



AMS[®]
Analitica
Air Monitoring Systems

EMISSION STACK MONITORING AIR SAMPLING SYSTEM

2017

INTRODUCTION		3
ISOFLOW 202-PRO	600/IF202-Pro	4/7
AIRCUBE™ COM2-ISO	600/A30002C-ISO	8-9
AIRCUBE™ HE-ISO	600/A30001HE-ISO	10-11
AIRCUBE® COM2 TH	600/A30002C-TH	12/15
AIRCUBE® BASIC	600/A30001B	16
AIRCUBE® BASIC EXTRA	600/A30001Q	17
AIRCUBE® HE	600/A30001HE	18-19
AIRCUBE® HE BASIC	600/A30001HEB	20
ISOKINETIC STACK PROBES		22/25
PARTICLES SIZE IMPACTORS		26
ISOKINETIC PROBES ACCESSORIES		27
VOC SAMPLING SYSTEM STACK GAS	600/ISS1400K	28-29
APPLICATION AND REGULATION		30/36
DIGITAL FLOW CALIBRATORS		37
DUST MONITORING SAMPLING SYSTEM	EN-13284/EPA 5-17	38/41
HEAVY METALS SAMPLING SYSTEM	UNI EN-14385	42-43
HYDROGEN CHLORIDE SAMPLING SYSTEM	EN-1911	44-45
WATER CONTENT SAMPLING SYSTEM	EN-14790	46
DIOXINS SAMPLING LINE TO PCDD-PCDF	UNI-EN 1948:2006	47-48-49
MERCURY SAMPLING SYSTEM	UNI EN-13211	50-51

An important element of industrial processes and related environmental impact monitoring is the control of stack emissions in atmosphere, a fundamental aspect for assessment of pollutants emitted in air during production cycles. To this end, AMS Analitica manufactures an entire line of sampling devices together with a range of accessories in full compliance with the requirements of the applicable legislation.

Portable sampler



AMS Analitica offers several options for all sampling procedures, from the basic manual sampler to the more complete automatic sampler capable of real-time control of all the sampling stages related to the emission conditions. The manual sampler works efficiently in stable sampling conditions with low turbulence and uniform conditions with respect to the different measuring points on the sampling axis. The automatic sampler works efficiently even in complex and non-homogenous. From the AirCube Basic to the fully integrated AirCube HE-Iso, AMS Analitica will offer the client solutions for every possible sampling application.



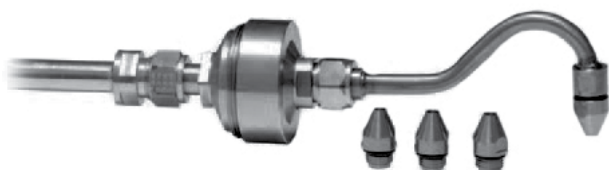
Isokinetic probes

Before approaching stack sampling, different problems should be addressed. First, the dimensions of the stacks to be monitored should be considered in order to facilitate the choice of the proper probe. Next, the general conditions of the stack should be verified in order to properly assess the isokinetic parameters before sampling. The applicable legislation distinguishes between two kind of stacks: stacks with low moisture presence and stacks with significant moisture presence. These two cases requires different probes and different kind of filter device placement (filter holder) whilst the sampling and isokinetic conditions assessment part is the same for both the two cases.



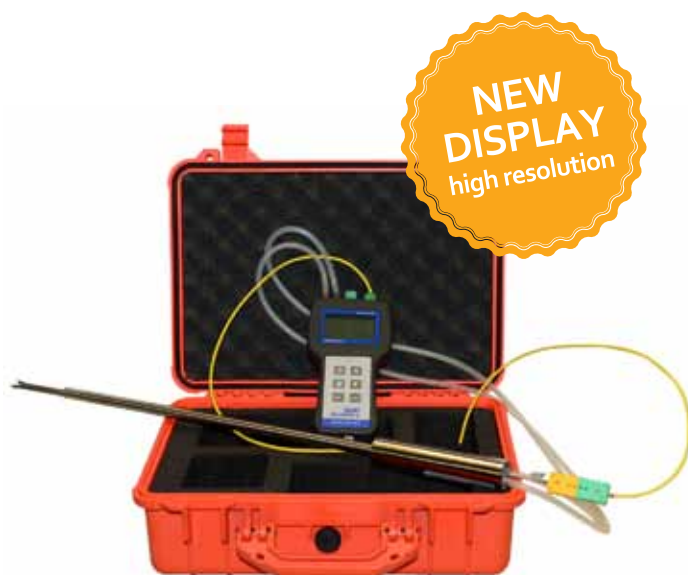
For moisture-free stacks an unheated probe with head-mounted filter holder may be used and placed within the stack. This procedure, provided for by EN and EPA regulations, shall not be used in the event of moisture presence due to moisture effects on samples. For stacks with significant moisture presence and high temperature it is necessary to use a heated probe with a filter holder device placed outside the stack in a thermo regulated box similarly to the probe. Moreover, this second option allows a further expansion dedicated to other sampling application, an expansion that

is not featured in suction system with unheated probe. The following parameters may be analyzed through heated probe sampling: heavy metals, inorganic acids, mercury, dioxins and furans and water vapor.

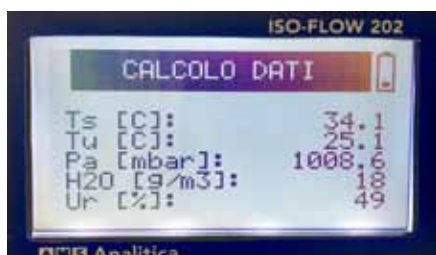


Portable calculator and data logger dedicated to isokinetic parameters (Vers. 16911)

- 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 Com2 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.
- Automatic calculation of the swirl factor in duct inner walls (EPA 2H)



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 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 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 RS232 and USB port. The Isoflow 202-Pro can be directly connected via RS232 with the Aircube samplers (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 EN14790 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.

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.

Specifications

Measuring range see technical

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 memory effect

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.

Other 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 • RS232C 9600/38400 baud, 1 stop, no parity
Available interfaces	<ul style="list-style-type: none"> • 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

- Measuring range (FS): +/- 1000 mmH₂O
- Resolution: 0,1 mmH₂O
- Accuracy:
 - 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

- Measuring range (FS): 0-100 mmH₂O
- Resolution: 0,01 mmH₂O
- Accuracy:
 - 1% on scale (FS) 0..20 mmH₂O
 - 0.5% on scale (FS) 0..50 mmH₂O
 - 0.3% on scale (FS) 0..100 mmH₂O

Come ordinare

600/IF202-PRO	Carrying case for IsoFlow 202-Pro and accessories
600/PPC1500BNF-IF	Data transfer and processing software for IF202-Pro
600/SPRINT-S	Replacement cable 5 m for temperature probe
600/SDC2000K	Silicon tube 4x8 for IsoFlow 202-Pro 1m
600/RTC0020	WaterCheck™ device for RH % calculation with accessories
600/RTC0025	Pitot tube S 750mm
600/RTC0010	Pitot tube S 2000mm
600/TS00048	IsoFlow 202-Pro isokinetic calculator
600/RCT57X50	Portable printer for IsoFlow 202-Pro
600/WTC0001K	Replacement cable 1500mm for temperature probe
600/SWR001K	Replacement cable 10 m for temperature probe
600/SD00102	10 pcs thermal paper pack for printer
600/SD00103	Transducer and accessories kit for SWIRL calculation
600/SD00104	Pitot tube S 1500mm
DO/LAT-K-6	Reference certificate for Pitot tube S, range 1-25 m/s (5 point increase)
DO/LAT-PITOT-25	Reference certificate for thermocouple K 6 Points range 0-1063°C
DO/LAT-PITOT-60	Reference certificate for Pitot tube S, range 25-60 m/s (5 point increase)

Other related IsoFlow 202-Pro applications

IsoFlow 202-Pro flow isokinetic calculator, can be directly connected through serial port to AirCube COM2-TH and AirCube HE portable samplers. This option allows the user to expand the use of the samplers through the automatic isokinetic mode in compliance with ISO-9096 requirements.

Thanks to this combined system, the user will be able to manage any stack sampling, without excluding any options, from the manual option to the fully automatic one. Moreover, AMS Analitica offers standard sampling kits, along with IsoFlow 202-Pro and AirCube sampler combination. These are two ready-to-use options, faithfully reflecting the two sampling options provided for in EN-13284, EPA 5 and EPA 17 methods.



Watercheck™ system for humidity and water content



AMS has developed an accessory which can be combined with the heated probe, exploiting the principle of the psychrometric measurement (DIN-50012) for measuring the relative humidity. An air flow is extracted at a known, constant flow velocity and convected to pass over the two temperature sensors; the sensitive part of one of the two sensors will be covered with a small sock, which will be wetted by capillarity with distilled water.

The maximum temperature tolerated at the measurement point, does not exceed 100°C. The test is performed over a time interval between 3 to 5 minutes; by connecting the two sensors to IsoFlow 202-Pro and entering the specific program, the display will show the value of the two temperatures, dry bulb and wet bulb temperature, the barometric pressure, the relative humidity content as well as the quantity of water expressed in grams per cubic meter [g/m³].

The system is connected to a heated probe which is kept to a constant temperature between 90°C and 100°C. Water-Check device is connected to the probe through leak-proof steel connectors. The water content value will be directly stored into IsoFlow 202-Pro device, for a correct calculation of system gas density.

How to order

600/WTC0001K	WaterCheck™ device for the calculation of stack moisture content
600/02FLA050GL	Replacement bottle 50 ML with socket GL32
600/SIR0750	Heated sampling probe 750 mm with connector for WaterCheck™
600/TF100	Single-point temperature controller for heated probe
600/CCTFSIR4	Connecting cable for heated probe length 4mt

Automatic Isokinetic Sampler 0,4-30 l/min

The device is capable to control the following parameters:

- Inside duct flow rate management in compliance with ISO-CEN 16911 regulation
- Flow rate calculation through pre selectors for PM10 in compliance with US-EPA 201A and EN-23210 regulations
- Stack traverse points calculation in compliance with ISO-CEN 16911 regulation and EPA1
- Manual setting with nozzle calculation
- Isokinetic suction in compliance with ISO-9096 and EN-13284 regulations
- Automatic calculation of turbulence effect (SWIRL) with three axis transducer (optional), angle and flow real-time calculation, no manual data input required
- Automatic calculation of the turbulence effect factor in the proximity of the pipe internal surfaces (EPA 2H)
- Selection of the applicable legislation directly on the display menu
- On board management of probe heating and filter holder compartment when using heated probes (available only with AC-220 powered sampler)

- Barometric pressure sensor:

- Measurement range (FS): 800..1100 mbar
- Resolution: 0,05 mbar
- Precision: +/- 1 mbar

- Static pressure sensor:

- Measurement range (FS): +/- 1000 mm/H2O
- Resolution: 0,1 mm/H2O
- Precision:
- 0.9% on scale (FS) 0..100 mmH2O with reading lower than 010 mmH2O
- 0.8% on scale (FS) 0..300 mmH2O with reading lower than 030 mmH2O
- 0.8% on scale (FS) 0..700 mmH2O with reading lower than 070 mmH2O

- Differential pressure sensor:

- Measurement range (FS): 0-100 mm/H2O
- Resolution: 0,01 mm/H2O
- Precision:
- 1% on scale (FS) 0..20 mmH2O with reading lower than 010 mmH2O
- 0.5% on scale (FS) 0..50 mmH2O with reading lower than 030 mmH2O
- 0.3% on scale (FS) 0..100 mmH2O with reading lower than 070 mmH2O



Isokinetic parameters sampler in compliance with ISO-9096 regulation capable of keeping stable the conditions of pipe sampling. With a capturing design, the AirCube Com2-Iso constant flow rate sampler offers new features for ranges and flow control and it is easy and versatile to operate.

A new proportional motorized valve, manufactured by AMS Analytica, allows an extremely accurate double-devices flow control and management, automatically and electronically compensating back pressure on the sampling line while adapting the sampling conditions to the modification of isokinetic conditions.



The AirCube Com2-Iso isokinetic sampler stands out also for the wide range of additional accessories fit both for environmental and ducted gaseous streams applications. The Com2-Iso model features a membrane suction pump, an automatic by-pass, a model 5 last generation control board. The device main application is for dusts and ducted gaseous polluting streams in compliance with ISO-9096 regulation.

The AirCube Com2-Iso features the same sizes of the other AirCube samplers, runs on 220V power or with PowerPackCom.

The new board with high resolution backlit plasma screen display allows the user to easily set the parameters and display them in real-time during sampling stages, e.g.: instantaneous and average flow of the period, instantaneous and average temperature of the period, instantaneous and average environmental temperature of the period, instantaneous and average barometric atmospheric pressure, partial sample volume and sampling time.

Moreover, the device displays on screen the development of the sampling through a time and suction flow based diagram. This option allows the user to check the proper execution of the sampling, validating the data through standard deviation calculation.

Technical features	
Flow	0,4-30 l/min
Pump range	up to 35 l/min
Volumetric control and normalization	by use of a dry meter
Flow control	by use of AMS Analitica's MassFlow
Electronic compensation	of back pressure
Flow settings	directly on keyboard
Pump type	membrane and single head
Back pressure compensation	500 mm/Hg, with electronic pressure control
Weight	9 Kg
Total liters reading	by use of a dry volumetric meter and display
Volume reading	display standardized
Temperature management	on display with 0,1 °C precision
Settings	At the standard temperature
Standard interface	provided with sequential device and solenoid valves for total dusts sampling TSP
Optional interface	Provided with weather sensor (optional)
RS 232 interface	For data and sampling parameters download
USB port	For data download and software updates
Remote control	Provided with GSM/GPRS device (optional)
Forced cooling system	working on 5 seconds cycles with aluminum heat sink
Dimensions	26x26x26 cm (WxDxH)
External structure	aluminum alloy painted with epoxy powders
Barometric pressure detection	sensor directly installed in the circuit
RS 232 data output	PC or portable serial printer connection



Device compliant with EN-12919:2001 CE compliance on Electromagnetic Compatibility 89/336/CEE referred to EN500811-1, EN6111-6-2, EN55014-1, EN 61326-1 and EN 602041:1197-12 (for instrumental safety tests) regulations.

