# SECTION 6

## INDEX



## ECOLOGY

**SUPPLIED ITEMS**

| | |
|---|---|
| 1 | Beaker, 250 ml |
| 1 | Bended tube with plug |
| 1 | Flask, 100 ml |
| 1 | Pencil dropper |
| 1 | Tripod support |
| 2 | Candles with candles-holder |
| 1 | Funnel |
| 1 | Agitator |
| 20 | Paper discs |
| 1 | Plexiglas plate with stem |
| 1 | Plastic bag |
| 1 | Spoon |
| 3 | Samples with known pH |
| 1 | Cylinder, 100 ml |
| 1 | Seeds sachet |
| 3 | Small vases for culture |
| 1 | Syringe with tube |
| 1 | pH indicator, 1-10 |
| 3 | Petri dishes |
| 3 | Test-tubes with plug |
| 3 | Jars with plug |
| 1 | Alcohol burner |
| 1 | Flame-scattering grid |
| 1 | Bottle of denatured alcohol |
| 1 | Bottle of clay |
| 1 | Bottle of water lime |
| 1 | Bottle of chloride acid, 10% sol. |
| 1 | Bottle of sodium chloride |
| 1 | Bottle of sodium hydrate |
| 1 | Bottle of gravel |
| 1 | Bottle of sand |
| 1 | Bottle of chloroform |
| 1 | Bottle of barium chloride, 10% solution |
| 1 | Bottle of methylene blue |
| 1 | Bottle of Griess reagent |
| 1 | Bottle of Nessler reagent |
| 1 | Bottle of humus |
| 1 | Experiments guide |
| 1 | Case |

## 5676 MAN AND ENVIRONMENT

**23 experiments**

CONTENTS

1. The soil - Mineral and organic fraction
2. Porosity of the soil
3. Acidity of the soil
4. The carbonates in the soil
5. The agricultural soil
6. Water cycle
7. Drinking water
8. Water pollution
9. Search for pollutants
10. Atmosphere
11. Air pollutants
12. Acid rain
13. Greenhouse effect

5676

Basic and intermediate level

**SUPPLIED ITEMS**

| | |
|---|---|
| 1 | Beaker, 100 ml |
| 1 | Beaker, 400 ml |
| 1 | Thermometer, -10 +110OC |
| 1 | Tripod support |
| 1 | Flask, 250 ml |
| 1 | Pencil dropper |
| 1 | Alcohol burner |
| 1 | Flame-scattering grid |
| 3 | Candles with candles-holder |
| 1 | Pocket microscope, 60x-100x |
| 1 | Glass bended tube with tap |
| 10 | Filter paper discs |
| 1 | Plexiglas plate with stem |
| 1 | Water collector |
| 1 | Agitator |
| 1 | Funnel |
| 1 | Breathed |
| 1 | Aquarium |
| 1 | Plastic bag |
| 1 | Spoon |
| 1 | Seeds sachets |
| 3 | Small vases for cultures |
| 1 | Enlarger, 7x |
| 1 | Fan with support |
| 1 | Aereator with tube |
| 2 | Syringes with tube |
| 1 | Gauze |
| 1 | pH Indicator, 1-10 |
| 3 | Samples of known pH |
| 1 | pH-meter for soil |
| 1 | Graduated cylinder, 500 ml |
| 1 | Pack of samples-holder slides |
| 1 | Pack of samples-cover slides |
| 10 | Petri dishes |
| 5 | Test-tubes with plug |
| 5 | Jars with plug |
| 1 | Test-tubes holder |
| 1 | Vacuum pipettes |
| 1 | Bottle with plug |
| 1 | Bottle of clay |
| 1 | Bottle of gravel |
| 1 | Bottle of water lime |
| 1 | Bottle of sodium chloride |
| 1 | Bottle of denatured alcohol |
| 1 | Bottle of chloride acid, 10%sol. |
| 1 | Bottle of methylene blue |
| 1 | Bottle of sodium hydrate |
| 1 | Bottle of Griess reagent |
| 1 | Bottle of Nessler reagent |
| 1 | Bottle of Chloroform |
| 1 | Bottle of barium chloride, 10% sol. |
| 1 | Bottle of sand |
| 1 | Bottle of humus |
| 1 | Experiments guide |
| 2 | Small cases |

A scale not included in the kit is necessary.

