

Isoflow 202 PRO

Isokinetic Flow Calculators



Three high accuracy sensors for the detection of differential, static and absolute pressure

Double sensor dedicated to the detection of stack and auxiliary device temperature

New high-resolution backlit graphic LCD display

Determination of the duct measuring grid and traverse points

Measurement and calculation of isokinetic conditions

Dedicated menus for EN-ISO 16911:2013, EN-13284, EPA 201A, ISO 9098, EPA-2H, EPA1, EPA 2H, EPA 4, EN-23210

EPA1 and ISO 16911 regulations for automatic SWIRL calculation

Direct interface to AirCube HE and AirCube Com2TH samplers for isokinetic real time sampling

Validation of calibration from reference accredited laboratory

Moisture content in stack gases using the psychrometric method (EPA 4) with WaterCheck system (optional)

Automatic swirl calculation using a three-axis transducer (optional) with real-time angle and flow calculation, without manual data entry

Portable calculator and data logger dedicated to isokinetic parameters, it delivers measurements and calculations on physical parameters as temperature, air velocity, differential and static pressure as well as barometric pressure measurements, with direct calculation of standardized volumes. It is equipped with three sensors for detecting operating pressures, thus obtaining high accuracy results at minimum pressure levels as well, in full compliance with ISO-EN 16911 and EPA M1 and M2 requirements. It features a program for calculating areas and number of traverse points, also for stacks with sections differing from the standard circular one. The graphic backlit display shows all the quantities detected in real time and the relevant calculations for setting sampling devices and accessories. All the performed measurements and relevant data can be saved and downloaded to a PC through the external SDC software via USB port. The Isoflow 202-Pro can be directly connected via RS232 with the Aircube samplers line (HE and

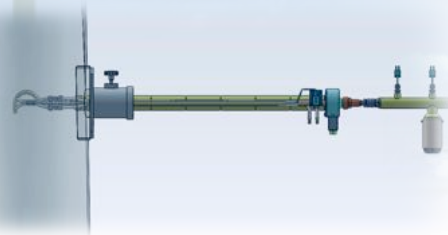
COM2TH), allowing the user to perform a real time isokinetic sampling in compliance with ISO-9096 protocol. A self-drive easy menu enables the user to display all the data that were entered and stored at that time as well as the changes made during sampling as well.





EPA 4 method

This method is dedicated to the evaluation of moisture content into stacks, for a correct evaluation of the gas density value. Unlike EN-14790 legislation, EPA method provides for a quick humidity check, defined as approximation method, so as to allow an approximate value to be entered before sampling. This is because generally the measurement of the moisture content in stack gases sampling, requires a long detection time. One of the allowed tests in the approximation method provides for the measurement with psychrometric or double bulb (dry/wet) system. To this purpose, the percent moisture content into the stack can be detected by the new Isoflow 202-Pro through automatic psychrometric measurement. AMS provides a device to be connected to Isoflow 202-Pro, through Water Check probe, to be used in line with the heated probe (without filter box). The device is able to detect and calculate the moisture content in a maximum time of 5 minutes. The relative humidity value can be displayed in real time and water concentration is automatically calculated. The Water Check kit is supplied separately from Isoflow 202-Pro isokinetic calculator.



Swirl control with reference angle calculation (SWIRL method).

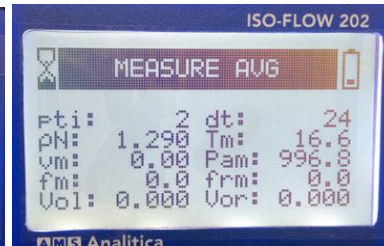
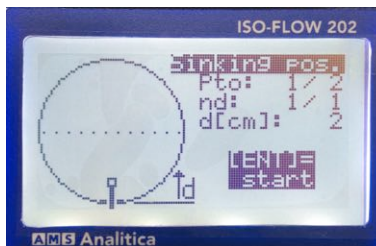
This measurement is used when unstable flow conditions occur inside the duct, in the different measurement points, causing the swirling. In order to obtain the most reliable result, EN-16911 standard describes how to calculate a correction factor in the measurement in the presence of swirls. In concrete terms, the velocity measurement probe is made to rotate trying to reach zero point stability and calculating the displacement angle. This procedure is provided for and described in more detail, in method EPA 1. In order to correctly carry out this measurement, a triaxial sensor was developed by AMS to be placed on the measuring probe and to be connected to Isoflow 202-Pro. The program allows air velocity, displacement angle and relevant correction factor to be simultaneously detected in real time. All without manually entering additional data. The angle calculation set must be purchased separately. The calculation program is already installed on Isoflow 202-Pro calculator and the user will simply have to connect the sensor through the USB port for automatic activation.

Real time isokinetic option

One of the features of the IsoFlow 202 Pro isokinetic calculator is the opportunity to connect at AirCube samplers in the two models COM2-TH and HE, via connection with the RS 232 serial port. This option allows you to operate in the sampling protocols, automatically adjusting the suction flow rate, according of emissions duct conditions. The entire sampling protocol and management phase is controlled exclusively by the IsoFlow 202 Pro meter, leaving the AirCube sampler the role of a simple suction component. Still in the memory of the IsoFlow, all the data processed at the end of the test will be reported and it will be possible to transfer them to a PC through dedicated software, for further data processing.



Through the various menus of the IsoFlow 202Pro calculator, there is the opportunity to view at display the exact probe traverse point positioning inside the duct. This option helps the operator to better understand the exact sampling point during the sampling phase. All data are available at display at the end of test cycle.