Explore the advanced and innovative features of the new isokinetic parameters meter IsoFlow 202 Pro at page 4



How to order	
600/A30002C-ISO	Automatic isokinetic sampler AirCube Com-Iso
600/PP014A3COM2	Power Pack Cube Com2 (battery charger not included)
600/A18VISKPP	Battery charger with cable and connector
600/PF4700	47 mm membrane holder with filter holder box
600/SPRINT-S	Portable printer Sprint BB3
600/RCT57X50	Thermic paper spare for SprintB33 printer

Automatic isokinetic samplers



- Flow rate management within the pipe in compliance with ISO-CEN 16911 regulation
- Flow rate calculation through pre selectors for PM10 in compliance with US-EPA 201A and EN-23210 regulations
- Stack traverse points calculation in compliance with ISO-CEN 16911 regulation
- Manual setting with nozzle calculation
- Isokinetic suction in compliance with ISO-9096 and EN-13284 regulations
- Automatic calculation of turbulence effect (SWIRL) with three axis transducer (optional), angle and flow real-time calculation, no manual data input required
- Automatic calculation of the turbulence effect factor in the proximity of the pipe internal surfaces (EPA 2H)
- Selection of the applicable legislation directly on the display menu
- Setting of the side-stream flow value in the event of derivated sampling
- Setting of the constant value for stack turbulence measurement in compliance with EPA 2H criteria (as provided for by the EN-16911 regulation)
- Barometric pressure sensor:
 - Measurement range (FS): 800..1100 mbar
 - Resolution: 0,05 mbar
 - Precision: +/- 1 mbar
- Static pressure sensor:
 - Measurement range (FS): +/- 1000 mm/H2O
 - Resolution: 0,1 mm/H2O
 - Precision:
 - 0.9% on scale (FS) 0..100 mmH2O with reading lower than 010 mmH2O
 - 0.8% on scale (FS) 0..300 mmH2O with reading lower than 030 mmH2O
 - 0.8% on scale (FS) 0..700 mmH2O with reading lower than 070 mmH2O
- Differential pressure sensor:
 - Measurement range (FS): 0-100 mm/H2O
 - Resolution: 0,01 mm/H2O
 - Precision:
 - 1% on scale (FS) 0..20 mmH2O with reading lower than 010 mmH2O
 - 0.5% on scale (FS) 0..50 mmH2O with reading lower than 030 mmH2O
 - 0.3% on scale (FS) 0..100 mmH2O with reading lower than 070 mmH2O



The electronic management system allows extremely accurate flow control and adjustment thanks to the double-devices flow test. Moreover, the system automatically and electronically compensates the back pressure on the sampling line while adapting the sampling conditions to the modification of isokinetic conditions.

The new line AirCubeHE stands out also for the wide range of additional accessories fit both for environmental and ducted gaseous streams applications. The HE-Iso model features an intake suction pump with 6 m3 graphite palettes (10m3 pump is optional), a model 5 last generation control board. The device main application is for dusts and ducted gaseous polluting streams in compliance with ISO-9096, EN-13284 and EN-16911 regulation. The HE-Iso model features the same sizes of the other AirCube samplers and can be employed for all the sampling applications with high intake suction flow and back pressure.

The new board with high resolution backlit plasma screen display allows the user to easily set the parameters and display them in real-time during sampling stages, e.g.: instantaneous and average flow of the period, instantaneous and average temperature of the period, instantaneous and average environmental temperature of the period, instantaneous and average barometric atmospheric pressure, partial sample volume and sampling time.

Moreover, the device displays on screen the development of the sampling through a time and suction flow based diagram. This option allows the user to check the proper execution of the sampling, validating the data through standard deviation calculation.

The AirCube HE-Iso is the first sampler capable of managing two heated users (probe + filter holder heated box) without the help of thermo regulators, running the temperature control and heating up directly on display. This option further simplifies the sampling procedures and limits the weight and dimensions of the sampler. The suction line features a trap to prevent liquids accidentally sucked to enter the line. The trap activation is reported on the screen (by an alarm) and stops the sampling operations.

Isokinetic parameters sampler in compliance with ISO-9096 EN-13284 and EN-16911 regulations capable of keeping stable the conditions of pipe sampling. With a captivating design, the AirCubeHE-Iso constant flow rate sampler offers new features for ranges and flow control and it is easy and versatile to operate.

New sampler connectors for temperature, differential pressure, air inlet, heating systems and power switch.

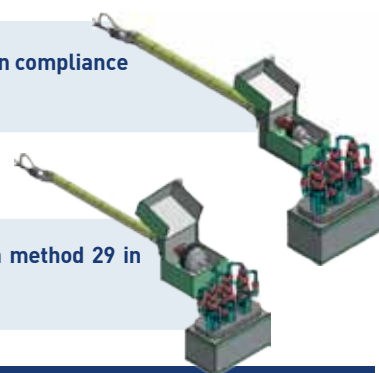


Technical features	
Flow	5-60 l/min (110 l/min with 10m3 pump)
Pump range	up to 6m3/h (10m3 optional)
Volumetric control and normalization	by use of a dry meter
Flow control	by use of AMS Analitica's MassFlow
Pressure sensor measurement range	0-100 mm/H2O (+/- 1mm/H2O Res. ->0,01 mm/H2O
Temperature sensor measurement range	Depending on the probe model (K, J, S) Res. 0,03 °C
Barometric atmospheric pressure sensor measurement range	500-110 bar (RES. 0,05 mbar)
Electronic compensation	of back pressure
Flow settings	directly on keyboard
Rotary pump	6m3/h model (10m3/h model optional)
Back pressure compensation	600 mm/Hg, with electronic pressure control
Weight	16 Kg
Total liters reading	by use of a dry volumetric meter and display
Temperature control	on display with 0,1 °C precision
Volume reading	display standardizes
Temperature control	on display with 0,1 °C precision
Temperature control outputs on the sampling line	4
Users	Adjustment of 2 heating users for probe and filter holder box
Users by temperature	4
Protective device	liquid suction in the intake suction line with alarm
Settings	At the standard temperature
RS 232 interface	For data and sampling parameters download
USB port	For data download and software updates
Remote control	Provided with GSM/GPRS device (optional)
cooling system	working on 5 seconds cycles with aluminum heat sink
Dimensions	27x27x cm (WxDxH)
External structure	aluminum alloy painted with epoxy powders
Barometric pressure detection	sensor directly installed in the circuit
RS 232 data output	PC or portable serial printer connection
Compliance	EN-12919:2001

The probe shown in the picture is a typical application for metals, mercury, hydrogen chloride in compliance with EN 1911 - EN: 13211 - EN:14385 regulations 47 mm filter holder.



The probe shown in the picture is a typical US-EPA application for metals with method 29 in compliance with EPA5 and EPA17 with 100 mm filter holder.



How to order

600/A30001HE-ISO	Automatic isokinetic sampler AirCube He-Iso
600/A30010HE-ISO	10m3/h automatic isokinetic sampler AirCube He-Iso
600/SPRINT-S	Portable printer for Isoflow and Plus series
600/STC02K	Thermocouple sensor with 2m cable for He-Iso users
600/STC05K	Thermocouple sensor with 5m cable for He-Iso users
600/TS00048	4x8 Silicone pipe for IsoFlow201 and HE Iso 1m

Constant flow portable sampler

- Light, compact and weight not over 7,0 kg
- Flow range between 0,4 and 30 l/min with a single dynamic cycle
- No useless adapter for working at low flow rates
- Long-lasting battery pack guaranteeing extended sampling sessions
- Viton® membrane single head pump
- Installed volumetric meter in compliance with applicable legislation
- Compliant with RoHs-2006 and UNIEN. 12919:2001 regulations
- Two-port connection with PC or isokinetic parameters control unit
- USB drive for data download and board firmware update



The era of samplings with endless settings is over with the new AirCube™ COM2 TH portable sampler. With just few operations in the user-friendly main menu the sampler is immediately ready for a new sampling process.

Inhalable particles, air dispersed fibers, toxic gasses and particles in emission: the AirCube™ COM2 TH sampler is the universal solution for every necessity. The age of manual by-pass or inaccurate and unhandy calibrated orifices for high and low flow is over. You just need to set the desired flow and then let the sampling begin. With the flow range included between 0,4 and 30 l/min in a single dynamic scale, the AirCube™ COM2 TH has no competitors! The first and only ultra compact, the AirCube™ COM2 TH sampler is the true compact in the category with only 24 cm (per side) and 27 cm (height) but with inside the dry volumetric meter as provided for by all the applicable legislation.

Unique in its category, equipped with a membrane pump powered by 12V cc elevated flow range and back pressure compensation over 2200mm/H2O

The AirCube™ COM2 TH constant flow sampler belongs to the second generation of portable successful line of samplers manufactured by AMS Analytica.

New for its compactness, lighter in weight, has an exclusive proportional valve for a precise suction flow adjustment. The AirCube™ COM2 TH sampler is adjustable with operational flow included in a single dynamic range between 0,4 and 30 l/min without the assistance of by-pass valves and without using particular regulators for operation in the low-flow range. Unique in its category, the AirCube™ COM2 TH sampler is powered by rechargeable batteries and directly from the electrical power network without the use of external power packs.

**COMPATIBLE WITH
IsoFlow 202-Pro**



The new microprocessor board with high-resolution back lit display allows an easy and intuitive data setting and immediate readings during sampling stages with real time display of all related data such as:

- Instantaneous and average flow of the session
- Instantaneous temperature at the meter and average session period
- Instantaneous environmental temperature and average session period
- Instantaneous barometric atmospheric pressure and average session period
- Partial volume sample
- Sampling time

Furthermore, the display shows the progress of the sampling graphically distributed on suction flow and time basis. This option allows the verification and validation of the sampling validating the data with the calculation of the standard deviation.

Technical features

- Flow adjustment range 0.2-30 liters/minute
- Maximum operational flow 28 liters/minute (tested with 47 mm Fiberfilm filter 1800 mm/H2O)
- Maximum attainable compensation: 2200 mm/H2O
- Controlled electronic compensation of loss of load
- Single head membrane aspiration pump
- Pulse attenuator with pressure control incorporated
- Automatic flow regulation of the aspiration flow with patented proportional valve
- Sampling time and volume setting directly from the keyboard
- Sampling flow setting directly from keyboard
- Instantaneous detection and calculation of the average for:
- Dry gas meter temperature
- Environment temperature
- Atmospheric barometric pressure
- Aspiration flow
- Wind speed and direction (when the sensor has been installed)
- Graphic viewing of the sampling progress with calculation of the standard deviation
- Remote control by way of GSM/GPRS data card chance (Optional)
- Sequential group management with solenoid valves for particles and gas chance
- Total volume detectable from the integrated volumetric counter
- Setting of the standardization temperature chance
- PC board conformed to the RoHS-2006 norm requirements
- Conforms to the EN-12919:2001 norm
- Dual power feed with rechargeable batteries or with 220V standard network electrical power without external power packs or transformers



Physical Features

- Weight 8 Kg.
- Dimensions: 245x245x270 mm (LxDxH)
- EC Conformity on Electromagnetic Compatibility 89/336/EEC referred to the EN 50081-1, EN 6111- 6-2, EN 55014-1, EN 61326-1 end EN 60204-1:1997-12 norms regarding electrical safety tests of the device
- 12V DC power feed with Power Pack Com battery pack (Optional 600/ PP014A3COM2)
- Electrical power feed from the 220V / AC network with standard cable

It is possible to connect 8 place modules to the AirCube™ COM2 TH for sequential particles sampling and the new sequential gas sampling device with the inclusion of GasCheck Basic absorbent sampling tubes.



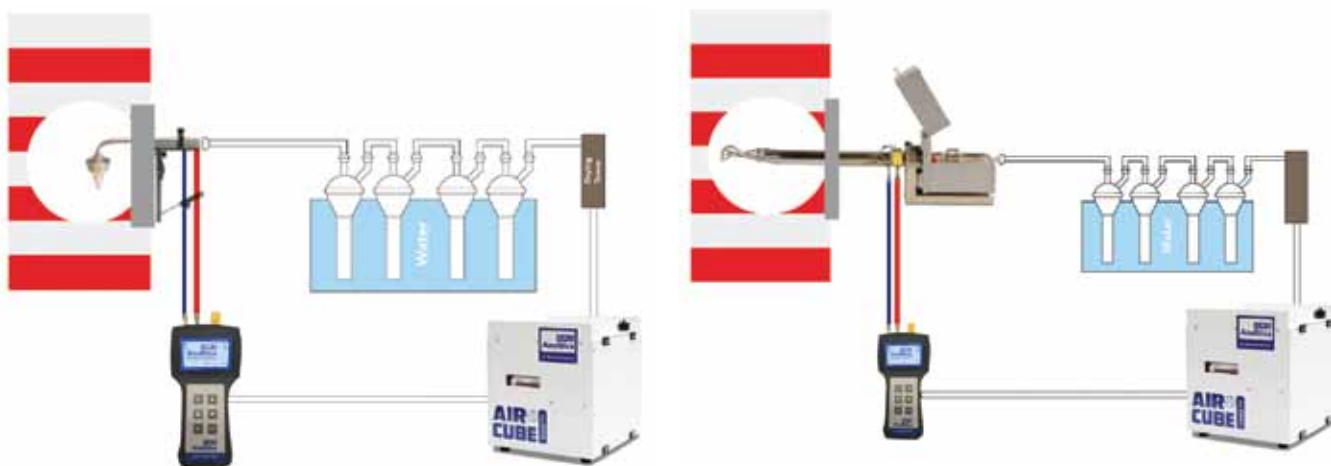
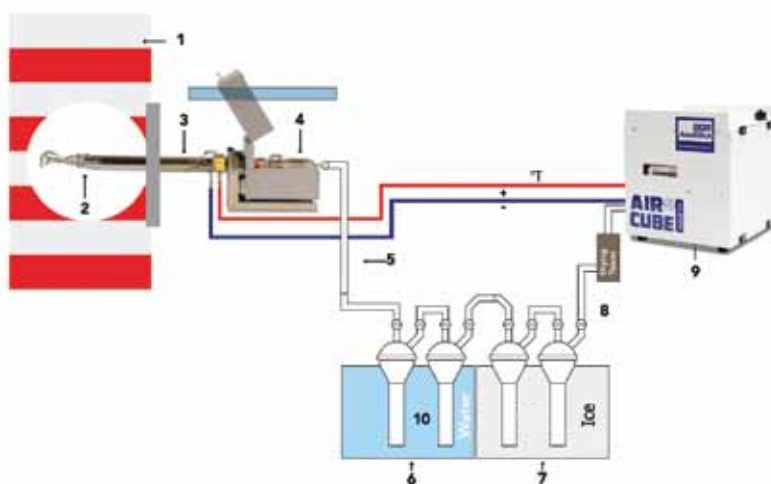
AirCube COM2-TH sampler may be matched with the IsoFlow 202 Pro device for measurement of isokinetic parameters for automatic ducted gaseous streams sampling in compliance with the requirements of ISO-9096, EN-13284 and EN/ISO 16911. The devices are connected through the RS232 interface with full control of stack sampling functions such as: suction points control, sampling nozzle automatic control, flow rate and proper intake suction flow calculation.

