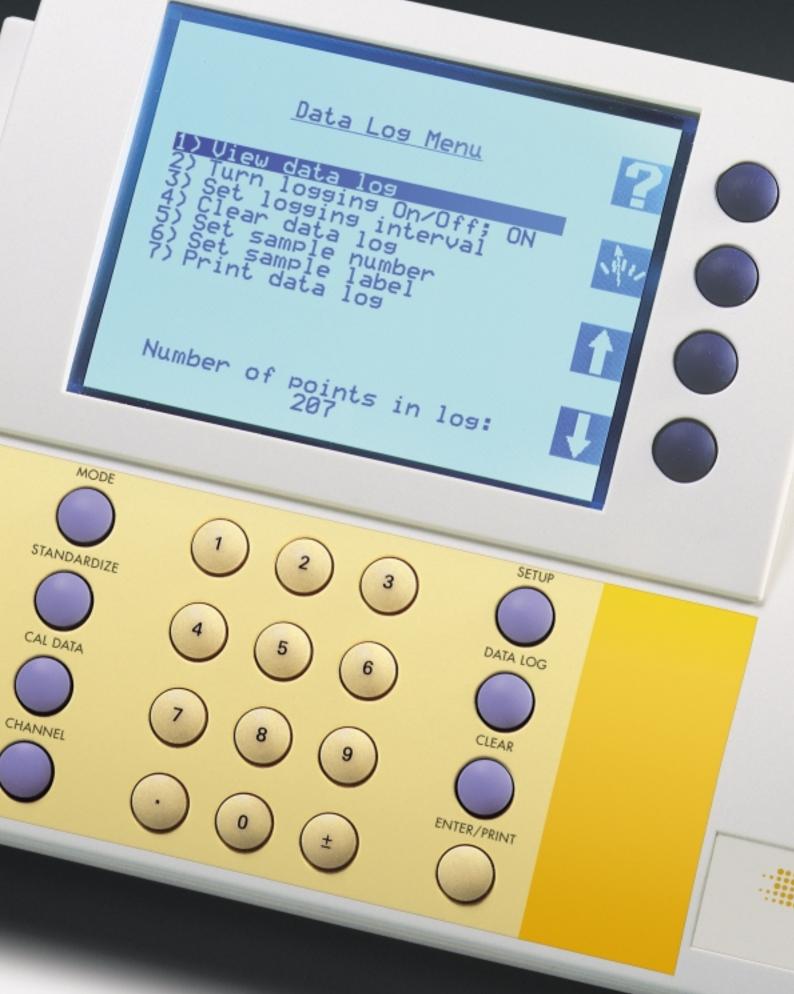
The compact, basic equipment for the highest measuring accuracy. Easy to operate for reliable results in all applications.

Sartorius Portable Meters -

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







Professional Meters – multi-talented instruments featuring Sartorius quality

 $\ensuremath{\mathsf{pH}}$ 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 ± 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







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
- Solid-state FET pH probes
- Redox electrodes
- Measurement modes: pH, mV, relative mV



 $\begin{array}{c|c} \mathsf{PP}\text{-}\mathbf{20} & \mathsf{pH} \text{ and conductivity} \\ \mathsf{meter} & \end{array}$

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.





Sensors for the highest quality measurements

H/ATC combination electrodes – glass membrane electrodes. All pH combination electrodes have an Ag/AgCI reference. The electrodes are supplied with a permanently attached cord and BNC connector; electrodes with a built-in temperature sensor (NIC 10 kΩ) additionally have a 2.5 mm phone plug

Figure Order number		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; annual 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	No	0 14	-5°C 100°C

Solid-state FET pH/ATC electrodes. The FET pH/ATC electrodes have an Aq/AqCI reference. The electrodes feature a built-in temperature sensor (NTC 10 kΩ) and are supplied with a permanently attached cord and a multi-pin DIN connector.

