



AMOLA® AGRAR MOBILE LAB with accessories

Using the AMOLA® for photometric determination of NPK

The AMOLA® Agrar Mobile Lab contains all the key reagents, equipment and accessories that you need to make a quick, easy and reliable assessment in the lab or in the field. It can be used to determine any of the main readily soluble, plant-available nutrients: nitrogen, phosphorus and potassium (NPK). It is useful for agriculture, horticulture, tree nurseries and composting plants applications. Consultants and plant production specialists also make use of the AMOLA®.

After a sample is taken, the ammonium NH_4 , nitrate NO_3 , potassium K and phosphate PO_4 in the soil are converted by extraction into liquids and treated with a specific colour reagent. The intensity of the colour indicates the quantity found in the soil of each of these substances.

The Amola® base unit provides you with an objective determination of the colour intensity. The sample type (e.g. mineral soil, substrate, water) and the desired soil component are first specified – then the desired measurement is displayed using the relevant units. For mineral soils, the displayed unit is kg/ha (kilograms per hectare) or mg/kg soil (milligrams per kilogram). For horticulture substrates the unit is in mg/l of substrate (milligrams per litre), and for water samples the unit is mg/l (milligrams per litre).

Ammonium can be specified as NH_4 and NH_4 ; nitrate can be specified as NO_3 and NO_3 -N. The total nitrogen is determined from the sum of the ammonium- and nitrate-nitrogen (NH_4 -N + NO_3 -N). Phosphate is calculated as PO_4 , PO_4 -P or P_2O_5 ; potassium is calculated as K or K_2O .

The manual (included here) uses simple illustrations to describe the sampling, processing, extraction and analysis methods.

TECHNICAL SPECIFICATIONS:

Type:	LED photometer: microprocessor controlled, with auto-test and auto-calibration
Lens:	LED + 2 inference filters
Wavelengths:	450 nm (NO_3 -N), 660 nm (NH_4 -N, PO_4 -P, K)
Precision:	± 2 nm, half-width of 10 to 12 nm
Cuvette holder:	Round cuvettes with 16 mm outer diameter
	In sensitive to ambient light
	Measurements with uncovered cuvette shaft are possible
Detector:	Silicon photocell
Display:	Illuminated graphical display, 64 x 128 pixels
Operations:	Easy to use with icons on the display
	Pre-programmed tests for VISOCOLOR® ECO tests
	Result with dimension specification, date, time
Data storage capacity:	50 measurements
Interface:	Mini USB
	Free software updates via internet / PC
Operating range:	5 to 50°C at 90% relative humidity
Power supply:	3 AA batteries, rechargeable batteries
	USB interface; optional internal battery pack
Housing:	Waterproof, IP67 (30 min, 1 m)
Dimensions and weight:	170 x 95 x 68 mm; 0.5 kg

Art. No.	
1806	AMOLA® AGRAR MOBILE LAB with accessories
	Contents: see box at left side
1828	AMOLA® AGRAR MOBILE LAB, base unit
ACCESSORIES	
5001	Sampling auger with volume graduations
2049	Plastic shovel
2057	Spatula
0810	Sieve with drip pan
4066	High-precision scale: 0 – 500 g with calibration weight
2006	Round filter, MN 615 diameter 150 mm, 100 per package
0570	100-ml graduated cylinder, with graduated scale
2044	250-ml graduated cylinder, with graduated scale
2043	Powder funnel, 80 mm diameter
2029	Wide-neck extraction bottle, 0.5 litre, with top
2058	Sample container, 50 ml, with screw cap and graduated scale
2059	Sample container, 15 ml, with screw cap and graduated scale
2060	5-ml plastic syringe with 0.2 ml graduation marks
2061	MN 10-ml cuvettes with screw cap
1876	CaCl_2 extraction concentrate, 1 litre rectangular bottle
1877	CAL extraction concentrate, 1 litre rectangular bottle
2091	Distilled water, 1 litre rectangular bottle
2070	Nitrite test strips, Quantofix (100 tests)
2092	Measuring spoon for Visocolor tests
1886	Visocolor® ECO ammonium 3 (approx. 50 tests)
1895	Visocolor® ECO nitrate (approx. 110 tests)
1889	Visocolor® ECO phosphate (approx. 80 tests)
1883	Visocolor® ECO potassium (approx. 60 tests)
2093	Sedimentation tube
2095	Glass tamper for the sedimentation analysis
2096	Pyrophosphate solution for the sedimentation analysis

Possible steps in the process

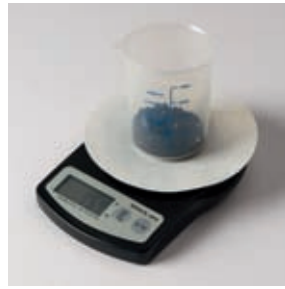
HOMOGENIZATION

TAKING THE SAMPLE



1a) Using sieves to homogenize the soil sample

+



and: weighing the soil sample to determine the nutrient content in mg/kg

or

SINGLE SAMPLE SUBSTRATE



1b) Measuring the sample volume with the graduated sample container (e.g. for horticulture gardening substrata)

or

SINGLE SAMPLE MINERAL SOILS



1c) Measuring the sample volume using the graduated sampling auger (e.g. for mineral soils)

PREPARING THE SAMPLE



2) Adding an extraction agent to the sample



3) Extraction by repeated shaking



4) Filtration of the extract using a round filter



5) Measuring the filtrate with a graduated plastic syringe

ANALYSIS OF SAMPLES



6) Fill the measuring cuvette



7) Add a defined number of drops of the colour reagent



8) Add the reactant.



Hand model: Sarah Tobéhn

9) Insert the cuvette into the AMOLA® base unit. Read the measured value directly in kg/ha (mineral soils) or mg/l of substrate (for substrates), or ...

Measurement range *

Parameter	Mineral soils		Horticulture substrates	Water samples	Precision
	kg/ha	mg/kg	mg/l of substrate	mg/l	%
NH ₄	4-80	1-26	13-260	> 0.1	± 5
NH ₄ -N	3-60	1-20	10-200	> 0.1	± 5
NO ₃	130-1,850	40-620	90-1,230	> 4	± 10
NO ₃ -N	30-420	10-140	20-280	> 1	± 10
PO ₄	180-4,500	60-1,500	60-1,500	> 0.6	± 1
PO ₄ -P	60-1,500	20-500	20-500	> 0.2	± 1
P ₂ O ₅	138-3,450	46-1,150	46-1,150	> 0.5	± 1
K	120-900	40-300	40-300	> 2	± 5
K ₂ O	144-1,080	48-360	48-360	> 2.5	± 5

* For higher levels out of the measurement range (e.g. 500 mg/l NO₃-N), you should dilute the filtrate with distilled water (e.g. 1:2). The measured result must then be multiplied by the dilution factor (e.g. 250 mg/l measured x 2 = 500mg/l)

Contents of the AMOLA® AGRAR MOBILE LAB case:

Case, AMOLA® base unit, sampling auger, sieve, drip pan, shovel, spatula, scale with weight, filter, measuring cylinder (100 ml), measuring cup (25 ml), funnel, bottle (0.5 l), sample vessels (15 and 50 ml), syringe (5 ml), four glass cuvettes, 1 litre of CaCl₂, 2 x 1 litre of CAL, 1 litre of distilled water, nitrite test strips, Visocolor test for ammonium, nitrate, phosphate and potassium, sedimentation tube, glass tamper, pyrophosphate solution