



# X1 - APIS Isokinetic Sampler



**MEGA SYSTEM**  
s.r.l.

MANUFACTURER OF POLLUTION CONTROL SYSTEMS

X1 – APIS represent the most advanced version among all the actual automatic isokinetic sampler available today on the market; it allow to measure velocity and flow according the regulation EN 16911-1 and to sample in emission in accordance to the regulation EN 13284-1 and ISO 9096.

The chassis is made in anti-shock material and is reinforced with a metal structure. Two robust handles permit a better grip while moving the instrument.

It is available with a double head membrane pump capable of 4 m<sup>3</sup>/h or, in alternative, with a rotative pump capable of 6 m<sup>3</sup>/h. At the inlet of the line there is a dust filter easily removable from the upper panel and is also possible to install a moisture collection system.

The high prevalence of the pump and the electronic system for the flow management allow to automatically compensate the variations of the load loss caused by the filter clogging and to maintain the flow constant or the isokinetic flow during all the sampling period.

The command interface is available with an LCD display and a polyester keyboard or with a touch-screen graphical display. In this way is possible to display and manage easily the great quantity of information and data.

It has an input for measuring the temperature in the duct with "K" thermocouple and independent sensors for the measure of the pressures (differential, static and barometric) to satisfy the characteristic of "precision" required by the regulation. The instrument is compatible with all the Pitot and "K" thermocouple available on the market,

It is available in a version with all the parameter certified by E.A laboratories as requested for the ACCREDIA accreditation.

The characteristic that makes it unique is the possibility to manage the acquisition of the parameters from the MEGA SYSTEM analyser equipped with the Oxygen sensor (PARAMAGNETIC) and Carbon Dioxide sensor (NDIR) for the calculation of the density of the gaseous affluent in compliance with the regulations, saving the values during the sampling adjusting the isokinetic flow in real time.



The installation of an optional electronic card for the acquisition of signals of 4-20mA / 1-10V allowing the instrument to acquire and save in the sampling report the data coming from analyser of other manufacturer and to use some of the parameters acquired for the calculation of the isokinetic flow in real time.

On request is possible to predispose the instrument to guide the X1 - PROBE to regulate all the temperature signals saving the data in the sampling report.

The data measured are automatically saved and can be showed and saved on a USB FLASH DRIVE by the port on the upper panel.





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## FEATURES UNI EN ISO 16911-1

Program dedicated to execute the leak test of the measure tube (9.3.2 *Pre-test leak check*)

Setting of the angle in the measure tube; if the angle is greater than 15° the value of the speed in the point will be multiplied for the cosine of the angle itself (9.3.5 *Swirl or cyclonic flow*)

For each measure points it will be calculated the average value of all the parameters (temperature, differential pressure, static pressure and barometric pressure) based on instantaneous measures (9.5 *Measurement of flow at locations within the measurement plane*)

Is possible to insert the FWA value to execute the correction of the average velocity in the duct (10.4 *Correction of average velocity for wall effects*)

Thanks to the use of independent pressure sensors is possible to comply all the requirements of Table 3 (Performance Requirements), of Table 4 (Performance Requirements during field measurements) and Table A.1 — Performance requirements for differential pressure-based flow measurement

## FEATURES UNI EN ISO 13284-1

Indication and recording of the Isokinetic Grade (3.6 *Isokinetic grade*)

The regulation of the sampling flow is managed by a high precision electronic system that allow to module the isokinetic with a high accuracy and to regulate it in compliance with the regulation indications (8.4 *Sampling procedure*); in this way sudden and instantaneous changes of the sampling flow that could cause abnormal stress on the filter or in the solutions present in the line.

The pneumatic circuit is made using a pump vacuum tight and a dry gas meter (*figure 5 - example of aspirations units and device for gas measurement*). The dry-gas meter located at the end of the pneumatic circuit which works with a light overpressure compared to the atmospheric one and the absence of pneumatic elements for the flow control (Es. valve, flow meter, mass flow, etc.) reduce at the minimum the maintenance.

To measure the dry gaseous volume is used a dry-gas meter with an uncertainty less of 2% at the expected flow and it is supplied with a sensor to measure the absolute pressure and the temperature with an uncertainty less of 1% (6.2.8 *Unit of aspiration and device for gas measurement - a) point 4*)

### A.3.3 Absolute pressure of gas

Thanks to the static pressure sensor independent from the barometric sensor is possible to execute the calculations of the absolute pressure as indicated in the formula A.12 of the regulation and is possible to execute instantaneous measures to increase the QUALITY of the results.





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## TECHNICAL SPECIFICATIONS

### Specification of the version with the pump of 4 m<sup>3</sup>/h

#### Pump

Double head membrane pump of 4 m<sup>3</sup>/h  
High prevalence pump : > 600mmHg

#### Sampling flow

Range: 1 ÷ 50 l/min (free air vent)  
Resolution: 0,01 l/min  
Encoder resolution: 0,014 l/min  
Precision: < 1,5 %

#### Sampled Volume

Dry-gas meter G2,5  
Resolution: 0,1 l  
Encoder resolution: 0,014 l  
Precision: < 1,5 %

### Specification of the version with the pump of 6 m<sup>3</sup>/h

#### Pump

Rotative pump with graphite palette of 6 m<sup>3</sup>/h  
High prevalence pump: > 600mmHg

#### Sampling flow

Range: 5 ÷ 90 l/min (free air vent)  
Resolution: 0,01 l/min  
Encoder resolution: 0,072 l/min  
Precision: < 1,5 %

#### Sampled Volume

Dry-gas meter G4  
Resolution: 0,1 l  
Encoder resolution: 0,072 l  
Precision: < 1,5 %

### Specification of the sensors

#### Dry-gas meter temperature

Range: 0 ÷ 50 °C  
Resolution: 0,1 °C  
Precision: ± 1 % of the measured value (in Kelvin)  
Linearity: ± 1 °C (software linearization)

#### Differential pressure

Range: 0 ÷ 100 mmH<sub>2</sub>O (0 ÷ 1000 Pa)  
Resolution: 0,01 mmH<sub>2</sub>O (0,1 Pa)  
Precision: ± 1 % of the measured value

#### Static pressure

Range: -1000 ÷ 1000 mmH<sub>2</sub>O (-10.000 ÷ 10.000 Pa)  
Resolution: 1 mmH<sub>2</sub>O (1 Pa)  
Precision: ± 1 % of the measured value

#### Barometric pressure

Range : 800 ÷ 1100 mbar  
Resolution: 0,1 mBar  
Precision: ± 2 mBar

#### Type K thermocouple

Range: 0 ÷ 1000 °C  
Resolution: 0,1 °C  
Precision: ± 1 % of the measured value (in Kelvin)  
Linearity: ± 1 °C (software linearization)

### General specification

#### Interface for programming management

Display touch screen (10")

#### Data download interface

RS232  
USB (on Flash Drive)

#### Operative Temperature

-10 °C ÷ +40 °C - 95% UR

#### Power supply

Main power [230Vac – 50Hz]



شرکت آلاپرداز محیط

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