

## SOIL CHEMICAL TESTS

### WS 3500 TO WS 3508 pH Determination

#### DIP pH SENSORS AND TESTER STICK METERS, HANNA

Simple to use dip sensors for routine pH measurements, Digital display, Waterproof, Long-life battery, Integral electrode with protective cap, Pocket clip.

#### SPECIFICATIONS

**RANGE** : 0 to 14 pH **RESOLUTION** : 0.1 pH **ACCURACY** :  $\pm 0.1$  pH (0.2 pH on pHep 1) **OPERATING TEMPERATURE** : 0 to 50 °C **POWER** : 4 x 1.4V mercury cells (Durable MP675 H or equivalent) **OVERALL (l x w x h)** : 148 x 28 x 15 mm **ELECTRODE** : Combination with epoxy body and integral temperature sensor **pH u-Sensors**. As described. With electrode and battery.

**Model : WS 3500 (pHep 1), Model : WS 3501 (pHep 2)**. With automatic temperature, **Model : WS 3502 (Micro pHep 3)**. With automatic temperature calibration.

**WS 6003 Dip pH Tester, Checker 1** A low cost, advanced pH tester with replaceable electrode. Range pH 0.00 to 14.00 with 0.01 pH resolution and  $\pm 0.2$  pH accuracy. Two point calibration at pH 4/10 and pH 7 using offset and slope screw trimmers. Powered by 2 x 1.4 V (Duracell MP675H or equivalent) batteries giving up to 3000 hours operation. Supplied with screw-in general purpose combination electrode and batteries. **Spare electrode** - For use with Checker 1, screw in type.

**PICCOLO, HANNA** Portable hand-held meters with detachable electrode, Digital display, Long-life battery, Integral procted electrode which can be detached and replaced, Automatic temperature compensation, Dual range pH/temperature model (Piccolo plus Electrode length 160 mm).

#### SPECIFICATIONS

**RANGE** : 1 to 13 pH, 0 to 70 °C **RESOLUTION** : 0.01 pH, 1 °C **ACCURACY** :  $\pm 0.01$  pH,  $\pm 1$  °C **TEMPERATURE COMPENSATION** : Auto 0 to 70 °C **POWER** : 4 x 1.4V mercury cells (Durable MP675H or equivalent) **OVERALL (lxwxh)** : 172x29x15 mm, Piccolo 1 compensation, 50x30x15 mm Piccolo 2/Piccolo plus, Piccolo plus only **pH Meter. Piccolo** As described with electrode, pH 4 and pH 7 buffers and battery. In carrying case. **Model : WS 3504 (Piccolo 1)** Electrode length 90 mm, **Model : WS 3505 (Piccolo 2)** Electrode length 160 mm, **Model : WS 3506 (Piccolo plus)** Electrode length 160 mm

#### THE IDEAL pH/mV METER FOR EDUCATION, HANNA

**WS 3507 (HI8014)** Measurements can be performed for both pH and REDOX (reduction/oxidation potential) with manual temperature compensation. Calibration is simple and will remain valid even after the meter if turned off. Offers a wide selection of screw type pH and ORP electrodes to be used with HI 8014 (see electrode section). Supplied c/w an HI 1312S unbreakable, plastic body, double junction combination, pH electrode.

#### SPECIFICATIONS

**RANGE** : 0.00 to 14.00 pH & 0 to 1999 mV **RESOLUTION** : 0.01 pH & 1 mV **ACCURACY** :  $\pm 0.01$  pH &  $\pm 1$  mV **TEMPERATURE COMPENSATION** : Manual from 0 to 100 °C **INPUT IMPEDANCE** : 10 ohms **BATTERY TYPE** : 1 X 9 VOLT **LIFE** : 100 hrs of continuous use **DIMENSION** : 180x83x40 mm **WEIGHT** : 280 g instrument alone 520 g complete with electrode **ELECTRODE** : HI 1312S plastic body, combination, double junction, refillable pH electrode (included) **ENVIRONMENT** : 0 to 50 °C ; 95 % RH



## SOIL CHEMICAL TESTS

### WS 3509 TO WS 3513/2 pH Determination & Soil Colour/Organic Matter

#### MICROPROCESSOR, ATC, BENCH pH METERS IDEAL for Q.C. HANNA

Able to perform pH, ORP, ISE and temperature measurements with high accuracy and fast response. mV measurements automatically switch from ISE to ORP when the reading reaches 400 mV. Temperature effects are automatically compensated for, from 0 to 100 deg. C or can be manually compensated for, on the control panel in the same range. The meter has three memorized buffer values, ( 4.01, 7.01, 10.01 ) and automatic buffer recognition to avoid errors during calibration. HI 8520 has all the same features of HI 8521, but without the mV range.