Figure	Order number	Construction	Built-in temperature sensor		Temperature range
7	PY-P30 for all Professional Meters	Aluminum oxide gate field effect transistor; electrode body: polycarbonate and ABS plastic	Yes	0 14	0°C 60°C
	04/ 0=+ / 00 == -		W		00

ORP combination (reday) electrodes. This type of electrode has an Ad/AdCl reference. It is supplied with a permanently attached cable and a RNC connector

Figure	Order number	Construction	Built-in temperature sensor	pH range	Temperature range
0	DV Do1	Glace body: povous openio reference junction; disc consinu element (Amm diameter); electrolyte; VCI 2mol/l; free of cities ions	Mo	0. 14	010 10010

Conductivity cells and multi-sense cell (pH, conductivity, temperature). The conductivity cells have a built-in temperature sensor (NTC 10 kΩ) and are supplied with a permanently attached cord and an 8-pin DIN connector

Figure	Order number	Cell constant	Recommended measuring range	Construction	Built-in temperature sensor	Temperature range
10	PY-C01	0.5 cm ⁻¹	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
10	PY-C02	1.0 cm ⁻¹	10 μS/cm 5,000 μS/cm	4-band conductivity cell (platinum); plastic body; outer body removable for cleaning	Yes	0°C 60°C
10	PY-C03	10 cm ⁻¹	1,000 μS/cm 200,000 μS/cm	4-band conductivity cell (platinum); plastic body; outer body removable for cleaning	Yes	0°C 60°C
3	PY-PC1	1.0 cm ⁻¹	10 μS/cm 5,000 μS/cm	Combination electrode, 2-band cell (platinum); pH electrode with gel-filled	Yes	0°C 60°C

Ion-selective pH combination electrodes. All ion-selective electrodes are combination electrodes. They are supplied with a permanently attached cord and BNC connector.

F	igure	Order number	Ion	Slope	Filling solution	Measurement range in ppm	Type of electrode	Response in s	Temperature	pH range
									range	
_										
- 3	11	PY-I01	Fluoride (F ⁻)	-57 ± 2	KNO ₃	0.05 500		95% at 1 ppm in 15 s		
1	12	PY-I02	Ammonia (NH ₃)	57 ± 2	NH ₄ CI	0.02 17,000	Gas-sensing electrode	95% at 1 ppm in 15 s		
1	13	PY-I03	Sodium (Na+)	57 ± 2	NH ₄ CI	0.02 saturated solution	Glass membrane electrode	95% at 1 ppm in 15 s	0°C 80°C	9 12
1	11	PY-I04	Chloride (CI ⁻)	-57 ± 2	KNO ₃	1.8 35,500	Solid-state electrode, Ag ₂ S/AgCl	95% at 1 ppm in 15 s	0°C 60°C	2 12
1	11	PY-I05	Nitrate (NO ₃ -)	-57 ± 2	(NH _a) ₂ SO ₄	0.4 62,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C 40°C	2.5 11
1	11	PY-I06	Potassium (K+)	56 ± 2	NaCl	0.04 39,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C 40°C	2 12
1	n	PY-I07	Calcium (Ca ²⁺)	28 ± 2	KCI	0,2 40,000	Polymer matrix electrode	95% at 1 ppm in 15 s	0°C 40°C	2.5 11
- 7	11	PY-Ins	Silver(sulfide (An+/S2-)	-28 ± 2 56 ± 2	KNO	0.003 32.000 S2- 0.01 108.000 An+	Solid-state electrode An S	95% at 1 nnm in 15 c	U.C 8U.C	> 12 S2- 2 R An+

 $\textbf{Temperature compensating probe. NTC 10 k} \Omega \text{ stainless steel sensor with permanently attached cord and a 2.5 mm phone plug.}$

