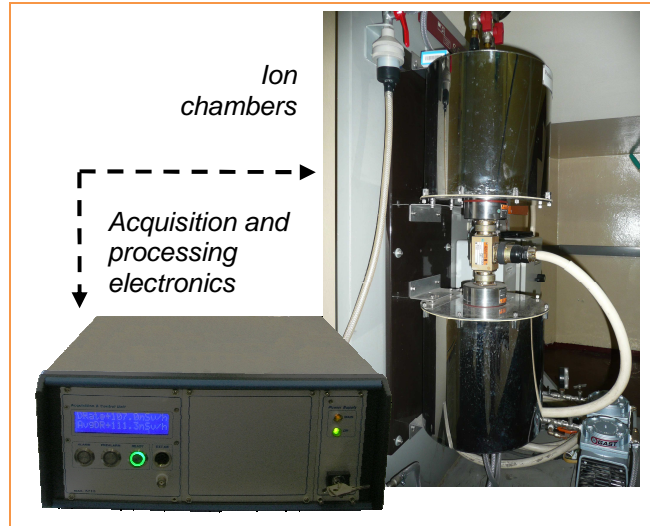


## ENVIRONMENTAL AERIAL BETA MONITOR UNIT WITH ION CHAMBERS

# NAUSICAA 5303 2IC

### MAIN FEATURES

- Detectors: double pressurized ion chamber
- Active volume of each chamber: 10 l
- Material: AISI 316 stainless steel
- Measurement range:  $3.7 \times 10^4$  Bq/m<sup>3</sup> -  $3.7 \times 10^9$  Bq/m<sup>3</sup>
- Local visualization of the acquired data and alarm statuses
- Connectable to a Host PC (available on request) through serial (RS485/422 available for long distances), Ethernet or wireless (on request) connection
- Remote management and data visualization software available on request



### DESCRIPTION

The aerial Beta monitor **NAUSICAA 5303 2IC** is a system designed to measure Beta activity in the air, compensating for the Gamma background. The main components are two identical ion chambers built in stainless steel, and the acquisition/processing electronics featuring a display and a functional operator interface.

The two ion chambers are cylindrical and typically aligned between them. The air to be monitored flows in just one of the two chambers, while in the second there is a reference gas (which can be air itself). The HV power supply value is the same for both cameras, but with opposite polarity. The electrodes of the cameras are connected on a single impedance, so the resulting current is actually the difference between the two single currents coming from each camera. This configuration allows to compensate for the environmental Gamma radioactivity, improving the measurement performance. Furthermore, before passing through the active volume of the chambers, the air flows in a de-ionizing space where electric charges are eventually absorbed; this process further limits possible spurious signals.

Given its configuration and its compensation ability, the monitoring unit can measure the gas (air) activity as follows:

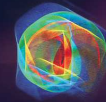
- Differential measurements with reference: a reference gas is put in one chamber, while the gas to be monitored flows in the other chamber
- Continuous differential measurements: the gas to be monitored flows in one chamber, while the other chamber is kept closed

The electronics of the **NAUSICAA 5303 2IC** performs the acquisition, the processing and the visualization of the data coming from the measurement unit. Thanks to the display it is possible to locally read the activity concentration value, and the built-in acoustic and luminous signaling devices alert the operator of any alarm, pre-alarm or malfunctioning event. The alarm and pre-alarm thresholds levels, as well as the others operative parameters, are saved in the internal non-volatile memory, and they can be entered by the operator using the provided keyboard or remotely via the management software (accessory).

The standard configuration of **NAUSICAA 5303 2IC** monitor, suitable for indoors applications, is composed by the measurement unit (wall- or panel-mounted) and a 3U 63HP desk rack which the electronics modules are installed in.

It's possible to connect the acquisition unit to a host PC through RS232 serial connection, for distances up to 10 meters; for longer distances (up to 1 km) a RS485/422 connection is available. Also, an Ethernet or wireless connection are available on request.

On the host PC is installed the archives transferring software, that allows to save the monitoring data and visualize them on the PC. Alternatively, the 5700 SMON software can be installed on request: 5700 SMON allows the complete remote management of the monitoring unit.



## TECHNICAL SPECIFICATIONS

### Detector unit

- Type: double pressurized ion chamber
- Material: AISI 316 stainless steel
- Measurement unit dimensions ( $\varnothing \times H$ ) = 30 x 85 cm
- Total measurement unit weight: 21 kg
- Active volume (each camera): 10 l
- Maximum supported flux: 3 m<sup>3</sup>/h
- Maximum pressure: 220 millibar
- Gas input/output tubes diameter:  $\varnothing$  18 – 20
- Insulation resistance: 10<sup>14</sup>  $\Omega$
- Power supply voltage: from  $\pm 150$  V to  $\pm 1000$  V

Note: with a 600 V value each camera can generate currents up to 10<sup>-8</sup> A, with a saturation error lower than 20%.

### Measurement performances

- Measurement range: from 3.7 x 10<sup>4</sup> Bq/m<sup>3</sup> to 3.7 x 10<sup>9</sup> Bq/m<sup>3</sup>
- Saturation: 9.25 x 10<sup>9</sup> Bq/m<sup>3</sup>
- Sensitivity:
  - Alfa emitting gas: 4.86 x 10<sup>-21</sup> A/Bq/m<sup>3</sup> per keV
  - Beta emitting gas (3.7 x 10<sup>4</sup> Bq activity)
    - Tritium: 1 x 10<sup>-14</sup> A
    - C-14: 8.8 x 10<sup>-14</sup> A
    - Kr-85: 7.6 x 10<sup>-14</sup> A
    - Xe-133: 1.3 x 10<sup>-13</sup> A
  - Gamma emitting gas: 10<sup>-7</sup> A/Sv/h
- Beta resolution: 5.45 x 10<sup>2</sup> Bq

### Acquisition and control unit

- Dose rate measurements: instantaneous ( $\mu$ Sv/h), 1 minute average and 1 minute maximum
- Integrated dose: referred to 1 hour, 24 hours and total
- LCD display 2x16 characters with LED and siren for alarm, pre-alarm and good functioning
- Real time clock circuit
- Watchdog circuit for functioning control
- Interfaces: RS232; RS485/422 for long distances; Ethernet 10/100; wireless (upon request)
- Memory: E2PROM for parameters, DataFlash for measurements

### Electrical characteristics

- Power supply: 230 Vac 50 Hz; consumption: 12 W (typical value)
- Temperature range: 0 ÷ 40 °C

## OPTIONS

- Wireless communication with host PC

## ACCESSORIES AVAILABLE UPON REQUEST

1. Data concentrator PC with 5700 sMON software
2. ALU alarm unit for status remote signaling
3. Warranty extension from 12 months to 24 months