

NPA: Nutrients Probe Analyzer



NPA is submersible multiparametric in-situ probe for sequential automatic analysis of up to four nutrients or other chemical parameters in surface and sea water.

NPA is specifically designed for unattended monitoring in oceanographic research, environmental protection and biological studies.

NPA is available in two version:

- *NPA Plus*: stand-alone deployable layout
- *NPA Pro* two cylinders: to be integrated in coastal buoys.

The standard wet chemistries for nutrients analysis used in **NPA Plus** and in **NPA Pro** are the ones recommended by international standards:

- NH₃: Berthelot reaction
- PO₄: Molibdate, Ascorbic acid
- NO₃+NO₂: Cd reduction NED, SAA
- NO₂: NED, SAA.



New innovative chemistries are also available to make easier the management of the on site operations:

- NH₃: fluorimetric OPA method
- NO₃+NO₂: UV photoreduction method exclusively licensed to Systea by Ifremer (French Research Institute for Exploitation of the Sea).

Other chemical parameters available are:

- Total Phosphorous
- Total Nitrogen (UV Reduction)
- Total Dissolved Iron
- Silicates
- Sulphide.



FEATURES ANF BENEFITS:

- Up to four parameters sequentially measured
- Easy reagents replacement
- Low reagents consumption (about 200 microliters of each reagent for analysis)
- Reagents sealed bags refrigerated by surrounding water (Peltier refrigeration available on request)

ADVANCED FUNCTIONALITY:

- Toxic waste is collected in a special bag placed inside the reagents compartment (*Pro* version) or outside the **NPA** body (*Plus* version)
- DI water is used to wash the hydraulic circuit and to perform a diluted measurement
- Self-cleaning filtration unit available as option.

NPA Plus



NPA Plus

The NPA PLUS probe is specifically designed to be used as a stand-alone system for in situ coastal monitoring; its stainless steel mooring frame allows an easy deployment from ships or floating platforms.

The upper part of the system contains a replaceable internal basket, to speed-up reagents replacement.

The microLFA analytical reactor of the NPA Plus is configured as a multitest manifold, where all the components of the loop, such as valves, heating bath, pump, UV reduction device, fluorimeter and colorim

er are managed by the resident software and activated when needed; a proper method sequencing and washing ensures zero carry over.

Auto-calibration is performed by concentrated standard contained inside the internal reagents basket of the probe.

The 12 Vcc power supply and the RS-232 serial communication are both included in just one submersible cable.

NPA CONTROL PANEL SOFTWARE

The NPA panel is a software application to be used with both **NPA Plus** and **NPA Pro**, using the RS-232 or even RS-485 serial port (optional), available from the external electric connector.

It can be used locally or remotely (GSM device) to:

- see and modify the main operation parameters
- directly examine the real-time OD value inside the LFR during the measurement
- have a direct reading of the measurements collected by the unit
- program the probe in the monitor mode

- download the memory buffer with measured data.
- modify the operation sequence for any method.



NPA Control panel software

NPA Pro

The new NPA Pro has been designed to be best integrated in coastal buoys. The two cylinders can be easily placed on the buoy's body holes and then simply anchored with chains or hooks or snaphooks.

It is made of two different PVC cylinders:

- the first one includes hydraulic and electronics components
- the second one includes reagents, calibrant, DI water and waste bag.

A single hydraulic connector with 10 tubing is used to connect the second cylinder to the first one. This multi-connector is provided with a valve to open it during functioning and to close it during transportation, to avoid reagent spillage.



NPA Pro



Electronic cylinders top

ADVANTAGES

- Two cylinders are more convenient/easy to deploy: the electronic compartment is never removed.
- The NPA Pro doesn't unbalances the buoy: the single body, if placed externally, can tilt the whole system that needs redistribution of buoyancy.
- If needed, the Cd column, may be placed just above the electronic compartment
- The reagent compartment may be changed as a whole; its allowance is around 17 litres.
- Long lasting reagents quantity, expected reagent changeover every 45/60 days.

SELF CLEANING FILTRATION UNIT

In the NPA Plus and NPA Pro probes a selfcleaning filtration unit is available on request, to avoid sampling clogging due to algae growing.

The standard filtration cut-off is 10 microns (new size) but 25, 50 and 100 microns are also available.

The overall dimensions are about 15 cm long and 4 cm O.D., for a filtering surface of about 190 cm², to ensure a large filtering surface.

The filtration units provides to run a self-cleaning cycle with compressed air.

SYS-RS MUX

- Serial multiplexer with N. 7 RS-232 ports with built-in microcontroller
- Allowing an easy remote control of a NPA probe from any datalogger
- Built-in extend control of other third party measuring devices are allowed too.

Technical data

NPA	
<p>MEASURED PARAMETERS: NH₃, PO₄, NO₃+NO₂, NO₂ (SiO₂, TP, TN, Fe²⁺, Fe³⁺, Urea).</p> <p>DETECTORS:</p> <ul style="list-style-type: none"> - Colorimetric multi wavelength dual beam with silicon detector; - Fluorimetric: excitation 370 nm, emission 420 ÷ 470 nm, 1 cm <p>TYPE OF ANALYSIS: sequential batch.</p> <p>ANALYSIS INTERVAL: programmable.</p> <p>MEASURING TIME: 20 minutes for a complete 4 parameters cycle.</p> <p>NUMBER OF PARAMETERS: up to 4.</p> <p>MAXIMUM IN-SITU DEPTH: 10 m.</p> <p>BODY MATERIAL: PVC, stainless steel.</p> <p>OPERATING TEMPERATURE: 4°-40 °C .</p> <p>HYDRAULIC CONNECTIONS: std. 3.2x1.6 mm Teflon.</p> <p>WASTE: directly discharged in water; toxic waste bag always available: inside the cylinder for NPA Pro and on the mooring frame for NPA Plus.</p>	<p>REAGENT EXPIRING: 4 to 10 weeks, depending on the method expiry.</p> <p>REAGENT COMPARTMENT COOLING: refrigerated by surrounding water; Peltier refrigeration available on request.</p> <p>AUTONOMY: up to one month, depending on measurement interval time.</p> <p>ELECTRONIC HARDWARE: industrial PC-104 CPU, externally programmable by serial communication port.</p> <p>DATA OUTPUT: RS 232 serial port RS 422 or RS 485 available on request.</p> <p>PROGRAMMING FUNCTIONS: provided by the external NPA PLUS/DPA control panel software.</p> <p>EXTERNAL CONNECTIONS: 6-pole submergible cable for serial data communication and 12 Vdc power supply.</p> <p>POWER SUPPLY: 12 Vdc, provided through the main connecting cable.</p> <p>POWER ABSORPTION: 4W in stand by, 10 W during analysis.</p>
NPA Plus	NPA Pro
<p>WEIGHT: 36 Kg without reagents (in air)</p> <p>DIMENSIONS: 320 mm diameter x 1220 mm height (including mooring frame)</p> <p>STANDARD PACKAGE INCLUDES:</p> <ul style="list-style-type: none"> - analytical and electronic unit - reagents basket - reagents bags set - stainless-steel mooring frame - 5 m submergible cable - NPA PLUS panel software start-up kit. 	<p>WEIGHT: 17 Kg for each cylinder</p> <p>DIMENSIONS: 250 mm diameter x 550 mm height</p> <p>STANDARD PACKAGE INCLUDES:</p> <ul style="list-style-type: none"> - analytical and electronic units - reagents bags set - 5 m submergible cable - NPA Pro panel software start-up kit.

Subject to change without notice