## 5632 ECOLOGY

**30 experiments**

CONTENTS

1. The soil - mineral and organic fraction
2. Soil porosity
3. Soil acidity
4. Soil carbonates
5. Agricultural soil
6. The habitat - life in the soil
7. Water cycle
8. The habitat - life in the water
9. Drinking water and its distribution
10. Water pollution
11. Research of the main pollutants
12. Biological indicators
13. The atmosphere
14. Air pollutants
15. Acid rains
16. Greenhouse effect
17. Atmospheric dust
18. Smog and thermal inversion

Advanced level

5632

## 7021 WATER ANALYSIS KIT

**11 experiments**


7021

CONTENTS

1. Water cycle; rain and rain gauge
2. Drinking water and its distribution; water pollution
3. Biodegradable waste
4. The detection of ammonia
5. The detection of nitrites
6. The detection of sulfates
7. The detection of surfactants
8. Biological indicators
9. Water acidity
10. Use of the universal indicator
11. Use of the pH meter
12. Acid rain

**SUPPLIED ITEMS**

| | |
|---|---|
| 1 Beaker, 250 ml | 5 Petri dishes |
| 1 Pencil dropper | 5 Test-tubes with plug |
| 1 Enlarger, 7x | 1 Bottle of methylene blue |
| 1 Funnel | 1 Bottle of sodium hydrate |
| 1 Agitator | 1 Bottle of Griess reagent |
| 1 Water collector | 1 Bottle of Nessler reagent |
| 1 Graduated cylinder 100 ml | 1 Bottle chloride acid, 10% sol. |
| 2 Syringes with tube | 1 Bottle of chloroform |
| 1 pH indicator, 1-10 | 1 Bottle of barium chloride, 10% sol. |
| 3 Solution of known pH | 1 Experiments guide |
| 1 pH meter for soil | 1 Small case |

## 7022 SOIL ANALYSIS KIT

**13 analysis**


7022

CONTENTS

1. The soil
2. Mineral and organical fraction
3. Soil porosity
4. Soil permeability
5. Soil acidity
6. Soil carbonates
7. Soil ammonia
8. Soil nitrites
9. Soil sulphates
10. Soil surfactants
11. Biodegradability

**SUPPLIED ITEMS**

| | |
|---|---|
| 1 Beaker, 250 ml | 5 Test-tubes with plug |
| 1 Pencil dropper | 5 Jars with plug |
| 1 Funnel | 1 Bottle of sodium hydrate |
| 1 Agitator | 1 Bottle of methylene blue |
| 1 Graduated cylinder, 100 ml | 1 Bottle of Griess reagent |
| 1 Spoon | 1 Bottle of Nessler reagent |
| 3 Solutions of known pH | 1 Bottle of chloride acidacido, 10% sol. |
| 2 Syringes with tube | 1 Bottle of barium chloride, 10% sol. |
| 1 pH indicator, 1-10 | 1 Bottle of chloroform |
| 1 pH meter for soil | 1 Experiments guide |
| 5 Petri dishes | 1 Small case |
| 1 Pack of 30 filter paper discs | |

## COLORIMETRIC TEST

These kits allow the quick and easy determination of the presence of specific ions by means of an high precision comparison scale.

**HI4829 Ammonia kit**
It uses Nessler method. Range: from 0 to 2,5 ml/l of $NH_3$-N.

**HI4830 Bromine kit**
When the chlorine is absent, the kit measures bromine through the DPD method.
Scale: from 0 to 3,0 mg/l di $Br_2$. .

**HI4831 Chlorine kit**
It measures the values of free and total chlorine by the DPD method.
Range: from 0 to 2,5 mg/l of $Cl_2$.

**HI4832 Iodine kit**
By the dpd method it is possible to determine the values of iodine in the absence of chlorine.
Range: from 0 to 2,5 mg/l of $I_2$.

**HI4833 Phosphates kit**
Thanks to this kit it is possible to determine the values of the orthophosphates.
Range: from 0 to 5 mg/l of $PO_4^{3-}$

**HI4834 Iron kit**
Thanks to this test it is possible to determine the quantity of iron in the solution.
Range: from 0 to 5 mg/l of $Fe^{2+}$ and $Fe^{3+}$.