| MODELS SPECIFICATIONS           | WS 3509<br>HI 8520  | WS 3510<br>HI 8521          |
|---------------------------------|---|-----------------------------|
| <b>RANGE</b>                    |   |                             |
| pH                              | 0.00 TO 14.00 pH  | 0.00 to 14.00 pH            |
| mV (ISE)                        | ± 399.9 mV  | ± 399.9 mV                  |
| mV (ORP)                        | ± 1999 mV   | ± 1999 mV                   |
| temp                            | 0.0 to 100 °C   | 0.0 to 100 °C               |
| <b>RESOLUTION</b>               |   |                             |
| pH                              | 0.01 pH   | 0.01 pH                     |
| mV                              | -----   | 0.1 mV (ISE), 1 mV (ORP)    |
| temp                            | 0.1 °C  | 0.1 °C                      |
| <b>ACCURACY</b>                 |   |                             |
| pH                              | ± 0.01 pH   | ± 0.01 pH                   |
| mV                              | -----   | ± 0.02 mV (ISE), 1 mV (ORP) |
| temp                            | ± 0.4 deg. C  | ± 0.4 deg. C                |
| <b>CALIBRATION</b>              | Automatic 2 point with auto-buffer recognition  |                             |
| <b>TEMPERATURE COMPENSATION</b> | Automatic or manual from 0 to 100 °C  |                             |
| <b>INPUT IMPEDANCE</b>          | 0 to 50 °C ; 95 % RH POWER 240/220V ± % 15; 50/60 Hz; MAX power 10 W  |                             |
| <b>DIMENSIONS</b>               | 230 x 170 x 70 mm   | <b>WEIGHT</b> 1 kg          |
|                                 | <b>ELECTRODE &amp; TEMPERATURE PROBE HI 1332B</b> , plastic body combination pH electrode (included) 0.00 to 14.00 pH <b>HI 7669/2</b> : Temperature Probe (included) |                             |

#### Organic Impurities in Fine Aggregate ASTM C40

If aggregate contains organic impurities it may not be suitable for inclusion in concrete. Organic impurities, usually tannic acid and its derivatives may interfere with the chemical reactions of hydration. Impurities are more likely to be found in fine (sand) aggregate.

**WS 3511 Colour Standard**, with five organic colour transparencies mounted in a holder.

**Soil Colour Chart** A standard identification of colour is an essential component of a soil-profile description. Soil colour charts are used widely.

#### WS 3512 Soil Colour chart

The set consists of 7 constant hue charts on a neutral grey chart stock. Apertures cut between adjacent colours facilitate viewing so that the soil sample may be evaluated directly against the standard colours. Included in the set is Gley Colour Chart for submerged soil. This displays 28 matt colour chips, weak chromas and neutrals on value level 4 to 7 for hues, 6GY, 5G, 5BG and 5B. Charts, diagrams and interleaves are fitted into a pocket-sized loose leaf binder. Weight 910g.

#### WS 3513 Tropical Soil Colour Chart.

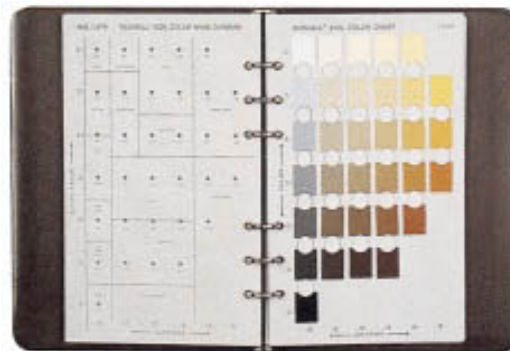
Set of 2 for use with reddish tropical soils. The charts fit into the binder supplied with WS 6012.

#### Determination of Shell Content BS 812

The purpose of this test is for determination of the increasing use of aggregate containing shell. The BS 812 described that the method for determination the shell content of coarse aggregate, involving handpicking.

**WS 3513/1** Plate, dark grey, 500 mm square. For the determination of shell content of coarse aggregate to BS 812. Weight 9.1 kg.

**WS 3513/2** Dropping bottle, clear glass, 125 ml capacity for the determination of shell content of fine aggregate. Weight 20 g.



## SOIL CHEMICAL TESTS

### WS 3514 to WS 3515/1 pH determination, sulphate content determination & Colorimetric pH method

#### WS 3514

##### LA MOTTE-HESTER OUTFIT

Contained in a shockproof carrying case. In order to perform the test, prepare a solution of the sample to check, using barium sulphate.

By means of a wide range indicator, carry out a first approximate analysis, in order to the most suitable indicator.

After that, determine the pH, by comparison with the indicator previously chosen.

Measuring range : 4 to 8 pH

Readout : 0, 2 pH

Dimensions : 500 x 350 x 250 mm

Weight : 4 kg.

##### Colorimetric pH method. ASTM D 1067

The describe method use chemical indicators to prepare solutions in the field to determine the pH value by colour comparisons. The equipment is supplied with colour chart providing colour references in steps of 0.5 pH.

#### WS 3514/1

BDH Soil Testing Outfit, pH determination by colorimetric method comprising :

- 1 tube cleaning brush
- 2 12 test tubes with rubber bungs
- 3 1 bottle of barium sulphate (100g)
- 4 1 bottle of soil indicator (100ml)
- 5 1 bottle of distilled water (500ml)
- 6 1 spatula
- 7 1 colour chart, range 4.0 to 8.0 pH in 0.5 pH steps.
- 8 Complete carrying case and integral test tube rack. All weight 2.6 kg.



WS 3514



WS 3514/1

#### WS 3515

**ION EXCHANGE APPARATUS**, BS 1377. Suitable for determining the sulphate content in aqueous soil samples.

It consists of an ion exchange column and constant head device, assembled on a rigid panel.

Dimensions : 200 x 100 x 600 mm

Weight : approx. 3 kg.

#### WS 3515/1

**RESIN**, standard IR 120 Amberlite.

Pack of 1.

**WS 3515/2 Litmus paper, red**

**WS 3515/3 Litmus paper, blue**

**WS 3515/4 Litmus paper, neutral**

**WS 3515/5 pH test paper**

**WS 3515/6 Buffer tablets, pH 4**

**WS 3515/7 Buffer tablets, pH 7**

**WS 3515/8 Buffer tablets, pH 9.2**