Sampling examples, in compliance with the criteria set forth by the current applicable laws, are shown below. Please refer to our catalogue for ducted gaseous streams sampling to learn about the features of the IsoFlow 202 Pro device for flow rate measurement of isokinetic parameters



Sampling example in compliance with EN-13284 regulation with modular system IsoFlow + Sampler

- 1: pipe/stack
- 2: nozzles with pitot "s" pipe
- 3: heated probe
- 4: heated box with filter holder
- 5: gas condensation system
- 6: refrigerator with stack frost circulation pump
- 7: refrigerate container
- 8: Silica gel trap
- 9: isokinetic sampler
- 10: impingers set for the refrigerate container



How to order

600/A30002C-TH	Campionatore AirCube Com2- TH
600/PP014A3COM2	Power Pack Cube per AirCube Com2 con Carica Batterie
600/AFBAR01	Sensore pressione barometrica atmosferica
600/EV001P	Modulo sequenziale 8 posizioni per polveri con cavo
MT/190X3	Cavalletto di supporto per sequenziale
600/GCB12001K	Gruppo sequenziale per fiale adsorbenti GasCheck Basic 12P
600/GRMET001K	Gruppo sensori meteo (velocità+direzione) con kit montaggio
600/AFPUF1001GSM	Modulo Interfaccia GSM (scheda SIM non fornibile)
600/SDC001K	Software SDC2000™
MT/5001B	Cavalletto in alluminio tipo leggero
600/PF4700	Porta Membrana completo di cassetta 47mm
600/SPRINT-S	Stampante portatile per Isoflow, Serie COM ed HE
600/RCT57X50	Confezione 10 Rotoli carta termica per stampante
600/GRS001UR	Sensore Umidità Relativa precisione 1,5%
600/LVUSEPAPM001K1	Frazionatore PM10 completo flusso 16,7 litri/min US EPA
600/LVUSEPAPM25K	Impattore Wins per PM2,5 16,7 l/min US-EPA

VISIT OUR WEBSITE
FOR THE LATEST NEWS
OF OUR PRODUCTS

www.amsanalitica.com

Light and compact portable sampler, fundamental for accurate sampling

- Light and compact 26x26x26 cm with weight less than 8 Kg
- New series with transportable battery pack that can be integrated within the device
- 5 hours stand-alone sampling at max load with extra PowerPack batteries
- Compliant with UNI EN 12919:2001 regulation
- Single head intake suction pump
- Battery power with PowerPack
- Sampling temperature monitoring at meter
- Back pressure compensation 500 mm/Hg
- Maximum sampling flow 22 l/min



Flow and volumetric compensation easy manual setting, temperature detection at the meter with digital thermometer. Maximum flow 25 l/min.

AirCube Basic: fixed installed sampler for environmental sampling of total dusts, inhalable dusts, gasses and air dispersed harmful toxic vapors and stack samplings.

The strong and compact container is made of light aluminum alloy and painted with epoxy powders and shelters the device from the most severe weather conditions.

The device is also provided with a single head membrane pump and with a pulsation compensator capable of monitoring a flow from 0,2 to 25 l/min with free flow opening and compensating back pressure up to 500 mm/Hg within the real flow rate.

The device features a temperature controller at the meter, a by-pass for suction flow adjustment and control, a double flow meter (for high and low flows) for flow rate control and a dry volumetric meter.



The AirCube sampler can also be powered by an integrated PowerPack Cube series battery pack for samplings in sites where outlets are located far from the sampler, keeping the flow constant for 5 hours of maximum flow rate sampling.

AirCube Basic is supplied with user guide in Italian and with a 150 cm 10x18 silicone suction pipe.

How to order

600/A30001B	AirCube Basic Sampler
600/PP014A3	PowerPack Cube for basic model (battery charger optional)
600/A12VISKPP	Battery charger for PowerPack with cable and connector
600/PF4700	47 mm Inox Membrane holder with cassettes
MT/5001B	Lightweight tripod with Nano pincers



Portable sampler

- Single head suction pump with 500 mm/Hg compensation
- Pump operational range: from 0,8 to 30 l/min with free flow opening
- Sampler operational range: from 1 to 25 l/min
- Volumetric meter: dry with max. flow rate 2,5 m³/h
- Power: 220V/50 Hz, 150 Watt / 12 Vcc with PowerPack Cube
- Dimensions: 26x26x26 cm (no PowerPack Cube)
- Weight: 10 Kg (no PowerPack Cube)
- Supplied with user guide in Italian and with a 150 cm 10x18 silicone suction pipe



AirCube Basic Extra sampler is the next step after the Basic model with an additional digital board capable of monitoring sampling conditions such as:

- suction flow;
- total volume sample, absolute and standardized
- sampling temperature at the meter
- sampling time settings with sampling stages saving

Provided with a single head membrane pump with a pulsation compensator capable of monitoring a flow from 0,8 to 30 l/min with free flow opening and compensating

back pressure up to 700 mm/Hg within the real flow rate comprised between 1 and 30 l/min. All the sampling parameters like suction flow, sampling time and normalization temperature may be set on keyboard. The new AirCube Basic-Extra sampler may be powered by an integrated PowerPack Cube series battery pack for samplings in sites where outlets are located far from the sampler, keeping the flow constant for 6 hours of maximum flow rate sampling.

Compliant with UNI EN 12919:2001 adopted with D.L. n.25 02/02/2002

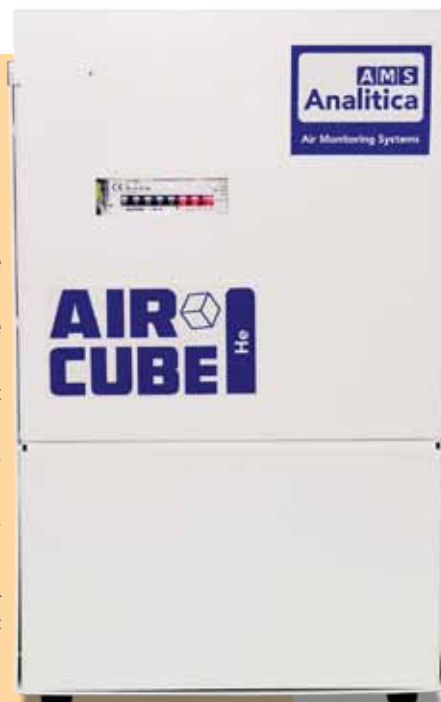
CE compliance: EN 60204-1:1997, DIR. 89/336/CEE

**How to order**

600/A30001Q	AirCube Basic-Extra Sampler
600/PP014A3BE	PowerPack Cube for Basic Extra (battery charger optional)
600/A12VISKPP	Battery charger for PowerPack with cable and connector
600/PF4700	47 mm Inox Membrane holder with cassettes
MT/5001B	Lightweight tripod with Nano pincers

Portable atmospheric sampler

- High yield vacuum-proof pump from 6m³/h
- Electronically regulated constant flow with a ± 2 precision
- Operational range comprised between 50 and 60 l/min
- Sample volume monitoring with integrated volumetric meter with a ± 2 precision
- Sample flow monitoring with Mass-Flow device with a ± 1 precision
- Atmospheric barometric pressure sensor and double temperature detection sensor: one for the monitoring at the meter and another for monitoring at the sampling point
- Setting and monitoring for standard deviation of sampling sequences chance, to sample time or volume, for a single day or up to 16 days
- Possibility of modifying the program conditions during the sampling stages and reset them
- Setting of the instrument controls including seal test and monitoring of magnitude measurement sensors
- Predisposed for connection with pair of sensors for the detection of wind speed and direction
- RS232 port for data download on the AirNet2 software and the connection to the serial printer. Interface for connection with flow rate meter IsoFlow 202-Pro for the automatic monitoring of the isokinetic conditions (optional)
- Predisposed for utilization with GSM/GPRS modem (optional modem)
- Sample data saving when a power lack happens with sampling session restart, when power comes back with event registration of the final recap.



The AirCube™ HE portable constant flow atmospheric sampler is suitable for air quality monitoring applications in conformity with the norms regarding PM10, PM2.5 and TSP aerial-dispersed ne particles.

The structure and modularity of the sampler allow the expandability of its utilization in environmental applications to the monitoring of exhaust emissions. Practical and versatile, the AirCube™ HE sampler may be equipped with different configurations for automatic and sequential sampling.

**COMPATIBILE CON
IsoFlow 202-Pro**



The AirCube™ HE sampler is able to satisfy the requirements foreseen by the EN-12341 and EN-14907 norms for PM10 and PM2.5 aerial-dispersed particles sampling, under the ow conditions foreseen of 38 liters per minute and is able of carrying out emissions samples both in the manual and in automatic mode thanks to the possibility of connection with the isokinetic parameter meter IsoFlow 201



Simple to use, the Air-Cube™ HE sampler is completely managed by microprocessor offering to the user setting chance the sampling parameters directly from the keyboard. Suction flow adjustment carried out by way of a motorized proportional valve and is able to manage changes in flow with extreme rapidity and accuracy.

The AirCube™ HE sampler is equipped with flow regulation with mass flow. This option offers maximum precision and guarantee of an extremely accurate data sampling. The AirCube™ HE sampler is able to manage external units for PTS EV Plus sequential sampling and for PM10/2.5 fine particles, DustCheckP.

Technical features	
Dimensions	28x28x40cm mm (LxDxH)
Weight	16 Kg
Electrical power feed	220V-AC

CE compliance: EN 60204-1:1997-12, DIR.89/336/CEE

The sampler is furnished complete with Interface for sequential groups PTS, Interface for wind speed and direction sensors (sensors excluded), RS232 cable, AC cable, SDC 2000 software to elaborate data, user manual and calibration and inspection report.

How to order	
600/A30001HE	Portable sampler AirCube HE Basic
600/AFPUF1001GSM	Module GSM (SIM excluded)
600/A3HS00010	Anti-rain shelter for HS and HE models
600/SPRINTB33	Portable Printer
600/RSIF201X	IsoFlow 201 Isokinetic parameter measurement interface

Sequential module DustCheck P for PM10 and PM 2,5 dusts sampling matched with AirCube HE sampler

AirCube HE sampler may be connected to a sequential sampling device capable of PM10 and PM 2,5 sampling up to 16 filters. The system features a fit compartment within the environmental mobile laboratories and the monitoring cabinet instead of being placed within devices for external use.

DustCheck P is the mechanical part of the DPM16 sampler, placed in a handy support carter to avoid obstructions, that still features all the technical and qualitative characteristics necessary for external use. The AirCube HE, connected to the sequential module through screened cable, manages and controls all the sampling stages including flow and intake suction conditions control and management of the 16 sampling filters.



DustCheck16P module features

- Max. 16 sample filters in a sequence
- Protective aluminum carter treated with epoxy powders
- Sampling down tube insert
- Operates in compliance with CEN (EN-12341) or with US-EPA
- Supplied with cables for the connection to AirCube HE sampler

Come ordinare	
600/MCCDSC1601P	Portable sequential module DustCheck P
600/MCCDSCDT01M	Section of modular connection pipe with 1 m. impactor
600/LWSPM10.25_2	PM10 impactor certified TUV-EN-12341
600/LWSPM25	PM2,5 impactor certified TUV-EN-12341
600/PM10-EPA01K	US EPA pre selector for PM10 dusts – 16,7 l/min

Portable constant flow sampler

- 3-45 litri per minuto
- Elevata compensazione delle perdite di carico
- Utilizzabile per campionamento polveri PM10 in ambiente ed inquinanti in emissione da camino
- Pompa con dispositivo a doppia testa

AirCube HE-Basic portable sampler supplied with electronic sampling flux, with the option to compensate load losses on filter moreover than managing sampling phases independently. The device is built in with a suction system membrane with double head, AirCube HE-Basic has a usability flow range among 5 and 55 liters per minute, qualified for particulate dusts sampling PM10 and PM2,5 in compliant with EN-12341, EN-14907 and EPA see40 normative.

The sampler is up to reveal through electronic board:

- Flux liters per minute in real time
- Total normalized sampling volume
- Atmospheric barometric pressure
- Load loss on sampling filter
- Counter temperature
- Environmental temperature
- Wind speed and direction (when the optional sensor has been installed)
- Standard deviation calculus with control graph
- RS 232 to data download and sampling parameters
- USB key support to download data and transferring to PC
- Remote control w GSM/GPRS device (optional sensor)

The sampling device supplied with StackFlow Pro support to download isokinetic parameters, up to expand usage of isokinetic automatic samplers, with sampling control parameters in compliant with ISO-EN 16911, EN-13284-1, EPA 1, 2, 2H, 5, 17 norms.



Technical features

Flux	among 5 to 55 liters per minute
Usability	pump range up to 5 m3 per hour
Volumetric flow control	with automatic load losses compensation and through critical orifice
Membrane pump	kind double head
Load losses compensation	600 mm/Hg with electronic control
Flow display	direct
Weight	14 kg
Total liters reading	by way of dry gas volumetric counter and display
Temperature control	at display with precision 0.1° C
Controllo temperatura	a display con precisione 0,1°C
Setting normalization	temperature chance
Dimensions	27x27x42 cm (LxDxH)
External case	in aluminum alloy painted with epossidic powders
Compliant	to the EN-12919:2001 norm

How to order

600/A30001HEB	Portable sampler AirCube HE Basic
600/A3HS00010	Anti-rain shelter for models HS and HE
600/AFPUF1001GSM	Module GSM (SIM excluded)
600/RSIF201X	IsoFlow 201 Isokinetic parameter measurer interface
600/ISM001K	Weather sensor interface
600/PF4700	47mm membrane holder with box
600/IGS001K	Sequential group interface
600/RCT57X50	Thermal paper for portable printer pckg. 10 pcs
600/SPRINTB33	IsoFlow and Serie Plus Portable Printer
FAN/MFQ047	47mm Quartz fibers filter without bound pckg. 25 pcs
NFS/GF1-47-100	47mm Glass fiber filters GF1 pckg. 100 pcs
NFS/GF2-47-100	47mm Glass fiber filters GF2 (Eq. EPM2000) pckg. 100 pcs

Systems and
Accessories
for stacks sampling
protocols

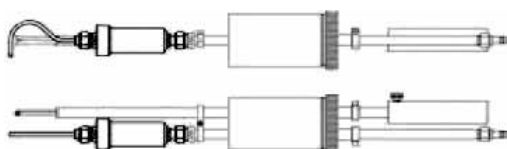


Isokinetic probes for sampling emissions, manufactured by AMS Analitica, have been designed and implemented in accordance with applicable regulations. They are mainly made of stainless steel AISI 316 and are provided with accessory parts and titanium and glass components. They are available in four configurations: three for samplings with the filtration device placed within the stack and one configuration for samplings with heated probe and filtration device housed in a hot box outside the stack.