HI4831

HI4832

**HI4833**


**HI4810**

**All kits present the same features.**

**HI4819**

**Every combined kit includes an electronic pH-meter for a thorough pH measurement. Easy to use, inexperienced users can handle it too.**

The most accurate method to determine the ion concentration in a solution is the titration that consists in making a known quantity of sample react with a quantity of reagent untill reaching a complete neutralization. This situation can be expressed by the relation:

$$C_x = \frac{C_2 \times V_2}{V_1}$$

Where:
$C_x$ = concentration of the sample
$V_1$ = volume of the sample
$C_2$ = standard concentration
$V_2$ = standard concentration (determined by titration)

## TEST FOR TITRATION

**HI4810 Dissolved oxygen kit**
The Winkler method is used to determine the dissolved oxygen.
Range: from 0 to 10 ppm of $O^2$.
Sample: 5 ml and 10 ml.

**HI4812 Hardness kit**
A complexometric titration with EDTA is used to determine the values of total hardness in the solution.

Range: from 0 to 30,0 mg/l of $CaCO^3$.
from 0 to 300 mg/l of $CaCO^3$.
Sample: 5 ml and 50 ml

**HI4815 Chlorides kit**
By the mercurimetric method it is possible to get the chlorides values.
Range: from 0 to 100 mg/l of Cl-.
from 0 to 1000 mg/l of Cl-.
Sample: 5 ml and 50 ml.

**HI4820 Acidity kit**
For titration of sodium hydroxide's standardized solutions, the acidity and the phenolftalein acid.

Range: da 0 a 100 ml/l di $CaCO_3$.
da 0 a 500 ml/l di $CaCO_3$.
Sample: 5 ml and 25 ml..

**HI4822 Sulphites kit**
Using a iodometric method it is possible to determine the sulphites levels.

Range: from 0 to 20,0 mg/l of $Na_2SO_3$.
from 0 to 200,0 mg/l of $Na_2SO_3$.
Sample: 5 ml and 50 ml

**HI4839 Hydroxide kit**
It permits to evaluate the hydroxide concentration in watery solution.

Range: from 0 to 1 g/l of OH-.
from 0 to 10 g/l of OH-.
Sample: 5 ml and 50 ml.

## COMBINED TEST

It is possible to find all the advantages of colorimetric tests and titration in these combinations

**HI4819 Acidity, pH, alkalinity and iron kit**

**HI4814 Acidity, alkalinity, carbon dioxide, dissolved oxygen, hardness and pH kit**

**HI4817 Alkalinity, chlorides, hardness, sulphites, iron and pH kit**

## 7204 Laboratory for soil analysis

Kit with elements for the determination of:
- soil structure
- nitrates;
- phosphates;
- potassium;
- pH.

All the materials, chemical reagents and accessories are neatly kept in a small case with shaped internal part. The instructions guide describes in details the possible experiments in order to perfom them in a correct way.


## 7205 Laboratory for microbiological researches

This kit allows the performance of a wide range of microbiological analysis related to water and soil. It has been designed as a field laboratory in order to use it even in sampling sites.
It is possible to perform the following reseaches and analysis:
- presence of microorganisms in water;
- presence of microorganisms in the soil;
- antibiotics' effects;
- presence of yeasts in nature;
- formation of gas during the alcoholic fermentation;
- development and growth of bacterial colonies at different temperatures.

Included items:
Equipment for filtration under pressure; filtration valve with 3 ports; plastic adapters for filtration; pincers for filters; handle for inoculation; culture soil in sterile test-tubes; culture soil in Petri dishes; discs with sterile filters, cellulose nitrate filters, glass filters.
Instructions manual.


## 7219 Small portable laboratory

It is a portable laboratory for water and soil analysis.
Easy and practical to transport in its light and elegant case.

### Executable analysis:

pH value of water (from 3 to 9)
Nitric acid in water (from 10 to 80 mg/l)
Ammonium in water ( from 0,05 to 10 mg/l)
Phosphate in water ( from 0,5 to 6 mg/l)
Nitrite in water (from 0,02 to 1,0 mg/l)
General hardness of water: 1 drop =1 degree (german hardness degree) pH of soil (from 3 to 9)
Nitric acid of soil (form 10 to 80 mg/l)
Phosphate in the soil (da 0,05 a 6 mg/l)
Ammonium in the soil (from 0,05 to 10 mg/l)

There are no disposal issue with these reagents, (both in the concentrated or diluted form) which belong to the zero danger class for water.