Isoflow 202 Pro



Specifications:

- Measuring range see technical sheet at next table
- Ambient operating range -10/+50°C
- Pressure detection: three sensors (Differential, Static, Absolute)
- Dimensions: 20x10x6 cm
- Weight: 700 grams
- Data output: bi-directional RS232 and USB port
- USB port for transducer connection for angle measurement
- Power supply: 12Vcc NiMH rechargeable batteries without

Isoflow 202-Pro calculator is supplied with: battery power supply/ charger, user manual in It/En language, connection pipes and cable for temperature sensor. A waterproof anti-shock carrying case and portable printer are optionally available.

Further technical specifications

Detected parameters	<ul style="list-style-type: none"> • Stack temperature (°C) • Differential pressure (mm/H2O) • Static pressure (mm/H2O) • Absolute barometric pressure (mbar) • Relative humidity (RH% - Psychrometric with sensor installed)
Power supply	<ul style="list-style-type: none"> • Internal batteries NiMH • External power supply through DC source(16<V<24) 1A
Available interfaces	<ul style="list-style-type: none"> • RS232C 9600/38400 baud, 1 stop, no parity • USB host
Environmental operating range	<ul style="list-style-type: none"> • Temperature -10°C % +50°C • Relative humidity 95% non-condensing
Weight	700 gr
Dimensions	20 x 10 x 6 cm
Thermocouple input measuring range	Depending on probe type and instr. setting (K, J, S)
Cold junction measuring range	-10..+85°C Resolution 0,05°C - Accuracy +/- 0,5°C
Barometric pressure sensor	<ul style="list-style-type: none"> • Measuring range (FS): 800..1100 mbar Resolution: 0,05 mbar • Accuracy: +/- 1 mbar
Static pressure sensor	<ul style="list-style-type: none"> • Measuring range (FS): +/- 1000 mm/H2O • Resolution: 0,1 mm/H2O • Accuracy: <ul style="list-style-type: none"> • 0.9% on scale (FS) 0..100 mmH2O with reading less than 100 mmH2O • 0.8% on scale (FS) 0..300 mmH2O with reading less than 300 mmH2O • 0.8% on scale (FS) 0..700 mmH2O with reading less than 700 mmH2O
Differential pressure sensor	<ul style="list-style-type: none"> • Measuring range (FS): 0-100 mm/H2O • Resolution: 0,01 mm/H2O • Accuracy: <ul style="list-style-type: none"> • 1% on scale (FS) 0..20 mmH2O • 0.5% on scale (FS) 0..50 mmH2O • 0.3% on scale (FS) 0..100 mmH2O

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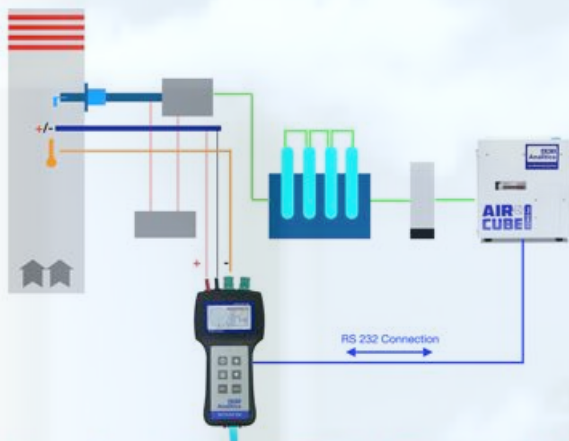


EPA Method 5 and its options

EPA Method n.5 provide using an isokinetic heated probe with filter holder, placed downstream and inserted in a heated box. The method may be used either with manual system either automatic system in compliant with requirements in ISO-9096 regulations. Sampling with the manual system will be performed once finished the duct evaluation (EPA1, EPA 2), with the corrected conditions to have a right test performance. Air flow measurements have to be performed using standardizing Pitot tubes, L or S format., whether they have been calibrated like standardized Pitot tubes. Duct pressure and temperature have to be measured to calculate effective volumetric mass of the gas, considering gas composition (CO₂, O₂, N). When expressing dusts concentrations on dry base, and/or when the concentrations have to be expressed in relationship to reference oxygen, humidity measurement and/or oxygen have to be performed near the sampling port.

Heated probe with external heated filter holder

The tube part between the nozzle and the filter (suction tube) has to be long enough to allow access in all sampling traverse points. The suction tube and the filter holder have to be at controlled temperature, which prevent any condensation of possible water drops or avoid difficult filtering related to acid gases with high dew point. Generally filters with 47/50mm diameter, with an associated flow rate from 1 m³/h to 10 m³/h. Sampling time on each point is between 30 and 60 minutes. As regarding filtering membranes, it is recommended using membranes not containing an organic binder because of the level of their impurities. Filtering membranes haven't performed particular interferences are the ones in quartz fiber or in glass fiber PTFE coated (maximum temperature of use at 280°C). In alternative also glass fiber filters may be used, but sometimes they might perform any kind of interferences caused by compost reacting to the same glass fibers (SO₂ compounds).



Emission sampling protocol based on US EPA M5 and CEN out-stack application
With AirCube COM2-TH sampler and IsoFlow 202 Pro calculator

600/IF202-PRO	Isokinetik parameter analyzer IsoFlow 202-Pro
600/SWR001K	Transducer kit for angle measurement (SWIRL)
600/WTC0001K	WaterCheck kit tu water content measurement
600/SDC001K	Software and Downloader SDC2000
600/PPC1500BNF	Isoflow 202 transport case
600/RCT57X50	Replacement Termic paper
600/SPRINT-S	Portable printer IsoFlow 201/202
600/TS00048	Silicon tubing 4x8 per IsoFlow200 1mt

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