The fourth option provides also the necessary accessories for the use of the probe for applications such as Dioxins (EN-1948), Heavy Metals (EN-14385), Hydrochloric Acid (EN-1911), Mercury (EN-13211) and Water Content (EN-14790).



Standard Isokinetic probe with separate sampling and measuring Pitot tube



The standard probe consists in a double line, one for sampling and one for the measurement of isokinetic conditions (S-type Pitot tube) in combination with Iso-Flow 202 measuring device; the two lines are kept together by means of a support that allows the probes to be placed inside the stack at the same time and perfectly parallel and inserted in a holder with a 89 mm diameter standard flange.

This option allows the user to replace one of the two probes with other probes having different lengths at any time. The sampling probe will have to be associated to a sampling assembly including filter holders (600/APS00200, 600/APS00201) or

membrane filter holders (600/PF00107A, 600/PF00107B) as explained below. S-type Pitot tubes are available in standard format in three lengths: 750, 1500, 2000 mm. They are constructed in compliance with current regulations. The Pitot tube is housed in a support containing the thermocouple for temperature detection and can be easily connected to the acquisition and sampling devices through quick-connect couplings. These are protected by a shock absorber to prevent breakage caused by accidental drops during transport.

How to order

600/SI00109	Standard isokinetic probe with 1500mm flange
600/SI00110	Standard isokinetic probe with 750mm flange
600/SI00200	Standard isokinetic probe with 2000mm flange

Isokinetic probes need to be complemented by one of the following sampling kits: 600/APS00200, 600/APS00201, 600/PF00107A, 600/PF00107B.

Integrated Isokinetic probes for stack emission sampling

EN 13284-1 standard provides two different options for stack sampling, depending on emission conditions. The first option consists in sampling with a standard unheated probe with filter holder placed into the stack perpendicular to the emission flow. This option is recommended for chiefly dry-basis emissions and not excessively high temperatures. Sampling with filter holders not perpendicular to the sampling flow is also allowed; it should be reminded in this case to take into consideration all depositions upstream of the filter as part of the sample. The probe has been designed and implemented to strictly comply with UNI-EN13284-1 standard. This European Standard specifies a reference method for the measurement of low dust concentration in ducted gaseous streams in concentrations below 50 mg/m³ standard conditions. This method has been validated with special emphasis around 5 mg/m³ on an average half hour sampling time. More generally, it may be applied to gases emitted from stationary sources, and to higher concentrations. If the gases contain unstable, reactive or semi-volatile substances, the measurement depends on the sampling and filter treatment conditions. Flow rate and temperature measurements can be carried out using IsoFlow202 measuring device, where the parameters of the above mentioned standard have been configured; this allows the user to prepare each single sampling in a thorough and effective manner. The probes are made in stainless steel AISI 316 and are supplied with a standard S-type Pitot terminal for use with 47 mm filter holder (filter holder and nozzles must be ordered separately). format in three lengths: 750, 1500, 2000 mm. They are constructed in compliance with current regulations. The Pitot tube is housed in a support containing the thermocouple for temperature detection and can be easily connected to the acquisition and sampling devices through quickconnect couplings. These are protected by a shock absorber to prevent breakage caused by accidental drops during transport. Isokinetic probes need to be complemented by one of the following sampling kits: 600/APS00200, 600/APS00201, 600/PF00107A, 600/PF00107B respectively, the first two with basket, thimble and 37mm diameter filter holder multiple device; the other two kits with 47mm filter holder.

How to order

600/SMT0015.1	1500mm long integrated probe with Pitot tube and temperature probe
600/SMT0030.1	3000mm long integrated probe with Pitot tube and temperature probe
600/SF00100	Support for universal flange integrated probe

Filter holder kit for in-stack sampling

Two different types of filter holders are available for stack sampling mode. They are both made in AISI 316 material and provide guarantee and versatility to the sampling.

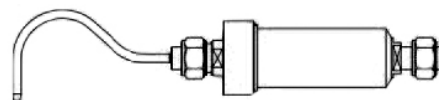
Multiple filtering device (37mm diameter) for baskets, thimbles and filters

The kit consists in a complete set including AISI 316 stainless steel elements that can accommodate 37 mm filter holder, thimble holder and baskets; it can be also connected to the stainless steel stack probe sampling tube.

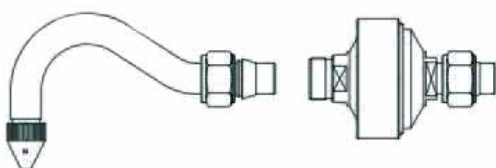
The scope of delivery also includes a set of three curved nozzles (diameter 4/6/8 mm) or in alternative nozzles with threaded end to allow the insertion of interchangeable nozzles, distinguished by different codes. The device has been designed to comply with international isokinetic sampling standards and is entirely made in stainless steel AISI 316; it requires no seals as it uses metal seal couplings for connections between nozzles and the probe body. The filter holder device includes a set of accessories allowing high performance on-site operation.

The complete set includes a 37 mm diameter flat membrane holder, thimble holder and basket holder.

The filter holder assembly is available in two versions: one version (600/APS00201) provides a set of three curved nozzles with inlet diameter of 4, 6, and 8mm. supported by a sealed coupling for insertion into the filter holder. The other version (600/APS00200) provides a filter holder with curved threaded end for the connection to a set of interchangeable nozzles (4, 5, 6, 7, 8, 9, 10, 11, 14, 18 mm.). This option allows you to have a complete range of nozzles at a lower cost. Both filter holder assemblies can be mounted on standard cold probes, integrated and heated probes. Each filter holder assembly comes equipped with three baskets for quartz or glass wool, a set of spare seals for filter holder body and an adjustable wrench for tightening.

**How to order**

600/APS00200	Filter holder assembly with interchangeable 37mm nozzles and basket holder
600/APS00200B	Filter holder only with supports, no curved nozzles
600/APS00201	Filter holder assembly with curved nozzles
600/UC0104/118	Set of 10 nozzles 4-18

Filtering device (47 mm diameter)

The complete assembly consists in components made in stainless steel AISI 316 that can house 47mm membrane filters and can be connected to the stainless steel sampling tube.

The scope of delivery includes a set of three curved nozzles (diameter 4/6/8 mm) or in alternative nozzles with threaded end to allow the insertion of interchangeable nozzles, distinguished by different codes.

The scope of delivery also includes a set of three curved nozzles (diameter 4/6/8 mm) or in alternative nozzles with threaded end to allow the insertion of interchangeable nozzles, distinguished by different codes. The device has been designed to comply with international isokinetic sampling standards and is entirely made in stainless steel AISI 316; it requires no seals as it uses metal seal couplings for connections between nozzles and the probe body. The filter holder device includes a set of accessories allowing high performance on-site operation. The complete set includes a 37 mm diameter flat membrane holder, thimble holder and basket holder.

The filter holder assembly is available in two versions: one version (600/APS00201) provides a set of three curved nozzles with inlet diameter of 4, 6, and 8mm. supported by a sealed coupling for insertion into the filter holder. The other version (600/APS00200) provides a filter holder with curved threaded end for the connection to a set of interchangeable nozzles (4, 5, 6, 7, 8, 9, 10, 11, 14, 18 mm.). This option allows you to have a complete range of nozzles at a lower cost. Both filter holder assemblies can be mounted on standard cold probes, integrated and heated probes. Each filter holder assembly comes equipped with three baskets for quartz or glass wool, a set of spare seals for filter holder body and an adjustable wrench for tightening.



How to order

600/PF00107	Membrane filter holder (47mm) (nozzles excluded)
600/PF00107A	Membrane filter holder (47mm) with fixed nozzles (4,6,8)
600/PF00107B	Membrane filter holder assembly (47mm) with interchangeable nozzles
600/UC0104/118	Set of 10 nozzles 4-18

Single-tube probe for dust sampling in small-size stacks

When sampling stack emissions, small diameter ducts are becoming more and more commonly dealt with. The emissions are chiefly from craft processes or more simply from combustion ducts like methane or wood boilers. In these conditions, standard equipment like integrated probes (Pitot tube in combination with sampling tube) and supporting flanges cannot be used due to their dimensions and handling as well as to the little practicality of the whole nozzles-filter holder system.

It often happens that this kind of exhaust systems do not even have supporting flanges but simple openings that oblige users to make use of all their practical sense and dexterity.



AMS Analitica has developed a system that allows you to sample in small-size stacks without problems, using a practical support, easily adaptable to all types of inlets.

By means of a simple 90° coupling, the support keeps the sampling tube perfectly perpendicular to the duct and two guides help the tube slide inside the duct during collection phases.

The probe is equipped with a filter holder placed perpendicularly to the emission flow, allowing dust sampling to be carried out according to EN-13284-1 Regulation, Section 1, Manual dust sampling at low concentrations. The complete assembly includes probe support, sampling tube, stainless steel 37mm filter holder and a set of three nozzles directly mounted upstream of the filter.

A double tube support is optionally available; it can accommodate the sampling tube and the S-type Pitot tube. A filter holder support for 47mm membrane filters is available as an accessory; it can house the same nozzles as the 37mm ones.

How to order

600/SPR0001K	MiniProbe with support and 37mm filter holder with nozzles
600/SPR0001K-A2	Mini Probe length=500 with 37mm filter holder
600/SPR0001K-A1	Support for MiniProbe for small-size stacks
600/PF13284-47K	Filter holder (47mm) with EN 13284-1 probe
600/SU13284C	Set of spare nozzles (6, 8, 10)

Heated probe with out-stack filtration device

They are made in stainless steel AISI 316 and can be used within a temperature range up to 400°C. This application is mainly required when the temperatures of the emission fumes are particularly high and a large quantity of condensation could affect the whole sampling. The probe consists in two concentric casings housing the sampling tube.

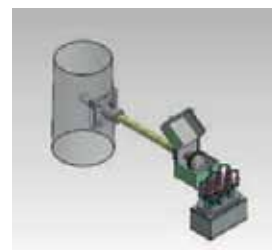
The heating element is placed into the intermediate tube supported by two sealing rings.

In this way, any contact of the sampled gas with thermo-resistors is avoided. Thus, the suction tube can be easily replaced with a new one made of a different material, such as glass, quartz or titanium (on demand). The maximum working temperature is 200°C and is managed by the remote unit ThermoFlow200 (600/TF00200) housed in a watertight case.



The Pitot tube along with the thermo-couple is placed integrally outside the probe, for all detections of the required isokinetic parameters using IsoFlow 202 processor. The integrated heated probe is available in different lengths from a minimum of 750mm to a maximum of 3 meters.

Additionally, all necessary accessories are available for their use with applications such as Dioxins (EN-1948), Heavy Metals (EN-14385), Hydrochloric Acid (EN-1911), Mercury (EN-13211) and Water Content (EN-14790). See the application notes below dedicated to each single sampling method for code specifications. The hot box allows the filter holder containing the sample membrane to be thermostated, assuring constancy of temperature thanks to ThermoFlow control device or directly from AirCube HE-Iso sampler. A double insulated casing allows the operator to be protected against accidental contacts with the probe and the hot box.



How to order

600/SIR0750BB	Heated isokinetic probe with back box, 750mm
600/SIR0750	Standard heated isokinetic probe, no hot box, 750mm
600/SIR1500	Standard heated isokinetic probe, no hot box, 1500mm
600/SIR1500BB	Heated isokinetic probe with back box, 1500mm
600/SIR2000BB	Heated isokinetic probe with back box, 2000mm
600/SIR3000BB	Heated isokinetic probe with back box, 3000mm

Isokinetic ProbesAccessories

600/SF001KDZ	Refrigeration system Stack Frost for Dioxins sampling
600/ART001LT	Insulated containment tank for aluminum impingers with thermometer
600/TF200	ThermoFlow200 Control Device
600/TRSR1500	Spare stainless steel suction tube TPR004
600/TVSR0750	Glass suction tube 1500mm
600/TVSR1500	Glass suction tube 750mm
600/SPFV001SIR	Glass filter holder assembly for back mounting
600/GFR001	Fastening assembly for heated probe
600/TVSR1500ST	Glass nozzles mounting assembly with nozzles and tube 1500 mm
600/TVSR3000ST	Glass nozzles mounting assembly with nozzles and tube 3000 mm
600/TVSR0750ST	Glass nozzles mounting assembly with nozzles and tube 750mm
600/CCTFSIR4	Connection cable for heated probes 4mt
600/CCTFSIR8	Connection cable for heated probes 8mt
600/TPR021	Connection coupling for stainless steel filter holder
600/TPR022	Hose fitting for stainless steel filter holder outlet
600/TPR0750-3TI	Titanium suction tube length 750mm
600/TPR1500-3TI	Titanium suction tube length 1,5mt.
600/TPR2000-3TI	Titanium suction tube length 2mt.
600/TPR3000-3TI	Titanium suction tube length 3mt.
600/TPR5000-3TI	Titanium suction tube length 5mt.
600/SUT610T	Set of Titanium nozzles diameter 6, 7, 8, 10mm (4 pieces) with couplings
600/CSUS00210	Curved Nozzle
600/UC0104/118	Set of 10 Nozzles 4-18
600/SU00468K	Set of stainless steel curved nozzles (4,6,8) with couplings (2)
600/CRS029	Glass Filter Holder 47mm for direct sampling
600/CRS105K	Set of glass filter holders 100mm for EPA 5 method
600/TPR015	Spare small type Pitot tip to be matched to a single nozzle
600/TPR023	Spare long type Pitot tip to be matched to filter holder and cyclone
600/TPR023	Spare medium type Pitot tip to be matched to filter holder

PM10 and PM2,5 fine particulate sampling cyclone according to EPA 201A standard

AMS Analitica has developed two preselectors to be added to isokinetic assemblies for the sampling of fine particle emissions.

Both preselectors have been produced in full compliance with features and sizes given by EPA 201/A method. According to this method sampling can be performed either manually and under isokinetic control. The cyclone fractionation theory provides the separation of the sampled particles based on their aerodynamic diameter, automatically discarding the larger ones through a dedicated path and allowing the smaller particles to deposit on a membrane filter. This is practically the same operating principle as for cyclones and fractionators used in industrial hygiene surveys and in outdoor air quality controls. The PM10 preselector is equipped with Viton seal and is entirely made in stainless steel 316, being so able to withstand temperatures up to 300°C.