### Supplied items:

1 Colors table
1 Filter support
1 Enlarger
1 Pincer for the observation of small animals
1 Waterproof mattress DIN A4 for biological test
3 Packs of filter paper for the preparation of soil extractions' solution
1 Funnel
1 Bottle, 100 ml
1 Bottle, 250 ml
1 Dispenser for pipettes
6 Plastic test-tubes
2 Droppers
Various reagents

Instructions manual.

# SAMPLE COLLECTION








**7206** **Sampler for probing**
Sturdy tool made of steel which permits to perform ,in an easy and quick way, the probing necessary for soil samples collection.
The probing system is particularly useful because it permits to collect soil samples to a depth of about 30 cm. This feature permits to study soil composition, its features and the elements which are present in it, even in depth. The use of the tool is very easy thanks to a transversal bar to support the thrust foot.

**7207** **Telescopic arm for probing**
Arm that can be extended, made of fibreglass. Minimum length, 145 cm, it can be extended up to 275 cm. Suitable for the support of samplers when the distance between user and the sampler is too big

**7208** **Net for soil probing**
Special metallic net, suitable for soil collection and soil sieving. Thanks to it, it is possible to separate materials and small animals from soil. To be used with the telescopic arm code 7207

**7209** **Multipurpose support pincer**
To support bottles for water samples collection. To be used with telescopic arm code 7207.

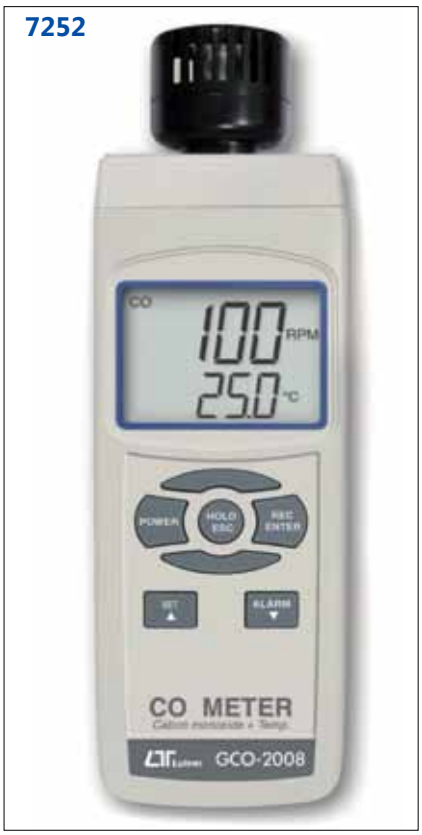
**7210** **Net for water probing**
This sturdy net, made of nylon, permit to collect solid elements which are present in the water or floating on the surface. To be used with telescopic arm code 7207. Diameter 200 mm, depth 310 mm.

**7211** **Net for plankton**
Special net with dense texture suitable for planktons collection. At the bottom part of the net there is a collection vase(100 ml). Net diameter, 200 mm. To be used with telescopic arm code 7207.

**7152** **Deep water sampler**
This item can be used to take samples of water, from a pond, from a stream, from a pool or from other basin at a measurable depths.

**7000** **Secchi's disk**
This item permits to perform a qualitative evaluation of turbidity considering water of ponds, pools etc, according to their depth.

# DIGITAL INSTRUMENTS




**7252** **Carbon monoxide meter**
With this tool you can monitor the level of CO pollution in various environments and check, thanks to warning lights/sounds, when it exceeds the warning threshold. The data can be downloaded on a PC.

**FEATURES**
Two functions: CO (carbon monoxide), Temperature - CO Range: 0 to 1000 ppm
Temperature: 0 to 50 °C, ° C / ° F - CO measurement with fast response time - High accuracy and high repeatability
Stand-alone device, easy to carry and use - with a CO alarm setting function
Large LCD display, high contrast, easy to read - Memory function to hold the display value - Record the Max and Min reading - RS-232 PC and USB interface - Sturdy structure with hard case - Battery powered or with 9Vdc adapter.