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

Applications

• •																							
	pН						nH						pH						nH				
	pr pr Conductivity Conductivity		Redox		hii				Conductivity Conductivity				Redox										
											potential												pote
	PY-P10												PY-P10										
	PY-P12	PY-P11				PY-P30*							PY-P12	PY-P11				PY-P30*					
	PY-P20	PY-P21	PY-P22	PY-P23	PY-P24	PY-P31*	PY-PC1	PY-C02	PY-C03	PY-CO1	PY-R01		PY-P20	PY-P21	PY-P22	PY-P23	PY-P24	PY-P31*	PY-PC1	PY-C02	PY-C03	PY-CO1	PY-R01
Agar-agar gel				•								Oil/water emulsions					•						
Aggressive water		•			•						0	ORP measurements											•
Ammonia solutions		0			•							Paint (water-based)		•			•	0	0	0			
Aquarium water	•	•			0	•	0	0	0			Paper				•	•						
Beer		•			0	•	•	•				Paper extract		•			0	0	•	•			
Beverages	0	•			0	•	0	0		0	0	Partially aqueous media		•			0						٥
Bleach, bleaching lye		•			0						•	Photoresists	0	•				0					0
Boiler feed water		•			•	0	0	0		•		Plants				0							
Brine		•			0	•	0	0	•			Precision measurements		•			•		0	0		0	
Cheese				0		0						Protein solutions		•			0	•	•	•		٥	
Coffee extract		•			0	•	•	•				Rain water		•			•	0	0	٥		•	
Condensate		•			•	0				•		Reagent-grade water		•			•	0				•	
osmetics		•			•	0						Saliva			•			0					
ream		•			•	•						Salt solution		•			0	•	0	0	•		
ulture media, solid			•	•								Sausage (incl. cold cuts, deli m	eat)			0							
yanite detoxification		•			0	•	•	•			•	Sea water		•			•	0	0	0	•		
Desalting/ion exchange		•			•					•		Serum		•	•		0	0	•	•			
lisinfectants		•			0	•	•	•			•	Shampoo		•			0		•	•			
ispersion paints		0			•	•	0	0				Skin				•							
Distilled water		•			•	•				•		Soap solution		•			0		•	•			
rinking water		•				0	•	•			0	Soft drinks		•			0	0	•	•			
Oye (water-based)		•			•	0	0	0				Soil suspension	0	•				0					
lectroplating bath		•			0						•	Sulfidic liquid		0			•						
nvironmental analyses		•			0	0	•	•		•		Surface measurements				•							
xtreme pHs		0			•							Surface water	0	•			0	•	•	•			
at		0		0	•	0						Suspensions, water-based		0					0	•			
ield measurements	•	0				0	0	0				Swimming pool water					•			0			
ixing bath		•			0	•					0	Titration		•			0		0	٥			0
ruit				0								Tris buffer		•			0	0					
ruit juice		•				•	0	0			0	Vegetable juice		•			0	•	0	٥			0
round water		•			•	•	0	0				Vegetables				0							0
ligh organic content		0										Waste water concentrate	0	•			•	0	•				0
lousehold cleaning agents		•			0	0					0	Waste water from											
/s		•			0	0	•	•				electroplating baths		0			0						
jeldal distillation		•			0	0						Waste water, general	•	•			0	•	0	0			0
ather												Waste water, low in ionic cont	ent •	•					0	٥			0
quid fertilizers		•			0	•	•	•				Water for industrial use	0	•				•		•			0
quids containing proteins		•					0	0				Water used for cooling	0				0	0					
ow sample quantity						0						Water, general	0	•			0	0					
farmelade		•			0	0						Water-based emulsions		•			•	•	•	•		0	
Media low in ions		•			•							Wine		•			0	•					
Milk		•				0						Yogurt		•				•					
Mineral water		•			0		•					Tooth paste				0							

= well-suited | = suitable | **PY-P30 and PY-P31 are glass-free electrodes for measurements in food production





sartorius

% slope QQS
Good Electrode
4 7

pH/mV STANDARDIZE SETUP

Basic Meter - A strong basis featuring Sartorius quality

PB-20 laboratory pH meter Proven features – proven standard

Easy, one-button calibration

Automatic temperature compensation

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

Connectors for FET (Field Effect Transistor) pH probes and glass-membrane pH electrodes

Four buttons do it all!