The assembly is supplied with carrying case, wrench and a complete range of spare seals. The scope of delivery doesn't include nozzles, which have separate codes. If you already have an AMS Analitica isokinetic kit with interchangeable nozzles, you can safely use it with PM10 preselector. PM2,5: the operating principle of PM2,5 particulate preselector is quite similar to PM10 one, obviously changing the cyclone structure. As for PM10, PM2,5 particulate preselector has been constructed for thorough compliance with EPA 201/A method. Its use is provided for PM10 cascade fractionators, thereby facilitating the separation of the smaller particles and avoiding the interference of the particles with larger aerodynamic diameter. PM2,5 preselector is equipped with Viton seal and is entirely made in stainless steel 316, being so able to withstand temperatures up to 300°C. The assembly is supplied with carrying case, wrench and a complete range of spare seals.



How to order

600/STACK10K	Stack preselector for PM 10 particulate – Nozzles excluded
600/STACK2,5K	Stack preselector for PM 2,5 particulate
600/SU4.18PM10K	Set of nozzles for PM 10 preselector (4-18)
600/ORV0010K	Spare set complete with Viton PM10 seals
600/ORV0025K	Spare set complete with Viton PM2,5 seals

PM10, PM4 e PM2,5 particulate sampling impactor in compliance with EN 23210



Cascade impactors are designed and manufactured for the sampling of PM10, PM4 and PM2,5 particulate stack emissions in compliance with EN-23210 standard, allowing particulate to be sampled directly inside the stack, selecting among the available options (PM10/PM2,5 or PM10/PM4).

These impactors are constructed in anti-corrosion materials and their best use is performed at well-established conditions of temperature, flow, atmospheric pressure and humidity in the stack. Air flow enters the impactor, which is placed perpendicularly or horizontally with respect to the emission flow and is provided with curve and specific nozzles.

Particulate matter is gradually trapped based on particle size on the different impactors, provided with a quartz-fiber membrane. In the last stage, smaller particles are retained on a backup membrane.



How to order

600/PG60.3-2.08-T	PM10/PM2,5 impactor complete with horizontal mounting set and nozzles
600/PG60.3.001K	PM10/PM2,5 impactor complete with vertical mounting set and nozzles
600/PG60.06	Spare impactor plates
600/PG11.03-T	Spare back-up filter supporting plate
600/PG29.04-F-2	Carrying case for impactor plates and accessories
600/PG60.01-F-4	Impactor kit for PM4 with nozzles
FAN/MFQ5019	Quartz filters for impactors EN-23210 with central hole
FAN/MFQ047	47mm diameter Purified quartz fiber filters with no binding (package 25p.)

Flange devices for stack probes support

Flange devices allow the correct positioning of the stack probe. For their proper use, it is mandatory that a mirror flange is properly inserted into the stack; it should have a 90mm inlet and 16 to 22cm distance for mounting brackets.

Flange-type brackets are available for all types of probes produced by AMS Analitica, from the standard one integrated to the heated probe to end with a support for the sampling probe SOV as required by EN-13649 regulation (see dedicated chapter). The support must be purchased separately, only standard probes have this device in their standard equipment.



How to order	
600/GFR001	Fixing assembly for heated probe
600/SF00100	Universal flange integrated probe support
600/GFR002GK	Flange support with probe adaptor Stack2001

Thermoregulator for heated probe TermoFlow200

The thermal control unit TermoFlow 200 is equipped with 2 thermoregulators with proportional control of temperature; they can drive a heated probe and relevant heated filter holder casing. The unit is housed in a shock absorbing ABS case, easy to carry and to set up for sampling. The preparation time for reaching the temperature is about 10 minutes.

The device is equipped with a double alarm system that can be set to selected temperature values. For a proper operation of the thermal control unit, the user must connect the cables, to be ordered separately (600/CCTFSIR4 and 600/CCTFSIR8).



How to order	
600/TF200	Thermal control unit TermoFlow200
600/CCTFSIR4	Connection cable for heated probes 4mt
600/CCTFSIR8	Connection cable for heated probes 8mt



www.amsanalitica.com

Gas sampling stack probe

- Portable heated sampling probe dedicated to VOC in emission monitoring in compliance with EN-13649 requirements.
- Available with a complete part and accessories for the entire EN-13649 sampling protocol

This new system is the logical upgrade of systems based on experience performed with the valid Stack2000Gas, with the addition of some accessories for easier and accurate sampling as well as further probe conditioning autonomy for prolonged sampling times or multiple samplings at the same site.

It consists of a probe sampling device with a spout aimed in the opposite direction of the emission exhaust with a heated pre-filter to retain any particles interfering with the sample (device provided for monitoring of SO_x and NO_x, SOV without eating). The StackGas 2001 probe is configured to allow the user easy sampling. It is available with two standard suction tube lengths: 350 and 750 mm.

The probe is powered by a support housed in a practical shockproof, watertight ABS case including a lead-acid battery (new long-life battery) for the powering of the heater unit even when not connected to a current. A second power support was added to the probe feed. This support is able to sustain a heated suction inlet to be used in case of elevated temperatures present during sampling operations to limit the risk of condensation formation.

The sampling line can be completed with a cooling line with electronic regulation (2100152) as expressly required by the legislative decree. The new StackGas2001 probe can be equipped with a double input device to connect it to a DiluGas[™] dynamic dilution device (optional).

**This set includes:**

- Sampling probe with heated support
- Thermoregulation and powering unit
- 300mm suction tube (option available also in 700mm)
- Case for parts containment and transport
- 14 Ah lead-acid battery
- 50 cm tubing in Tygon 8x10

How to order

600/ISS1400K	StackGas 2001 probe with accessories, case, 350 mm tube
600/ISS350	350 mm suction inlet with sealing nut
600/ISS750	750 mm suction inlet with sealing nut
600/SF60ISSK	Probe support Ø 60 mm
SK/225-1728	Filtration membrane in PTFE Ø 25 mm - 5µm, 50 pkg
NFS/GF1-025-100	Filtration membrane in fibreglass Ø 25 mm, 100 pkg
600/ISSTR12V25K	Heated electro—tubing with pipe fittings Length 2.5 m
600/GFR002GK	Flange support adapter for Stack2001 probe

Peltier Cooling Device System

The new Peltier cell refrigeration device is equipped with a solid, drilled aluminium support able to house a glass set for gas emission exhaust sampling in compliance UNI EN13649 norm. This device can house up to three Type A bubblers and coil condensers to be used for VOC sampling together with 800 or 400 mg activated carbon vials. The extreme versatility of this instrument allows the user dry working for a more constant conservation of desired temperature, as well as the practicality of limiting liquids as with the previous model. The two Peltier cells inserted in the aluminium block allow for quick temperature attainment times and improved conservation constancy of the temperature itself.

This device is composed of an aluminium structure coated with epoxy powder and equipped with a removable upper guard to protect the glass set during transport and during sampling. Also available is a refrigerant housing for the positioning of absorbent vials during sampling with facilitated access by means of a hinge-openable panel, in compliance with norm UNI-EN-13649.

Technical features	
Device structure	Aluminium coated with epoxy powder
Peltier cells	75 W
Maximum absorption	150W (55W in stand-by)
Maximum refrigerator power rendered	75W (45W in stand-by)
Temperature control	Electronic
Precision	+/- 0,5_°C
Unit capacity	Up to three bubbler devices or coil refrigeration
Power	220V/AC
Dimensions without cover	300x240x320 mm (LxPxH)
Dimensions with protective cover	300x240x390 mm (LxPxH)
Weight	7kg

How to order	
600/GR2100IS2	Peltier ICEFLOW 2 Cooling device 600/GR2100IS2
600/TGS001K	Silica Gel Trap with quick coupling
600/GC0004A	Type A Bubbler for SO _x , NO _x , inorganic acids
600/GS001S	Glass coil refrigerant for SOV
SK/226-16	Jumbo 200/400 mg. activated carbon vials for SOV

DiluGas Dynamic Volumetric Diluter

Dynamic diluter for emission gas sampling compliant with the requirements of UNI-EN 13649 part 5.1.2 and made up of:

Technical features	
Suction/pressure pump	With a flow rate of up to 3 litres/minute
Volume control	By dry gas meter
Temperature control	Directly at the meter
Flow control	By a precision rotameter
Gas purification system	With activated carbon trap
Extraction trap device	Facilitated with quick connectors
Epoxide powder	Painted aluminium structure
Power supply	220V-AC/12V-DC (12V optional with PowerPack)
Dimensions	270x270x270 mm
Weight	4.8 kg



How to order	
600/DL13649DGMK	Automatic dilution system with dilution chamber and connectors

The DiluGas dynamic diluter may be used with all portable samplers dedicated to emission gas sampling available on the market, does not require adaptors or particular use devices. Extremely accurate flow regulation is given by a precision manual valve.

The UNI-EN 13649 Regulations indicate three sampling methods for sampling of VOC (Volatile Organic Compounds). The DiluGas dynamic diluter enables the sampling to be performed when the conditions in part 5.1.2. A trap located inside of the system, able to contain activated carbon purifies the air to be sent to the dilution chamber, eliminating cross contamination caused by contaminated ambient air. The DiluGas™ diluter is set up for battery operation as described in the code PowerPack Cube, for complete electrical power independence in the field.

The EU, similarly to the American EPA, developed different techniques for sampling and evaluation of the proper conditions for ducted gaseous streams sampling. The table below shows some of the main applicable laws and regulations in relation to the type of equipment to be employed.

EN-ISO 16911	Manual and automatic determination of velocity and volume flow rate in the ducted gaseous streams	IsoFlow 202-Pro with Pitot "S"
EN 15259	Requirements for measurement sections and sites and for the measurement objective, plan and report	IsoFlow 202-Pro with Pitot "S"
EPA 1	Flow rate and sampling points measurement	IsoFlow 202-Pro with Pitot "S"
EPA 2	Flow rate and volumetric flow measurement through S type pitot probe	IsoFlow 202-Pro with Pitot "S"
EN 14790	Determination of the water vapor with condensation method	Heated Probe with accessories
EPA 4	Determination of the water vapour with condensation method	Heated Probe with accessories
EN 13284-1	Determination of low mass concentration of dust . Manual gravimetric method: 6.2.2 – A: method for filter inserted in ducted gaseous streams	Isokinetic probe combined with filter holder or thimble holder port to be inserted into the ducted gaseous streams
EN 13284-1	Determination of low mass concentration of dust . Manual gravimetric method: 6.2.2 – B: method for filter inserted in ducted gaseous streams	Heated Probe with accessories
EPA 5	Determination of the particulate emitted into the atmosphere from industrial ducted gaseous streams: method for filter external to ducted gaseous streams	Heated Probe with accessories
EPA 17	Determination of the particulate emitted into the atmosphere from industrial ducted gaseous streams: method for filter inserted in ducted gaseous streams	Isokinetic probe combined with filter holder or thimble holder to be inserted into the ducted gaseous streams
EN 13211	Manual method of determination of the concentration of total mercury	Heated Probe with accessories and Mercury kit 13211
EN 14385	Stationary source emissions - Determination of the total emission of As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Tl and V	Heated Probe with accessories and metal elements kit 14385
EN 1911-1	Manual method of determination of HCl. Sampling of gases	Heated Probe with accessories and HCl kit 1911
EN 15713	Manual method of determination of HF. Sampling of gases	Heated Probe with accessories and M400S kit for HF 15713
EN 13649	Determination of the mass concentration of individual gaseous organic compounds - Sorptive sampling method followed by solvent extraction or thermal desorption [2015]	Kit Stack Gas 2001. Extra equipment: dynamic diluter and cooling coil
Istisan 98/2	Detection of the emissions of channeled gaseous flow: SO ₂ , NO ₂ , HC and HF	Kit Stack Gas 2001. Extra equipment: refrigerant and type A bubbler
EN 1948	Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs [2014]	Heated Probe with accessories with PCB and dioxin kit. Titanium accessories available
EPA 23	Determination of the mass concentration of PCDDs/PCDFs	Heated Probe with accessories with PCB and dioxin kit. Titanium accessories available
EPA 26	Sampling of inorganic compounds such HCl, HBr and HF	Heated Probe with accessories and M400S kit for HF
EPA 29	Sampling of emissions of heavy metals like Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Ag, Tl and Zn.	Heated Probe with 600/V6SIR001BBk accessories
EN 23210	Determination of PM ₁₀ /PM _{2.5} mass concentration in flue gas - Measurement at low concentrations by use of impactors.	Cascade impactor compliant with VDI 2066 for PM ₁₀ and PM _{2.5} . Option for PM 4
EPA 201A	Determination of PM ₁₀ /PM 2.5 emissions by use of cyclone device: constant sampling rate procedure	Kit cyclone EPA for dust PM ₁₀ /PM 2.5
ISO 11338-1	Determination of the mass concentration of polycyclic aromatic hydrocarbons (PAHs) in flue gas emissions	Heated Probe with accessories condensation recover and XAD/PUF trap
EN 14791	Determination of mass concentration of sulphur dioxide - Manual method	Heated Probe with accessories
EN 14792	Determination of mass concentration of nitrogen oxides (NO _x) – manual method	Heated Probe with accessories
DIN 50012	Psychrometric method for humidity evaluation	Watercheck AMS system with heated probe

Configuration of ducted gaseous streams sampling systems with unheated probes and stack filter holder

The EN 13284-1 regulation provides in paragraph 6.2.2-A a method for sampling of low mass concentration of dust in ducted gaseous streams by use of filter holder device located within the chimney.

Such method is valid for sampling at low humidity emissions and ambient or mild temperatures. The configuration, conversely to heated sampling configurations, is easier for the accessories and it is also cheaper. On the other hand, this method applies to a more limited number of sampling applications due to its correlation to the conditions of gaseous flow emissions. Please find in the instructions at the end of this catalogue a list of all the conditions that requires the use of a heated probe instead of a standard unheated probe.

AMS Analytica offers a set of three integrated probes that feature in a single support both the sampling pipe connected to the filter holder and the type S pitot pipe. The pitot pipe is supplied with a certificate issued by a third party laboratory, licensed under ISO 17025 (LAT) for measurement and calculation of K factor. These are the options for the unheated probes with the respective accessories (filter holder and nozzles).