**TECHNICAL SPECIFICATIONS**

| | |
|---|---|
| Display: | 52 mm X 38 mm LCD, dual function. °C / °F selection |
| Alarm Setting: | only for CO measurements |
| Data hold: | holds the reading on the display |
| Display refresh time: | approximately 1 second |
| Auto power off | to save battery life or manual through button |
| Zero button | to set the zero reading |
| Data output: | RS-232/USB Interface<br>* Connect the optional RS-232 cable UPCB-02<br>* Connect the optional USB cable USB-01 |
| Operating temperature | 0 to 50 ° C |
| Operating Humidity: | less than 85% RH |
| 1.5 V Power Battery | (UM4, AAA) X 6 pieces |
| Weight | 336g |
| Size | 210 X 68 X 42 mm |
| Accessories Included: | Instruction Manual |
| Carrying Case | |
| Optional Accessories | RS-232-02 Cable UPCB<br>USB cable USB-01<br>SW-U801-WIN Acquisition software |

ELECTRICAL SPECIFICATIONS (23 ± 5 ° C) CO (carbon monoxide)
Range 0 to 1000 ppm
1 ppm resolution
Temperature ange 0 ° C - 50 ° C
Resolution 0.1 ° C

## 7253 Oximeter - for measurement of dissolved oxygen

This pulse oximeter is equipped with a polarographic probe with built-in temperature sensor that allows a precise measurement of dissolved oxygen. Applications: aquariums, medical laboratories, agriculture, water conditioning, fish farming, mining, education, quality control.

| | | |
|---|---|---|
| Display: | | 13mm LCD, 3 1/2 digits |
| DO measurement range: | | 0 - 20.0 mg/l |
| Resolution: | | 0.1 mg/l |
| Accuracy: | | ± 0.4 mg/l (after calibration within 23 ± 5 ° C) |
| Compensation Temperature Sensor: | | Automatic from 0 to 40 ° C |
| Control panel knobs: | | ZERO and CAL knob |
| Battery: | | DC 9V 006P |
| Operating Temperature: | | 0 ° C - 50 ° C |
| Operating Humidity: | | Less than 80% RH |
| Size: | Instrument: | 131 x 70 x 25 mm |
| | Probe: | 190 mm x 28 mm diameter |
| | Length of sensor cable: | 4 m |
| | Weight: | 390g (with probe) |

| | | |
|---|---|---|
| Accessories included: | oxygen probe (09N-OXPB | 1pcs |
| | Operator's Manual | 1pcs |
| | Spare Probe with diaphragm set, OXHD-04 | 2 pcs |
| | Electrolyte for OXEL-03 probe | 1pcs |

## PH-2 Pocket pH-meter

Suitable for measuring the pH of water and soil. Immerse the electrode in the sample in order to perform the measurement. Scale: da 0,00 pH a 14,00 pH. Resolution: 0,01 pH. Precision: ±0,2 pH. Size: 66x50x25 mm probe not included.

## HI98128 Portable pH-meter with thermometer

Suitable for measuring the pH of water. Immerse the electrode in the sample in order to perform the measurement. It is supplied with two buffer solutions with pH 4,01 and 7,01 pH for the calibration at 25OC. Continuous functioning: 3000 hours. Range: from 0,00 pH to 14,00 pH. Resolution: 0,01 pH. Precision: ±0,2 pH. Thermometer included with the instrument. Measuring range: from 0,0°C to 60,0°C. Resolution 0,1OC. Size: 163x40x26 mm.

## HI774P Calibration solutions for pH-meters

2 sachets of 20 ml containing a buffer solution with pH = 4,01 and a buffer solution with pH = 7,01 of potassium acid phthalate. Calibration temperature 25°C.

## HI7061M Solution for the cleaning of pH-meters' electrodes

One 230 ml bottle to clean the electrodes' junction at least once a week to avoid stopping and keep the precision.

## CHT Digital electronic thermometer

With stainless steel penetration probe. Suitable for measuring the temperature in the air, in the liquids and in the soil. Continuous functioning: 3000 hours. Range: from - 50,0OC to + 150,0OC. Resolution: 0,1OC. Precision: ±0,3OC full scale. Size: 66x50x25 mm.

## CHT-1 Digital electronic thermometer with cable

The penetration probe is connected with a long cable (1 meter) to the item which has a support to keep its vertical position . Same features of the item code CHT. Size: 106x58x19 mm.

## HYG Hygrometer

It is a small item for measuring environmental relative humidity. Continuous functioning: 100 hours. Range: from 10,0% to 90,0% of R.H. Resolution: 0,1% U.R. Precision: ±3% full scale. Size: 180x30x15 mm.

