

# Portable pH meters with GLP functions

## handylab pH 11 and handylab pH 12

These pocket-size meters in shock-proof, water-tight casings are ideally suited for field work.

### Measurement parameters

The pH, mV and °C measurement parameters mean that the pocket pH meters from SCHOTT Instruments have a variety of uses.

### Measurement memory and interface

In comparison with the handylab pH 11, the handylab pH 12 additionally has a data memory, which makes it possible to save measurements manually or automatically using a timer control, and then evaluate them at a later time. Furthermore, this pH meter has a configurable interface with a recognition function (RS 232) so that it can be connected to a computer (bidirectional) or a recorder.

### Measurement reliability

The special AutoRead function, which can be additionally activated, serves to monitor the drift of the combination electrode. The measured value is only released when the stability criteria are fulfilled. This ensures the reproducibility of measurement results.

### Temperature compensation

Measurements can be performed with and without the temperature sensor. Temperature compensation of pH measurements can be effected automatically or manually. The type of temperature sensor that is connected (Pt1000 or NTC 30) is recognized automatically.

### Calibration

The first option is a fully automatic one to three point calibration using buffers that have already been programmed into the meter in accordance with DIN or technical buffers from SCHOTT Instruments. The meter recognizes the buffer solutions automatically. Alternatively, conventional calibration with optionally selectable buffers can also be used. A sensor symbol indicates the status of the pH combination electrode after the automatic calibration. The adjustable calibration timer of the handylab pH 12 can be set to remind the user of any calibration that is due to be performed.

### Power supply

The battery-powered meters allow the user to work independently of a mains power supply for thousands of hours. When the batteries are changed, all of the calibration data are retained in the memory. A message appears on the display in good time to remind the user to replace the batteries. An optional power pack is also available for the handylab pH 12.



### Sensors

We have a comprehensive product range of precision pH electrodes and can offer you the right sensor for every type of application. We would be pleased to advise you about your specific application.

### Separately or as a set

The handylab pH 11 and handylab pH 12 pocket-size pH meters are not only available separately, but can also be purchased in a complete cost-effective set that includes a combination electrode, buffer solutions and measuring beakers in a carrying case. With this set, you can get to work right away.

# Technical data

## handylab pH 11, handylab pH 12

ph meters		handylab pH 11	handylab pH 12
<b>Measuring ranges</b>			
pH	range	-2.000...+19.999 pH	-2.000...+19.999 pH
	resolution max.	0.001 pH	0.001 pH
	accuracy	+0.005/±0.01 pH	+0.005/±0.01 pH
mV	range max.	-1999...+1999 mV	-1999...+1999 mV
	resolution max.	0.1 mV	0.1 mV
	accuracy	+0.3/±1 mV	+0.3/±1 mV
temperature	range	-5.0...+105.0 °C	-5.0...+105.0 °C
	resolution	0.1 K	0.1 K
	accuracy (with NTC 30)	±0.1 K	±0.1 K
	manual adjustment	-20...+130 °C	-20...+130 °C
drift control	can be switched off	yes	yes
slope matching		85...105 %	85...105 %
zero point matching		± 30 mV	± 30 mV
sensor evaluation	via symbol in the display	yes	yes
input resistance		>10 <sup>12</sup> Ω	>10 <sup>12</sup> Ω
offset current		< 10 <sup>12</sup> A	< 10 <sup>12</sup> A
<b>Calibration</b>			
buffer sets	DIN (1.68/4.01/6.87/9.18)	1-/2-/3 point	1-/2-/3 point
	technical (2.00/4.00/7.00/10.01)*	1-/2-/3 point	1-/2-/3 point
	selectable buffers	1-/2 point	1-/2 point
calibration interval control		-	1...999 days
saving calibration data in memory		-	yes
Real time clock	integrated with time/date	-	yes
<b>Data storage</b>			
storage by depression of key		-	800 data records
time controlled storage	in 7 intervals (5 sec. ...60 min)	-	800 data records
<b>Connections</b>			
electrode (socket in accord. with DIN 19 262)		yes	yes
temperature sensor (NTC 30/Pt 1000, 2 x 4 mm banana plug)		yes	yes
<b>Interface</b>			
for analogue recorder cable Z 394		-	4 poles socket
for RS-232 cable Z 395, bi-directional		-	4 poles socket
<b>Ambient temperature</b>			
operating temperature		-10...+55 °C	-10...+55 °C
relative humidity (annual average)		< 90 %	< 90 %
<b>Power supply</b>			
battery operated (type AA)		4 x 1.5 V mignon cells	4 x 1.5 V mignon cells
battery life time (data is saved even if batteries are changed)		approx. 5.000 h	approx. 5.000 h
power supply (no akku)		-	optionally
automatic switch-off during battery operation		60 min	60 min
<b>Housing</b>			
dimensions (H x W x D)		172 mm x 80 mm x 37 mm	172 mm x 80 mm x 37 mm
weight		approx. 0.3 kg	approx. 0.3 kg
<b>Display</b>			
LCD multi-function display		60 mm x 45 mm	60 mm x 45 mm
<b>Instrument safety</b>	protection class	3, EN 61010-1 A2	3, EN 61010-1 A2
	protection type	IP 66, EN 60529	IP 66, EN 60529
approvals/marks of conformity		cETLus, CE	cETLus, CE
instrument warranty		3 years	3 years

\* SCHOTT Instruments