Part number	Description
600/SMT0800.1	Integrated 750 mm probe with pitot pipe and temperature probe
600/SMT0015.1	Integrated 1150 mm probe with pitot pipe and temperature probe
600/SMT0020.1	Integrated 2000 mm probe with pitot pipe and temperature probe
600/SMT0030.1	Integrated 3000 mm probe with pitot pipe and temperature probe
600/SF00100	Support for integrated probe with universal flange
600/PF00107	47 mm stainless steel filter holder
600/SU00468K	4, 6, 8 mm fixed curve nozzles set
600/APS00200B	Thimble holder kit with 37 mm stainless steel filter holder
600/CSU001K	4-5-6-7-8-10 mm nozzles set with curve and connection (2016 version)
600/TGS001K	Trap for silica gel with quick connection
600/TS01018	Silicone sampling pipe 10x18
600/VT001T	Thermo container of 4 devices for impingers or moisture trap

Stack sampling systems set-up with heated probes and out stack filter holder

In order to carry out a proper configuration of a sampling sequence for control of ducted gaseous streams parameters, it is important to have some basic parameters at hand. Each method has its line of accessories and share the basic configuration for the dust sampling with heated probe in compliance with EN-13284-1 (6.2.2-B) regulation. In this condition the fundamental parameter to be reckoned is the dimension of the chimney (the diameter for circular chimneys or sides dimensions if rectangular). With this parameter in mind, the proper probe may be chosen as follows:

Part number	Description
600/SIR0750BB	750 mm heated probe with external filter holder and thermoregulation
600/SIR1500BB	1500 mm heated probe with external filter holder and thermoregulation
600/SIR2000BB	2000 mm heated probe with external filter holder and thermoregulation
600/SIR3000BB	3000 mm heated probe with external filter holder and thermoregulation

Once the necessary dimension of the probe is chosen (proportional to the dimension of the chimney) it is important to add some basic accessories which are essential to the dust sampling such as: the support flange of the probe (GFR001K); a temperature controller for the probe, for the filter holder box (TF200), with exception of the HE-Iso model that integrates thermoregulation in the sampler, and for the pertaining connection cables (CCTFSIR4 or CCTFSIR8); the 47mm or 100 mm glass filter holder (EN or EPA methods); the protective silica gel trap (TGS001K); the connection pipe (TS01018) of at least 5 meters; the fixed nozzles set for sampling (4,6,8) or the fixed curve set with interchangeable nozzles.

Part number	Description
600/TF200	Temperature regulator with PID TermoFlow200 control (2 channels)
600/TVSR1500ST	Glass sampling kit with nozzles and 1500 mm pipe
600/TVSR3000ST	Glass sampling kit with nozzles and 3000 mm pipe
600/TVSR2000ST	Glass sampling kit with nozzles and 2000 mm pipe
600/TVSR0750ST	Glass sampling kit with nozzles and 750 mm pipe
600/GFR001	Support flange for heated probe
600/CCTFSIR4	Cable for connections between the temperature regulator and the sampling probe (4mt)
600/CCTFSIR8	Cable for connections between the temperature regulator and the sampling probe (8mt)
600/CRS029	47 mm Glass filter holder with steel ferrule
600/TGS001K	Silica gel trap with quick connection
600/TS01018	Silicone sampling pipe 10x18
600/VT001T	Thermo container of 4 devices for impingers or moisture trap

At this point the sequence is completed and in compliance with the requirements of the EN -13284 regulations for heated probe system (6.2.2-B). The sampler is still to be chosen, however this part will be covered later in this catalogue. Once the sequence is completed, other accessories may be added when needed for ducted gaseous streams sampling of other substances, in addition to dust, each one referred to a specific method. Heavy metals (EN-14385), Mercury (EN-13211), hydrochloric acid (EN-1911), Dioxins, Furans and PCB (EN-1948), Metals EPA-29 and Dioxins EPA-23. Each method provides for a configuration with different sampling accessories matching the heated probe for dusts.

Accessories for Hydrochloric Acid sampling in compliance with EN-1911 regulation

The sampling must be carried out with a standard sampling line as described above, with the addition of the impingers set to trap the hydrochloric acid. A medium-low level flow (max. 2 l/min) in non isokinetic conditions is usually expected. If an isokinetic sampling is needed, a sampler with direct sampling line (isokinetic) must be employed simultaneously with a side stream placed after the filter holder. The side stream features a second sampler separated from the main sampler which is dedicated to the impingers.

Part number	Description
600/V3SIR001BBK	Impingers support for probe rear mounting
600/V3SIR001VS	Full set of impingers and joints for HCl EN-1911
600/TVSR[XXXX]ST	Mounting set of glass nozzles and [XXXX] mm pipe
600/CRS029D	47 mm Glass filter holder for side stream sampling
FAN/MFQ047	47 mm diameter purified quartz fiber filters with no binding agent (package 25 p.)

Please note that the [XXXX] above stands for the length of the glass pipe that depends from the length of the desired probe. The kit includes a pipe, a glass nozzles set and a joints kit necessary to mount the components of the probe. The glass sampling line becomes necessary when the sample to be collected must not get in contact with the metallic parts in order not to risk any corruption or interferences.

Accessories for Heavy Metal sampling in compliance with EN-14385 regulation

The sampling must be carried out with a standard sampling line as described in the section for dusts sampling above, with the addition of the impingers set to trap heavy metals. A medium-low level sampling flow in non isokinetic conditions is usually expected. If an isokinetic sampling is needed, a sampler with direct sampling line (isokinetic) must be employed simultaneously with a side stream placed after the filter holder.

The side stream features a second sampler separated from the main sampler which is dedicated to the impingers.

Part number	Description
600/V3SIR001BBK	Impingers support for probe rear mounting
600/SV14385K	Full set of impingers and joints for metals in compliance with EN-1911
600/TVSR[XXXX]ST	Mounting set of glass nozzles and [XXXX] mm pipe
600/CRS029D	47 mm Glass filter holder for side stream sampling
FAN/MFQ047	47 mm diameter purified quartz fiber filters with no binding agent (package 25p.)

Please note that the [XXXX] above stands for the length of the glass pipe that depends from the length of the desired probe. The glass set is common for all the application of sampling with heated probe.

Accessories for Mercury sampling in compliance with EN-13211 regulation

The sampling must be carried out with a standard sampling line as described in the section for dusts sampling above with the addition of the impingers set to trap the mercury vapors. A medium-low level sampling flow in non isokinetic conditions is usually expected. If an isokinetic sampling is needed, a sampler with direct sampling line (isokinetic) must be employed simultaneously with a side stream placed after the filter holder. The side stream features a second sampler separated from the main sampler which is dedicated to the impingers.

Codice	Descrizione
600/V3SIR001BBK	Impingers support for probe rear mounting
600/V3SIR001VS	Full set of impingers and joints for mercury in compliance with EN-13211
600/TVSR[XXXX]ST	Mounting set of glass nozzles and [XXXX] mm pipe
600/CRS029D	47 mm Glass filter holder for side stream sampling
FAN/MFQ047	47 mm diameter purified quartz fiber filters with no binding agent (package 25p.)

Please note that the [XXXX] above stands for the length of the glass pipe that depends from the length of the desired probe. The glass set is common for all the application of sampling with heated probe.

Accessories for Dioxins, Furans and PCB sampling in compliance with EN-1948 regulation

The sampling of Dioxins, Furans and PCB requires a complex line of sampling made of glass components and accessories for the preparation of the sample at fixed temperature. Similarly to the other applications, the kit necessary to mount the glass accessories (600/TVSR[XXXX]ST), made up of sampling pipe, nozzles and probe mounting support, could be employed. In order to carry out the sampling properly, in particular with respect to ultra-light components, a cooling device for the efficient condensation recovery should be employed, together with a resin XAD-2 or polyurethane foam support. AMS Analitica suggests to use an additional condensate collection device to be placed between the XAD trap and the protective silica gel trap.

Part number	Description
600/DX100101K	Support for cooling device rear mounting
600/DX10011948S	Cooling Set with container, XAD trap and joints
600/SF001KDZ	Cooling system Stack-Frost for dioxins sampling
600/CRS029	47 mm glass filter holder with steel ferrule
SK/P226131C	Purified polyurethane foam for trap
600/CRS050K	37 mm glass thimble holder with steel ferrule
CB/24230	Ultra Clean Resin XAD-2 100g box
FAN/MFQ047	47 mm diameter purified quartz fiber filters with no binding agent (package 25p.)
600/TS01018-5	Silicone pipe 10x18 5mt

At this point, after setting the proper configuration of the sampling line, the model of sampler should be chosen. There are different sampler models that may be used: samplers with manual configuration or automatic isokinetic samplers. The main difference between the two models is that the automatic sampler (COM2-Iso or HE-Iso) manages the sampling stages with the related emissions modifications by automatically aligning the operating conditions in compliance with ISO 9096 and EN16911 regulations. There are two models of automatic isokinetic samplers, i.e. COM2-Iso and HE-Iso. The two models differ for maximum flow (30 or 60 l/min), management of the sampling factors, e.g. measured temperatures, and management of probe heating with the related heater box (HE-Iso).

The COM2-Iso sampler, unlike the bigger model, reaches a minimum flow of 400 ml/min. Another solution, which stands as good compromise between the manual and the automatic samplers, is a line of semi automatic samplers featuring the AirCube COM2-TH sampler and the IsoFlow 202-Pro device for measurement of isokinetic parameters. Both these devices may be used separately and in manual mode and, in addition, may be easily connected, through serial connections, to build an automatic isokinetic system. Below is a list of some combinations of devices, developed for proper ducted gaseous streams sampling, ranging between low cost configurations and fully equipped automatic devices.

MANUAL BASIC OPTION

600/A30001B	Air Cube Basic sampler
600/PP014A3	Power Pack Cube (charger not included)
600/A12VISKPP	Power Pack charger with cable and connector
600/IF202-Pro	IsoFlow 202-Pro device for flow rate measurement
600/SDC001K	IsoFlow 202-Pro software for data download
600/PPC1500BNF-IF	Case for IsoFlow and accessories
600/TS00048	4x8 silicone pipe for IsoFlow 202 Pro 1mt

MANUAL BASIC-EXTRA OPTION

600/A30001Q	Air Cube Basic-Extra sampler
600/PP014A3	Power Pack Cube (charger not included)
600/A12VISKPP	Power Pack charger with cable and connector
600/IF202-Pro	IsoFlow 202-Pro device for flow rate measurement
600/SDC001K	IsoFlow 202-Pro software for data download
600/PPC1500BNF-IF	Case for IsoFlow and accessories
600/TS00048	4x8 silicone pipe for IsoFlow 202 Pro 1mt

These two configurations allow the user to manually set the sampler once detected the intake conditions through IsoFlow 202-Pro device for flow rate measurement. This is a quick and easy to use system. Flow adjustments are fully manual in the Basic sampler and can be controlled through needle valves. The main sampling functions are executed directly on the sampler keyboard in the Basic-Extra version but not in real-time mode.

Com2+IsoFlow 202-Pro option with two modes: manual and automatic*

600/A30002C-TH	Air Cube Com2-TH sampler
600/PP014A3COM2	Power Pack Cube (charger not included)
600/A18VISKPP	Power Pack charger with cable and connector
600/IF202-Pro	IsoFlow 202-Pro device for flow rate measurement
600/SDC001K	IsoFlow 202-Pro software for data download
600/PPC1500BNF-IF	Case for IsoFlow and accessories
600/TS00048	4x8 silicone pipe for IsoFlow 202 1mt

* Manual and Automatic Isokinetic protocol [ISO-9096]

This is the most adaptable solution and allows the user to operate with flexible and at the same time highly accurate devices, capable of satisfying every application requirement. The AirCube Com2- TH sampler is essentially connected, through a serial connection, to the IsoFlow 202-Pro device for flow rate measurement. The logical control of the sampling is managed by the measurement device that modulates the sampling flow at the sampler in accordance with the fluid dynamic conditions at the chimney. The AirCube Com2- TH is versatile also in the dynamic range of its sampling flow, between 400 ml/min and 30 l/min. The same application may be obtained for different intake flows by replacing the Com2-TH model with the HE model. Please check this catalogue for the features of every single sampler manufactured by AMS Analitica.

EN 13649:2015 Determinazione della concentrazione in massa di singoli composti organici di forma gassosa: metodo per assorbimento seguito da estrazione con solventi o con desorbimento termico (2015)

Description	Required Flow Range	Error
Sampling Flow		
Sorbent tubes for chemical desorption	From 0,1 l/min to 0,5 l/min	< 5%
Sorbent tubes for thermal desorption	From 10 ml/min to 100 ml/min	< 5%
Sampling Volume		
Sorbent tubes for chemical desorption	From 10 to 50 liters	< 5%
Sorbent tubes for thermal desorption	From 1 to 5 liters	< 5%
Field blank test		<10% of the emissions limit value
Leakage limit	< 5% of the sampling flow	
Back-up control value of the phial		< 5% of both the sorbent tubes total value for the TD or for the entire coal back up section in the traditional ones
Gas temperature limit	< 40°C	< 2,5°C
Probe heating limit	10°C over the temperature limit value of the chimney, up to a max of 180 °C	

Notes on the operation of absorbent sorbent tubes

Please be advised that sampling flows should be followed precisely at any time thus avoiding the Breakthrough phenomenon. About the sorbent tubes for chemical desorption, keep in mind that the volume and sampling flows values are referred to sorbent tubes containing 100 mg of coal within the main layer and 50 mg in the back-up layer. With respect to sorbent tubes for thermal desorption, section C.1 shows and considers different types of absorbent matrixes for the identification of specific compounds. In addition, the sorbent tubes for thermal desorption, in contrast to the CS2 extracted ones, do not feature a control layer (back-up) and for this reason it will be necessary to use a line of two sorbent tubes, joined together with inert leak-free joints. When sampling SOV emissions, one of the main issues is the presence of humidity in the gas emissions, although over the 80% of productions with SOV emissions in atmosphere work with sufficiently low humidity level. In the event of significant SOV emissions, the applicable law provides, in paragraph A.2 section A.2.1, the application of the dynamic dilution procedure with the emission, in a specific dilution chamber, of a certain amount of purified air or nitrogen, proportionate to the volume of sampled air.

Please keep in mind that the dilution procedure may be used in the event of excessive humidity and SOV emissions at the chimney exit. If both this parameter were to be underestimated, substantial errors of assessment may happen as water is an inhibition source for the absorption of volatile organic compounds on solid layer. Therefore, the excessive concentration of organic compounds leads to a rapid saturation of the absorbent layers and to sample loss during the sampling stages.

AMS Analitica suggests the following absorbent for thermal desorption:

- **Tenax TA**, for Toluene-based compounds or less volatile compounds
- **Carbograph 1TD** for compounds ranging between C5-C6 class up to C14 class
- **Carbograph 5TD** or Carbopack X for compounds ranging between 1,3 Butadiene and Toluene.

Please note that in order to trap a broader range of compounds in just one sweep of multi-layer sorbent tubes for thermal desorption.