## DIST-1 Meter for dissolved solids

Once immersed in the water under examination, this item endowed with automatic compensation of the temperature gives the concentration of ICaCO3 and MgCO3 in mg/l, that is in ppm (parts per milion). From this measure it is possible to evaluate the hardness of the sample water according to the table reported to the right. It is supplied with calibration solution. Continuous functioning: 150 hours. Range: from 0 mg/l to 1990 mg/l. Resolution: 10 mg/l. Precision: ±2 mg/l full scale. Size: 150x30x24 mm.

## DIST-3 Conductivy meter

This item with automatic compensation of temperature gives the measure of the conductivity in µS/cm of sample water.
From this measure it is possible to evaluate the hardness of analyzed water. It is supplied with calibration water. Continuous functioning: 150 hours. Range: from 0 µS/cm to 1990 µS/cm. Resolution: 10 µS/cm.
Precision: ±2 µS/cm full scale. Size: 150x30x24 mm.

## HI7032P Calibration solution for dissolved solids'meters

One bottle of 30 ml containing a solution of potassium chloride standardized with 1382 ppm (mg/l) at a temperature of 25°C.

## HI7030P Calibration solution for conductivy meter

One bottle of 30 ml containing a solution with a conductivity of 12,880 µS/cm at a temperature of 25°C.







## CONDUCTIVITY TABLE

| | | | |
|---|---|---|---|
| Pure water | 0,055 µS/cm | Drinking water | 1,055 µS/cm |
| Distilled water | 0,5 µS/cm | Seawater | 56 mS/cm |
| Mountain water | 1,0 µS/cm | Brackish water | 100 mS/cm |
| Water for domestic use | 500-800 µS/cm | | |

## WATER'S HARDNESS

Using meters for dissolved solids or conductivy meter it is possible to evaluate, even in french degrees (°f), the hardness of water which depends on the concentration of calcium carbonate and magnesium carbonate.
Considering that
1 mg/l = 1 ppm corresponds to 2 µS/cm and
1°f corresponds to 10 ppm of CaCO3,we obtain the following

## WATER HARDNESS TABLE

| µS/cm | ppm | °f | hardness |
|---|---|---|---|
| 0 - 140 | 0 - 70 | 0 - 7 | very fresh |
| 140 - 300 | 70 - 150 | 7 - 15 | fresh |
| 300 - 500 | 150 - 250 | 15 - 25 | not very hard |
| 500 - 640 | 250 - 320 | 25 - 32 | medium hardness |
| 640 - 840 | 320 - 420 | 32 - 42 | hard |
| more than 840 | more than 420 | more than 42 | very hard |

# INSTRUMENTS DIGITAL

**WTT**


**WTT** **Water test**

This practical and light item is a real portable laboratory to obtain quick and reliable measurements of the four main variables of water:

- temperature
- conductivity
- pH
- redox potential

Automatic compensation of the temperature from 5°C to 50°C. After having performed the calibration in pH and conductivity thanks to the supplied solutions, fill the chamber situated in the base of the instrument with the water to be analyzed, switch on the instrument and select the desired parameter using the "RANGE" key. Continuous functioning: 200 hours.
Size: 150x30x24 mm.

| | TEMPERATURE | PH | CONDUCTIVITY | RP |
|---|---|---|---|---|
| Range: | 0.0 - 60.0°C | 0.0 - 14.0 pH | 0 - 1999 µS/cm | ±1000 mV |
| Resolution: | 0.1°C | 0.1 pH | 1 µS/cm | 1 mV |
| Precision: | ±1°C | ±0.2 pH | 2% full scale | ±5mV |
| Calibration: | - | 2 points | 1 point | - |

**LF2400**

**LF2400** **Photometer for water analysis**

Specific ions meter designed for an educational use, without compromising the accuracy of measurement.
This instrument can measure 50 different parameters to test chemically the quality of water and analyze the presence of several substances and elements with the accuracy of a chemical laboratory. Microprocessor functioning. The RS-232 port permits the connection to the PC and the software permits the configuration of the instrument, the storage of multiple calibration points, the storage of data and their processing.

