

# Multi-parameter portable meters with GLP functions

## handylab pH/LF 12 and handylab multi 12

The multi-parameter pocket-size meters – handylab pH/LF 12 and handylab multi 12 – in shock-proof, water-tight casings are ideally suited for field work.

### Measurement parameters

The measurement parameters pH, redox potential, temperature and conductivity means that the handylab pH/LF 12 has a variety of uses. The handylab multi 12 can also be used to measure the oxygen concentration in solutions.

### Measurement memory and interface

The meters have a data memory, which means that measurements can be saved manually or automatically by using a timer control, and evaluated later on. Both meters have a serial RS-232 interface (bi-directional) for data transfer purposes.

### 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.

### Calibration

For calibration of the pH measurement, there is a one or two point calibration with technical buffers. For calibration of the conductivity sensor and the oxygen sensor, if needed, there is an automatic

calibration function. After automatic calibration, a sensor symbol indicates the status of the calibrated sensor. The adjustable calibration timer can remind the user that calibration is due to be performed.

### Power supply

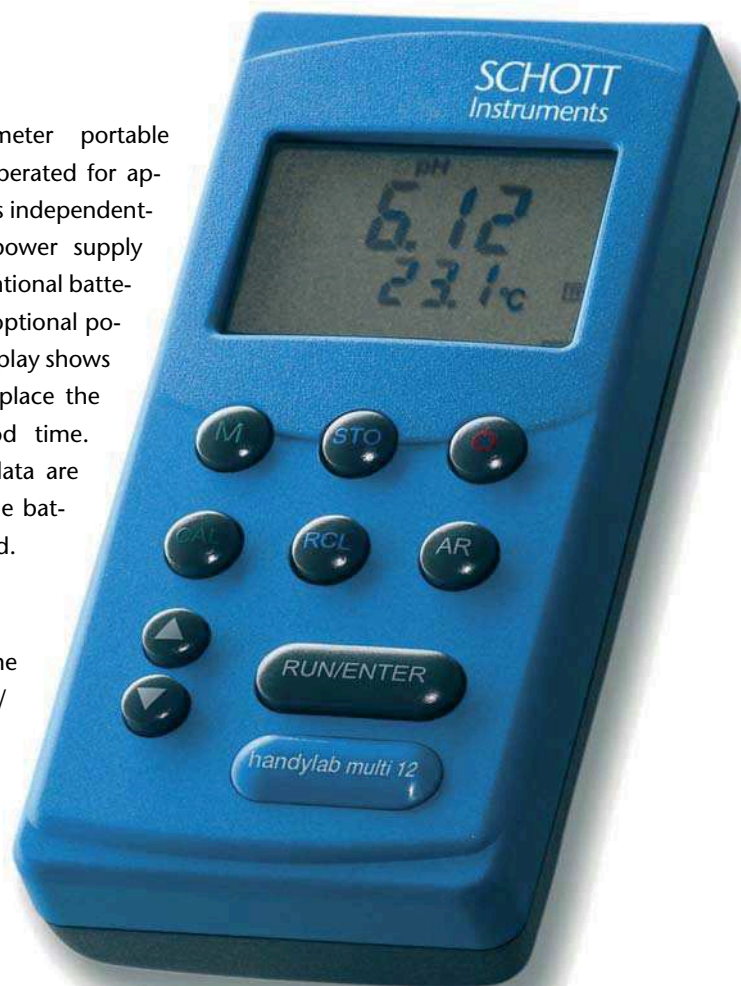
The multi-parameter portable meters can be operated for approx. 2,500 hours independently of a mains power supply using four conventional batteries, or with the optional power pack. The display shows a reminder to replace the batteries in good time. The calibration data are retained when the batteries are changed.

### Sensors

We supply the handylab pH/LF12 complete with a suitable pH combination electrode and conductivity sensor. The handylab multi 12 additionally includes an oxygen sensor.

### As a set

The handylab pH/LF 12 and handylab multi 12 multi-parameter meters are available as a complete set in a carrying case with all of the requisite sensors, calibration and maintenance accessories. With the set, you can get to work immediately.



handylab

# Technical data

## handylab pH/LF 12, handylab multi 12

Parameters		handylab pH/LF 12	handylab multi 12
<b>Measuring ranges</b>			
pH/mV	pH range/resolution	-2.00...+19.99 pH	-2.00...+19.99 pH
	accuracy (±1 digit)	±0.01 pH	±0.01 pH
	mV range/resolution	-1999...+1999 mV	-1999...+1999 mV
	accuracy (±1 digit)	±1 mV	±1 mV
temperature	measuring range	-5.0...+105.0 °C	-5.0...+105.0 °C
	manual setting	-20...+130 °C	-20...+130 °C
oxygen	concentration: ranges/resolution	-	0.00...19.99 mg/l/0...90.0 mg/l
	saturation: ranges/resolution	-	0.00...199.9 %/0.0...600 %
	accuracy (±1 digit)	-	±0.5 % of measured value
	temp. compensation, automatically	-	0.0...50.0 °C
conductivity	4 ranges/Auto range	1 µS/cm...500 mS/cm	1 µS/cm...500 mS/cm
	salinity acc. to IOT table	0.0...70.0	0.0...70.0
	accuracy (±1 digit)	±0.5 % of measured value	±0.5 % of measured value
	temperature compensation modes	linear, nonlinear, no compensation	nonlinear
	cell constant, calibrate	0.450...0.500	0.450...0.500
drift control	deactivatable	yes	yes
sensor evaluation	by symbol on display	yes	yes
<b>Calibration</b>			
pH	technical (2.00/4.00/7.00/10.01) <sup>*)</sup>	1-/2-point	1-/2-point
	DIN (1.68/4.01/6.87/9.18)	1-/2-point	-
oxygen	automatic calibration	-	yes
conductivity	automatic calibration	yes	yes
calibration interval control		1...999 days	1...999 days
calibration data store		yes	yes
real time clock	integrated with time/date	yes	yes
<b>Serial interface</b>			
type		RS 232, bi-directional	RS 232, bi-directional
baud rate		adjustable	adjustable
<b>Data storage</b>			
storage by depression of key		500 data records	500 data records
time controlled storage	in 7 levels (5 sec...60 min)	500 data records	500 data records
<b>Input</b>			
pH/redox-electrode (opt. with temperature sensor)		socket acc. to DIN 19262 + socket 4 mm	socket acc. to DIN 19262 + socket 4 mm
conductivity/oxygen sensor		8 pole socket	8 pole socket
<b>Output</b>			
for RS-232 cable Z 395, bi-directional		4 pole socket	4 pole socket
for recorder cable Z 394		4 pole socket	4 pole 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		4 x 1.5 V mignon cells (type AA)	4 x 1.5 V mignon cells (type AA)
battery life time (data remain when changing batteries)		approx. 2,500 h	approx. 2,500 h
automatic switch off at battery operation		60 min	60 min
power supply (no akku)		optionally	optionally
<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	3, EN 61010-1
	protection type	IP 66, EN 60529	IP 66, EN 60529
approvals/marks of conformity		cETLus, CE	cETLus, CE
instrument warranty		3 years	3 years

<sup>\*)</sup> SCHOTT Instruments