EN-13284-1 technical note on membrane filters for ducted gaseous streams sampling

The filters must be compliant to the following minimum requirements:

- 1) the plane filter efficiency should be greater than 99,5% on a test aerosol at the maximum expected flow rate with particles average diameter of 0,3 µm (or 99,9% on a test aerosol with particles average diameter of 0,6 µm). The filter efficiency must be certified by the filter supplier.
- 2) the filter material must not absorb or interact with the gaseous compounds of the gas to be sampled and must be thermally stable with respect to the maximum expected temperature (conditioning, sampling, etc.). The following consideration should be taken in account when choosing the filter:
 - a) the filter back pressure and the pressure build up caused by the dust collection during the sampling depend on the type of filter. For example, pressure may drop up from 3 kPa to 10 kPa for a filtration speed within a range of 0,5 m/s;
 - b) always pay attention to possible weight changes caused by evaporation binding loss during heating when using filters with organic binders. Therefore, it is better not to use filters with organic binders.
 - c) glass fiber filters may interact with acidic compounds like SO₃ that lead to a weight increase; therefore their use is not recommended.
 - d) quartz fiber filters have proven to be efficient in most of the cases despite their poor mechanical properties
 - e) PTFE filters have proven to be efficient although the temperature of the gas passing through the filter must not exceed 230°C.

A relevant note is dedicated to the white part of the filter that has a certain relevance in the event of detection of contaminants at low concentrations.

Part number	Description
600/AW-LMDT04720N	47 mm 2,0 µm PTFE membrane package 100 p.
NFS/GF1-47-100	47 mm GF1 Glass fiber filter package 100 p.
NFS/GF2-47-100	47 mm GF2 Glass fiber filter package 100 p.
FAN/MFQ047	47 mm MFQ grade quartz fiber filter package 25 p.
MKT/420008	47 mm MK360 grade micro fiber filter package 25 p.

EPA 5 and 17 methods

EPA methods have the same requirements of the EN-13284 regulation in particular with respect to the restrictions of SO₂ and SO₃ presence when using glass fiber instead of other materials. The considerations stated for filters retention capacity equal to 99,95% apply also to EPA methods. Unlike European regulation, EPA methods refer to the retention test with respect to Standard Methods: D 2986-71, 78, o 95a.

Tracking certificate for dusts sampling devices at low, medium and high volume.

- In order to achieve accurate results the intake suction flows of every air sampling device requires to be regularly monitored. AMS Analitica, together with MesaLab, offers a series of calibrators for medium and high flow in addition to the popular series of DryCal calibrators, thus expanding the range of applications, from the small and portable personal samplers to the medium and high flow PM10 dusts sampling devices, as requested by the EN-12341 regulation.

Measurement range/flow	Calibrator model	Application
5-500 ml/min	DryCal Defender (510-520)	Low flow calibration. Samplers to be used with absorbent containers or impingers. Graphite piston technology.
50-5000 ml/min	DryCal Defender (510-520)	Medium-low flow calibration. Personal samplers for breathable and inhalable dusts, absorbent container samplers
300-30000 ml/min	DryCal Defender (510-520)	Medium-low flow calibration. Personal samplers for breathable and inhalable dusts, absorbent container samplers. Graphite piston technology.
5-500 ml/min Std. T°C and Pa	DryCal Defender (530)	Low flow calibration. Samplers to be used with absorbent containers or impingers. Graphite piston technology. Detected and normalized flow value referred to Temperature and environment Pressure.
50-5000 ml/min Std. T°C and Pa	DryCal Defender (530)	Low flow calibration. Samplers to be used with absorbent containers or impingers. Graphite piston technology. Detected and normalized flow value referred to Temperature and environment Pressure.
300-30000 ml/min Std.T°C and Pa	DryCal Defender (530)	Medium-low flow calibration. Portable samplers, personal samplers for breathable and inhalable dusts, absorbent container samplers. Graphite piston technology. Detected and normalized flow value referred to Temperature and environment Pressure.
100-30000 ml/min	TetraCal® (TC5 - TC12)	Medium-high flow calibration with excellent accuracy for low flow. Portable samplers, personal samplers for breathable and inhalable dusts, absorbent container samplers. Detected and normalized flow value referred to Temperature and environment Pressure.
1000-60000 ml/min	TetraCal® (TC14 - TC17)	Medium-high flow calibration. PM10 and PM2,5 portable samplers. personal samplers for breathable and inhalable dusts, absorbent container samplers. Detected and normalized flow value referred to Temperature and environment Pressure.



**VISIT OUR WEBSITE
FOR THE LATEST NEWS
OF OUR PRODUCTS**

www.amsanalitica.com

The reference EN 13284-1 provide two different way about stack sampling, depending on emission conditions. The first option provide sampling with a standard probe with inserted perpendicularly into the duct filter holder to the emission flow. This option is recommended for emissions not involving humidity and with low temperature. It allows using non-perpendicular filter holders to sampling flow, reminding to consider also as part of the sampling all the collected parts ahead of the filter.

In-Stack filter holder sampling

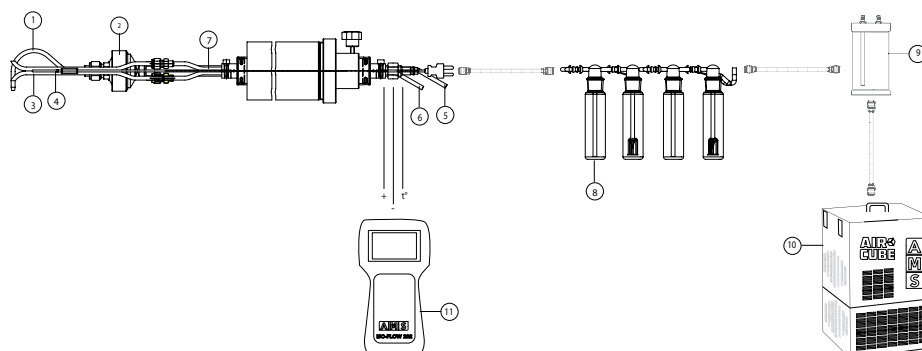
The probe has been designed and produced to follow as strictly as described in the reference EN13284-1 and EPA Method 17. The probe provide a positioning of filter holder into frontal mode to the chimney emission flow trough nozzle positioning. European normative specifies a reference method for calculating low concentrations dusts into gaseous flows channeled into minor concentrations compared to reference conditions 50 mg/.

EPA 17 require a non moisture presence inside the duct. The norm has been validated particularly around 5 mg/ on an average sampling time of half an hour. Generally it can be applied to expelled gas from stationary sources and upper concentrations. If gases contain unstable, reactive or semivolatile substances, calculus depends on sampling conditions and filter treating.

IsoFlow202 Isokinetic Calculator, which had settled with actual parameters described in the normative, may obtain the measurements involving flow rate, differential pressure and temperature. International standards are available as dedicated single software application. All data referred to stack condition can be evaluated, stored in the memory and viewed for easy sampling set-up.

MANUAL METHOD (EN-13284, EPA-17)

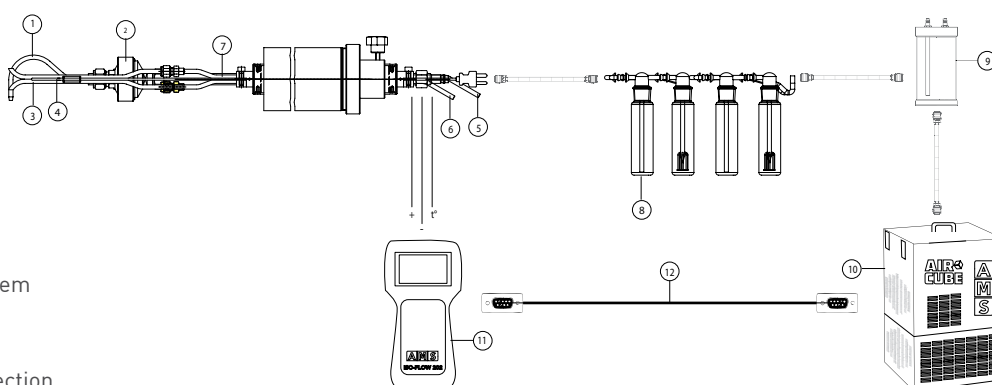
- 1) Entrance inlet
- 2) Filterholder 47 mm
- 3) Pitot Tube
- 4) Temperature sensor
- 5) + Pitot connection
- 6) - Pitot connection
- 7) Support tube
- 8) Silica gel
- 9) Cooling and drying system
- 10) AirCube sampler
- 11) Isoflow measurer



SEMI AUTOMATIC METHOD (EN-13284, EPA-17, ISO 9096)

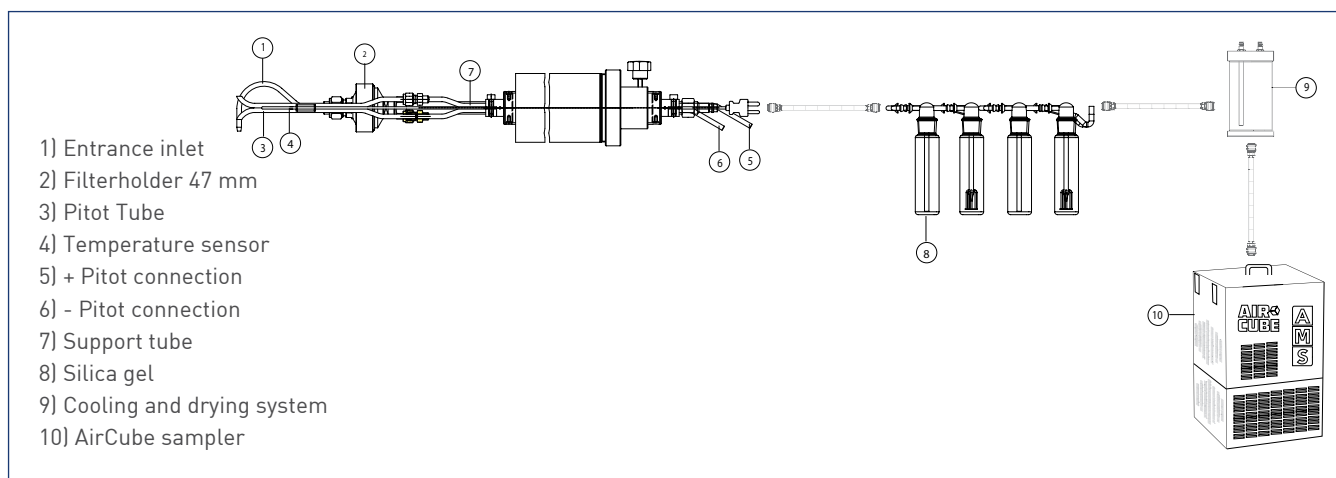
Com2-HE + IsoFlow

- 1) Entrance inlet
- 2) Filterholder 47 mm
- 3) Pitot Tube
- 4) Temperature sensor
- 5) + Pitot connection
- 6) - Pitot connection
- 7) Support tube
- 8) Silica gel
- 9) Cooling and drying system
- 10) AirCube sampler
- 11) Isoflow 202 measurer
- 12) Isoflow/AirCube connection



AUTOMATIC METHOD (EN-13284, EPA-17, ISO 9096)

Com2-ISO + He-ISO



Sampling procedure

A known gas volume extracted by the main gaseous flow in representative points of sampling for a measured period, with a isokinetic checked flow rate and a measured volume. Dusts collected in the gas sample are divided by a pre-weighted plain filter, which later will be dried and weighted once again. Also upstream filter deposits of the sampling system are recollected and weighted. The increasing filter mass and upstream filter collected one, are due to collected dusts from the sampled gas, which consent to calculate dust concentration.

The probe can be provided totally assembled and it concerns Pitot tube and K probe for temperature revelation. All the parts of the probe may be disassembled by the user and be used singularly. It is also available a kit for dust sampling with inserted filter holder inside the chimney dedicated to extremely narrow sections. For the correct positioning or calculus of isokinetic parameters, you have to refer to IsoFlow201/202 flow rate measurer.

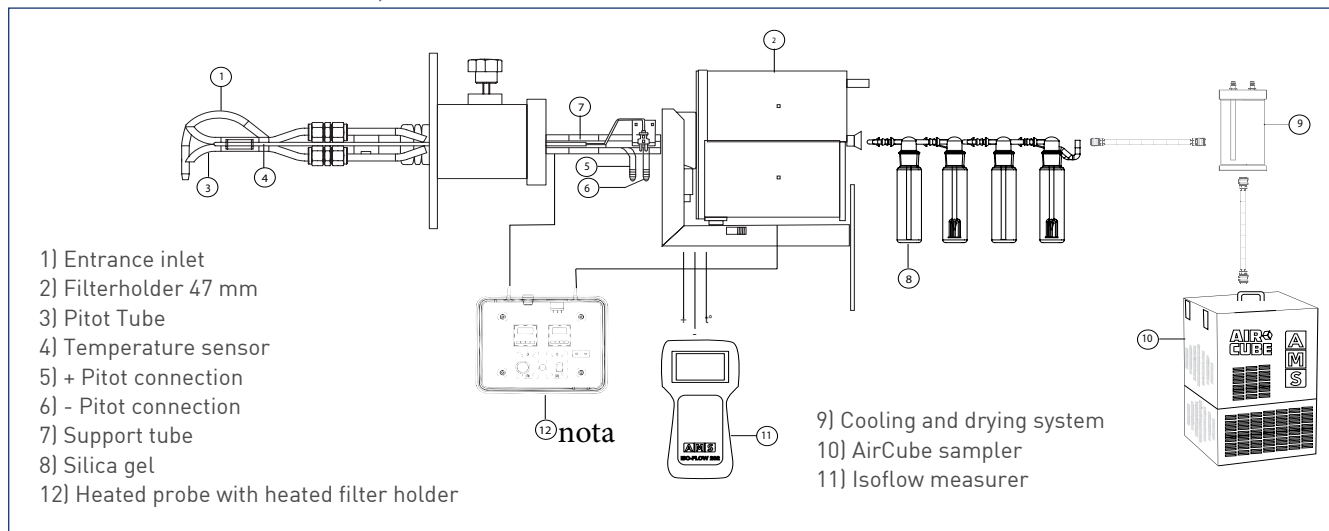
Out-Stack filter holder sampling with heated probe

The second option (EN-13284) 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 normative. Sampling with the manual system will be performed once finished the duct evaluation, with the corrected sizes to have a right test performance. Speed measurements have to be performed using normalized Pitot tubes of kind L, as described into ISO 3966:77. Alternatively, they may be used also Pitot S, whether they have been calibrated like standardized Pitot tubes. Conduct pressure and temperature have to be measured to calculate effective volumetric mass of the gas, considering gas composition. 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 floor.