Supplied items:
1 power unit
2 test-tubes
1 bottle brush
1 USB key
2 5ml syringes.
Instructions guide.
1 Pyramidal cover
10 test-tubes
1 USB key
1 funnel

**FOR THE PURCHASE OF THE REAGENTS REQUIRED TO PERFORM THE TESTS WITH THE PHOTOMETER LF2400, SEE THE GUIDE ON PAGE 1**

# STATIONS FOR THE DETECTION OF AIR POLLUTION

**7012**

**Wall application**

**7014**

**Couple of USB sensor**

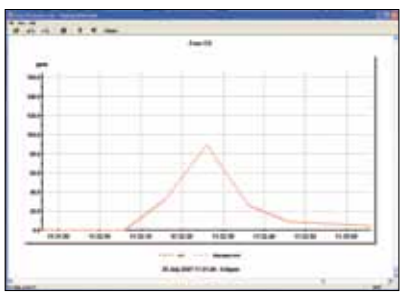
**7012** **Wall station**

The station code 7012 has been designed for a first quantitative study of air quality.
It can be installed against the wall or on a tripod and it measures the temperature, the humidity and the concentration of carbon monoxide typical of pollution caused by traffic.
It is possible to set an alarm that sounds when the CO level exceeds a specific threshold.
The supplied sensors are powered by lithium batteries (replaceable) that permit the unit to operate continuosly up to three months.

At the end of the measurement, the data are transferred on a pc and seen on a graph.
Range: temperature: from -35 to +80OC.
Relative humidity: from 0% to 100% RH.
CO: from 0 to 200 ppm CO.
(Values greater than 800 ppm can damage the sensor)

**7014** **Station on tripod**

As the previous one but on a tripod.



# SECTION 7

## INDEX



# METEROLOGY

5654

**SUPPLIED EQIPMENT**

| | | | |
|---|---|---|---|
| 1 | Beaker 250 ml | 1 | Funnel with stopper |
| 1 | Pincers with clamp | 1 | Anemometer |
| 1 | Erlenmeyer flask 100 ml | 1 | Curved glass tube with stopper |
| 1 | Stand with rod | 1 | Graduated cylinder 250 ml |
| 1 | Test tube 16x160 mm | 1 | Plastic bag |
| 1 | Rubber baloon | 1 | Jar with stopper |
| 1 | Tripod stand | 1 | Fan with stand |
| 1 | Alcohol burner | 1 | Plexiglas plate with support |
| 1 | Fire-spreading net | 1 | Protractor with needle |
| 1 | Max/min thermometer | 1 | Methylene blue bottle |
| 1 | Barometer | 1 | Lime water bottle |
| 1 | Psychrometer | 1 | Denaturated alcohol bottle |
| 1 | Transparent tube with stopper | 1 | Didactic guide |
| 1 | Hair hygrometer | 2 | Cases |
| 1 | Complete app. for the study of the Sun | | |
| 1 | Environment thermometer | | |
| 6 | Candles with 3 candle-holders | | |

## 5654 METEOROLOGY

### 25 experiments

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2. Solar radiations
3. Solar irradiation
4. The Greenhouse effect
5. Sun's apparent motion
6. The seasons
7. The atmosphere
8. The air's components
9. The air's temperature
10. The thermometer and the environment.
11. The max-min thermometer
12. The air weights
13. The atmospheric pressure
14. The barometer
15. When the air heats up
16. The movements of the air - winds
17. The anemometer
18. The water cycle
19. The rain - the rain gauge
20. Steam in the air
21. Relative humidity-the hygrometer
22. Atmospheric precipitations
23. Weather forecast
23. Le previsioni del tempo

2080

2029

2033

2041

2038

2142

# INSTRUMENTS

**2080 Wall thermometer**
Graduation: -30°C +50°C. Wood stand, white scale.

**2038 Indoor and outdoor max-min thermometer**
The item is mounted on plastic base and endowed with a small shelter for outdoor usage.

**2029 Three-scale thermometer**
It is mounted on a wood base.

**2033 Psychrometer**
It is mounted on plastic base and endowed with two thermometers and respective calculation charts.
Dimensions:32x16 cm.

**2041 August's psychrometer**
It is mounted on metal base and endowed with two thermometers and respective calculation chart.
Dimensions: 27x7 cm.

**2142 Digital Anemometer**
This digital anemometer is equipped with a sensor connected to a portable data logger that detects several anemometric parameters simultaneously.
• Air speed in different units: Knots, mph, km/h, m/s, ft/min, Bft
• Temperature in ° C or ° F
• Temperature and wind chill (a measure of the heat lost by the human body because of the wind)
• Storing the maximum value
• Overload flow indicator
• Battery level indicator
• Automatic switch-off
Specifications:
Air speed range: from 0.4 to 30 m / s - 3% speed accuracy - Speed resolution 0.1 m / s - Temperature: 0 to 50 °C (NTC sensor) - 1% Accuracy Temperature - Temperature resolution 0.1 ° C - 9V battery - Data
Logger size 160x74x34mm, weight 34g.