Press pH/mV to choose between pH, absolute mV or relative mV mode.

Press Standardize to automatically recognize the buffer.

Enter up to three calibration points for greater accuracy! Use Setup and Enter to review the electrode slope or select from four groups of 22 different buffers – or delete calibration data.

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







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 in conformance with IP 67

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 Met	ers			Basic Meter	Portable Meter
	PP-15	PP-20	PP-25	PP-50	PB-20	PT-10
pH measurement						
Measuring range	-2.000 20.000				-1.9919.99	0.0014.00
Resolution	±0.1 0.01 0.00	1 adiustable			±0.01	±0.01
Accuracy	±0.002	T adjustable			±0.005	±0.005
Calibration standards,	10.002				± 0.003	10.003
maximum number	5				3	3
Automatic buffer recognition	26 (DIN, NIST, tech. a	nd user-defined)			22 (NIST, tech.)	16 (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 adjustabl	e			±0.1	±0.1
Accuracy in mV	±0.1				±0.3	±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	±0.3				±0.4	±0.3
Ion-selective analysis						
Measuring range	_	_	1.00 · 10 ⁻⁹	9.99 · 10 ⁹	_	_
Resolution	_	_	1, 2 or 3 digi	ts	_	_
Accuracy	-	-	(±0.17n)%; n = ionic val		-	-
Direct potentiometric measurement and incremental modes	-	-	×	×	-	-
Calibration standards, maximum number	-	-	7	7	-	-
Conductivity measurement						
Measuring range in μS/cm	-	0.01 3 · 10 ⁵	-	0.01 3 · 10 ⁵	_	-
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 $\Omega \cdot cm$	-	3020 · 10 ⁶	-	3020 · 10 ⁶	-	-
Salinity						
Measuring range in ppt	-	0.0142.0	-	0.0142.0	-	-
NaCl content						
Measuring range in ppt	-	0.0170.0	-	0.0170.0	-	-
TDS (total dissolved solids)						
Measuring range in mg/l	-	0.005150,000	-	0.005150,000	-	-
Calibration standards, maximum number	-	5	_	5	-	-
Manual temperature entry	×	×	×	X	-	-
Slope display	×	×	×	X	×	×
Inputs for pH combination and ion-selective electrodes	BNC	BNC	2 BNC	2 BNC	BNC	BNC
Mini DIN for pH FET	X	X	×	X	×	
Input for conductivity cells	-	DIN	-	DIN	-	-
Adaptation of stability parameters	×	X	×	X	-	-
Automatic calibration reminder	×	×	×	×	-	_

	Professional	Meters			Basic Meter	Portable Meter
	PP-15	PP-20	PP-25	PP-50	PB-20	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 graphic	al display			LCD	LCD
Type of protection	-	-	-	_	-	IP 67
Power source	AC adapter				AC adapter	9-volt battery or AC adapter
Meter dimensions / mm	265 × 200 × 1	00			230×120×80	165 × 95 × 33
Weight	2,000 g				1,390 g	270 g including battery

Accessories

Accessories	Order number
Printer for Professional Meters	YDP05-PH
Rolls of paper, set of 5, each with 50 m	6906937
Ink ribbon cassette	6906918
pH buffers	
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
Storage solution, for pH combination electrodes, 500 ml	PY-Y05
Cleaning solution, pepsin/hydrochloric acid, 500 ml	PY-Y06
Electrolyte solution, KCl (3 mol/l), free of silver ions, 500 ml	PY-Y07
Conductivity standards, traceable to the NIST Standards	
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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