**1055** **Wall siphon barometer**
It works with mercury and is mounted on metal plank with mobile ruler and short scale. It is supplied with centigrade thermometer

**1054** **Wall metal barometer**
Instrument diameter: 10 cm. Base diameter: 13 cm.

**2081** **Synthetic hair hygrometer**
Diameter: 130 mm.

**2109** **Rain gauge**
For general use.

**2098** **Rain gauge**
It is suitable to be driven into the ground and is made of plastic.

**2060** **Professional rain gauge**
This instrument is suitable to measure the precipitations. It is constituted by a stainless steel cylinder with conical mouth, a glass container and a graduated cylinder.

**2120** **Didactic anemometer**
It is easy to be used ; it points out both direction and intensity of the wind.

**2083** **Meteorological station**
Metal structure with shelter for outdoor usage. With:
1 Max-min thermometer -50 +37°C and -30 +50°C.
1 Barometer 940 - 1040 mbar.
1 Hygrometer 0 - 100%
Dimensions: 465x125 mm.

**2069** **Meteorological station**
Metal structure with:
1 Thermometer -30 +50OC.
1 Barometer 980 - 1040 mbar.
1 Hygrometer 0 - 100%.
Dimensions: 390x173 mm.

**2082** **Meteorological station**
Metal structure. It is endowed with two small shelters for outdoor usage : they allow the station to be positioned both horizontally and vertically.
With:
1 Thermometer -20 +60OC.
1 Barometer 920 - 1050 mbar.
1 Hygrometer 0 - 100%.
Dimensions: 340x150 mm.

**1406** **Tornado model**
The tornado is a violent air vortex which originates at the base of a cumulonimbus cloud and reaches the ground. The most common cause of a tornado is the whirling turbolence originated by a strong pressure difference between the air next to the ground and the air close to the cumulonimbus cloud.
In this apparatus the pressure difference is created by an electric lift pump
(we suggest the use of code 1415).



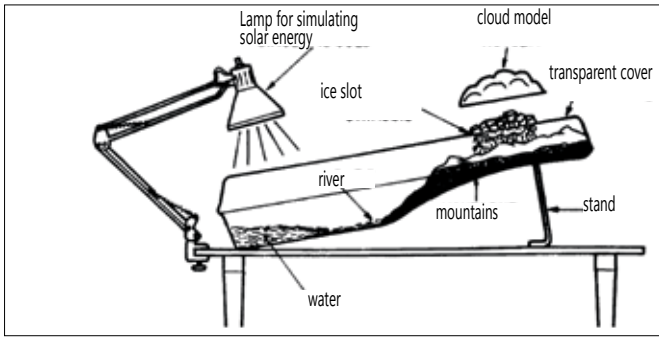









**HS2510**




**2084**

**HS2510** **Water cycle model**
It enables you to visualize the evaporation, the condensation and the precipitation of water thanks to the use of a common table lamp.
Didactic guide included.

**2084** **Meteorological shelter station**
Forex structure, suitable for outdoor usage.
Metal parts made of stainless material.

With:
1 Rain gauge
1 Max/min thermometer
1 Barometer
1 Hygrometer
1 Wind's direction indicator with wind rose
Dimensions: 33x48x58 cm.

**2084 ON 2061**

**2061** **Stand for meteorological shelter station**
Made of fire-glazed metal.
Dimensions: 35x50x100 cm.

**8255** **WIRELESS METEOROLOGICAL STATION**
This station, endowed with stand, tripod, guy ropes and wall hold, allows you to monitor from a distance the most important meteorological parameters thanks to its sensors.
Every sensor transmits the data in real time to a remote junction box, and it is possible to download the data on the PC. The junction box has a display to visualize the data in real time and to store them.The software is included.
Checked data:

- Temperature and heat index;
- Relative humidity and dew point;
- Wind's speed and direction;
- UV rays irradiation index;
- Atmospheric pressure;
- Daily and cumulated precipitations
- Weather forecast;
- Meteo alarms for each checked measure;
- Graphic representation of the data trend in relation to the weather during the last 24 hours;
- Visualization of hour, calendar and moon phases.

**8255 Wireless meteorological station**