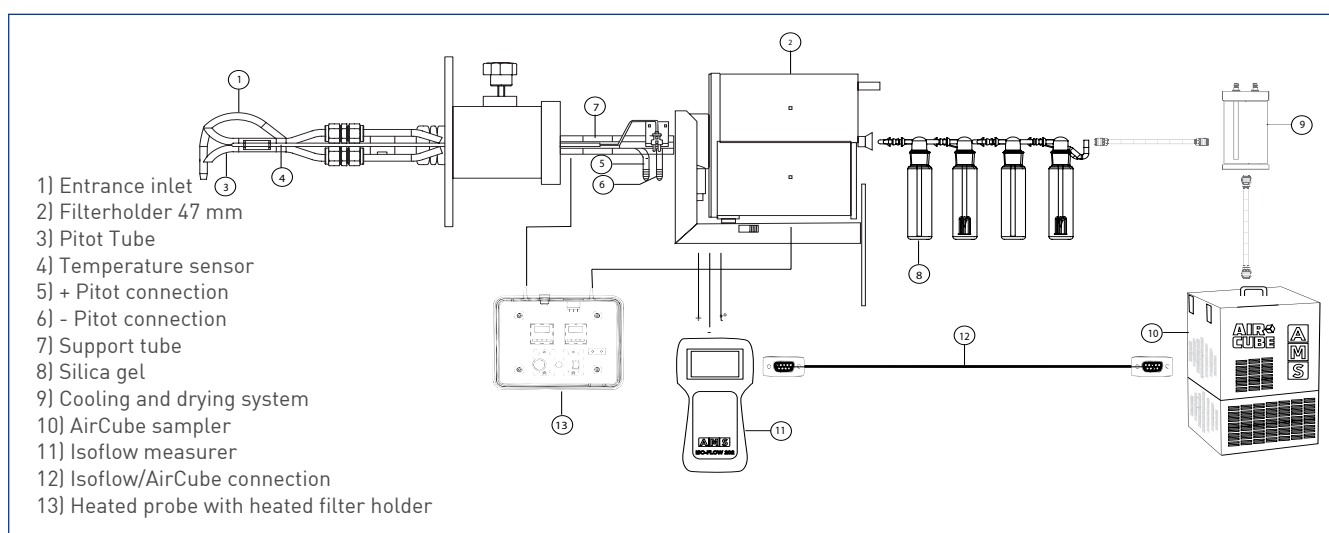
Heated probe with external heated filter holder

The tube part between the nozzle and the filter (suction tube) has to be long enough to allow access in all sampling conduct points. The suction tube and the filter holder have to be controlled temperature, which provokes evaporation of possible water drops or avoid difficult filtering related to acid gases with high dew point. Generally filters with 50mm diameter, with an associated flow rate from 1 m³/h to 10 m³/h. Sampling time for each point is between 30 and 60 minutes. As regarding filtering membranes, it is recommended using membranes 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 usage 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.

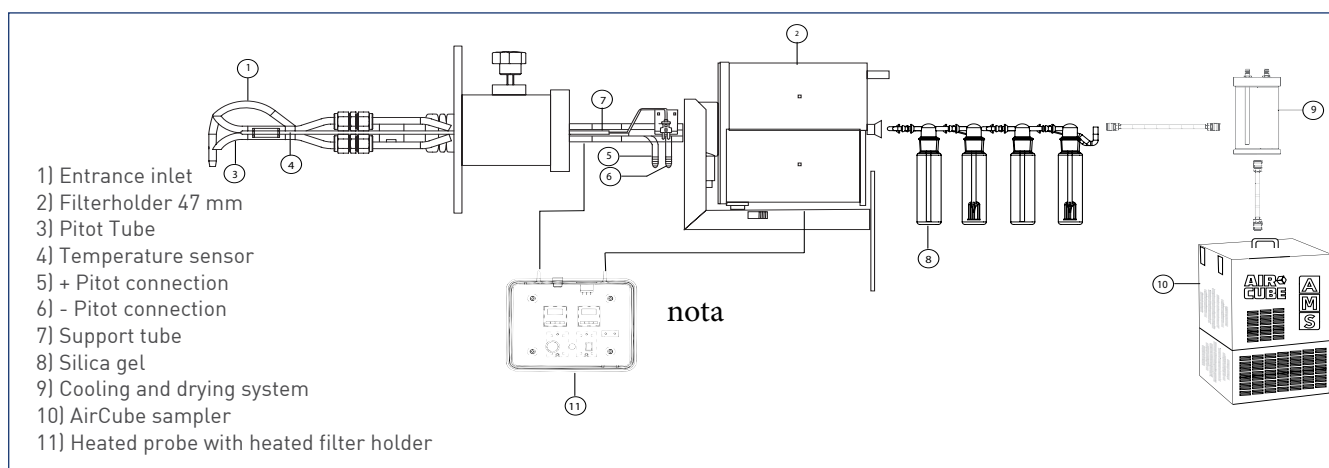
The manual sampling can be performed with every AirCube™ model in the series, combining with IsoFlow 201 Pro isokinetic parameters calculator. The isokinetic automatic sampling is compliant with ISO-9096 and ISO-10780 standards and it will be performed with AirCube™ COM2 ISO and AirCube™ HE ISO models. Alternatively AirCube™ Com 2 and HE samplers may be directly interfaced with IsoFlow 201 Pro measurer.

METODO MANUALE (EN-13284, EPA-5)

SEMI-AUTOMATIC METHOD (EN-13284-1, EPA-5, ISO 9096)

Com2-HE + IsoFlow


AUTOMATIC METHOD (EN-13284-1, EPA-5, ISO 9096)

Com2-ISO / He-ISO



Stack sampling materials list in compliant with EN-13284-1 and EPA Method 17

Filter holder within stack

600/SPR0001K-A2	500 mm length MiniProbe EN 12384 with 37mm filter holder
600/SPR0001K-A1	MiniProbe holder
600/SPR0001K	MiniProbe with stack support
600/SI13284KC	1500mm Isokinetic integrated probe for EN 13284-1
600/PF13284K	37mm filter holder for probe EN 13284-1

In stack filter holder with integrated probes

600/SMT001S	Integrated isokinetic probe 1500mm with pitot tube and T° probe
600/SMT002S	Integrated isokinetic probe 2000mm with pitot tube and T° probe
600/SMT003S	Integrated isokinetic probe 3000mm with pitot tube and T° probe
600/SMT080S	Integrated isokinetic probe 750 mm with pitot tube and T° probe

In stack filter holder with standard probes

600/SI00109	Standard Isokinetic and Pitot S probe 1500mm
600/SI00110	Standard Isokinetic and Pitot S probe 750mm
600/SI00200	Standard Isokinetic and Pitot S probe 2000mm

In Stack Filter Accessories

600/PF00107A	Kit Portamembrana 47mm con ugelli (4,6,8) fissi
600/PF00107B	Kit Portamembrana 47mm con ugelli intercambiabili
600/APS00200	Kit Portafiltro con Ugelli intercambiabili 37mm e porta cestello
600/APS00201	Kit Portafiltro con ugelli fissi (4, 6, 8) 37mm e porta cestello

Out-Stack filter holder with heated probe

600/SIR1500BB	Isokinetic heated probe w Heated box 1500mm
600/SIR0750BB	Standard heated probe w Heated box 750mm
600/SIR2000BB	Isokinetic heated probe w Heated box 2000mm
600/SIR3000BB	Isokinetic heated probe w Heated box 3000mm
600/SIR5000BB	Isokinetic heated probe w Heated box 5000mm
600/TF200	Thermoregulation device TermoFlow200
600/GFR001	Fixing kit for heated probe
600/TVSR1500ST	Mounting nozzles kit in glass w nozzles and tube 1500 mm
600/TVSR2000ST	Mounting nozzles kit in glass w nozzles and tube 2000 mm
600/TVSR3000ST	Mounting nozzles kit in glass w nozzles and tube 3000 mm
600/TVSR0750ST	Mounting nozzles kit in glass w nozzles and tube 750mm
600/CCTFSIR4	Connecting cable for heated probes 4mt
600/CCTFSIR8	Connecting cable for heated probes 8mt
600/TPR0750-3TI	Suction tube in Titanium length 750mm
600/TPR1500-3TI	Suction tube in Titanium length 1,5mt.
600/TPR2000-3TI	Suction tube in Titanium length 2mt.
600/TPR3000-3TI	Suction tube in Titanium length 3mt.
600/TPR5000-3TI	Suction tube in Titanium length 5mt.
600/SUT610T	Nozzles Set in Titanium w diameter 6, 7, 8, 10mm (4 pcs) w junctions
600/CSUS00210	Nozzles curve
600/UC0104/118	10 nozzles set dimension 4-18
600/SU00468K	SS Fixed curve nozzles set Inox (4,6,8) w junctions (2)
600/CRS029	47mm glass filter holder for direct sampling
600/CRS105K	100mm glass filter holder set for EPA 5 method
600/TGS001K	Silica gel trap for quick connection
600/VT001T	Thermal box for condensation collection and glassware

Other Accessories and consumables

600/TS00048	Silicone tube 4x8 for IsoFlow201 and Camp.ISO
600/TS01018	Silicone tube 10x18
FAN/MFQ037	Quartz fiber filters without binder diameter 37mm pkg.25
FAN/MFQ047	Quartz fiber filters without binder diameter 47mm pkg.25
FAN/MFQ102	Quartz fiber filters without binder diameter 102mm pkg.25
NFS/GF1-37-100	Glassfiber filters GF1 (Eq.GFA) 37mm/100
NFS/GF1-47-100	Glassfiber filters GF1 (Eq.GFA) 47mm/100

This method is dedicated to the sampling of discharged heavy metals in emissions coming from hazardous city waste incinerators. The elements analyzed are: Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Magnesium, Nickel, Lead, and Thallium. This method is applicable to each one of these specific elements in the concentration range of 0.005 mg/m³ to 0.5 mg/m³.

The system includes a heated probe with glassware set necessary for sampling heavy metals, without any metal part coming into contact with sampling gas. A special bubbler support is located outside the sensor, immediately after the heated container holding the filter holder. This process avoid forming condense in the sampling line with the loss of the specimen. The norm foresees two different sampling methods, the first one consist of direct gas passage in both supports in the same suction flux, the second one with a derived flow.

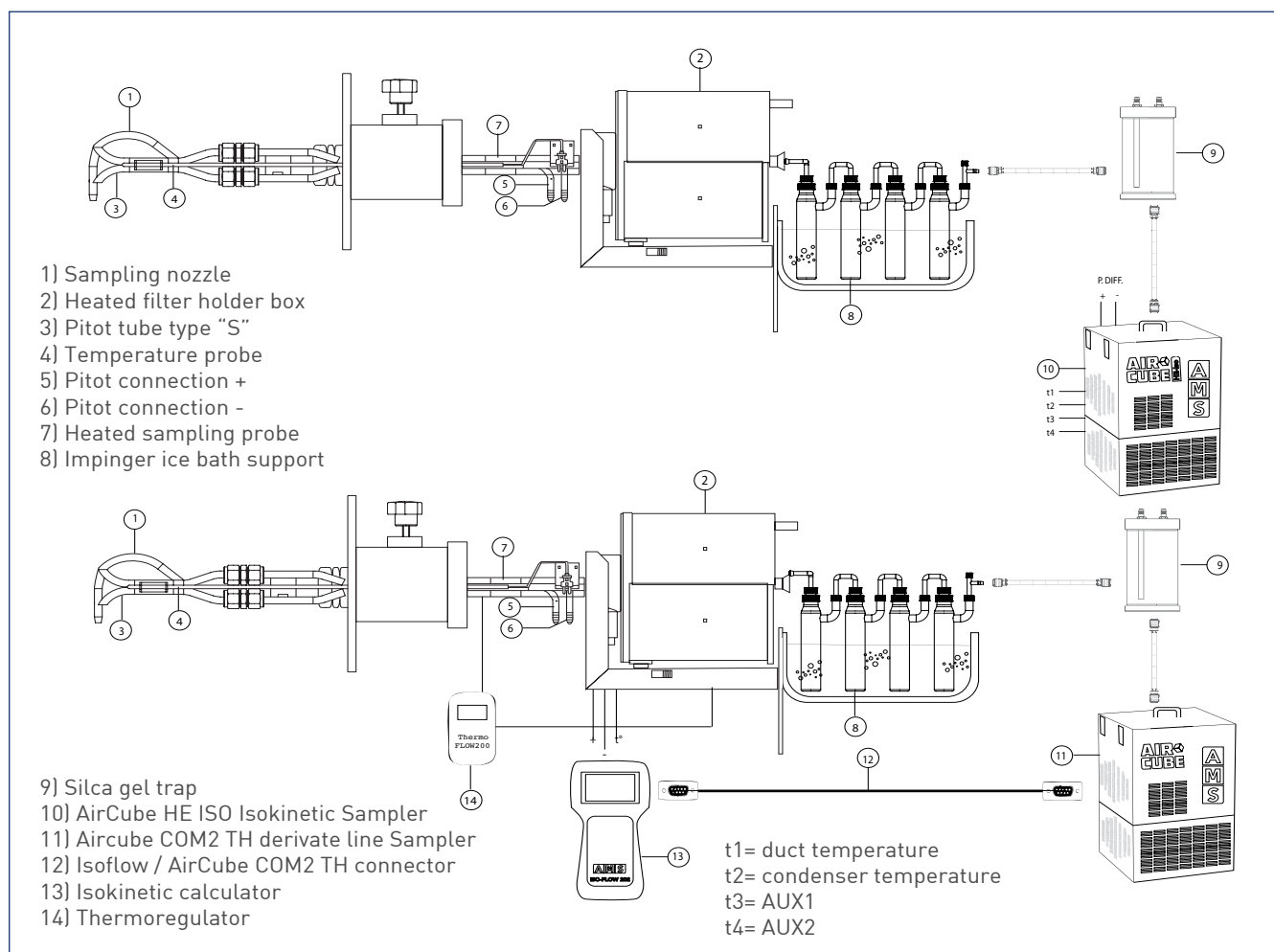
The device may be placed directly to the heated probe complete with heated filter holder box (600/SIR1500BB) through a set of glass unions. Sample is absorbed through three sealed and refrigerated bubblers straight to the tank located in the back of the device; in addition to a fourth empty bubbler.

The volume of a sample extracted will be considered compatibly at the instrumental detectability limits, in order to analytical chosen method. Three kind of filtering membranes may be used: dealing with low concentration sample, membrane must be high quality and free to any binder. Choose is between: fiber glass, quartz fiber or preferably glass fiber covered by PTFE (maximum recommended temperature 300°C).

ISOKINETIC DIRECT SAMPLING

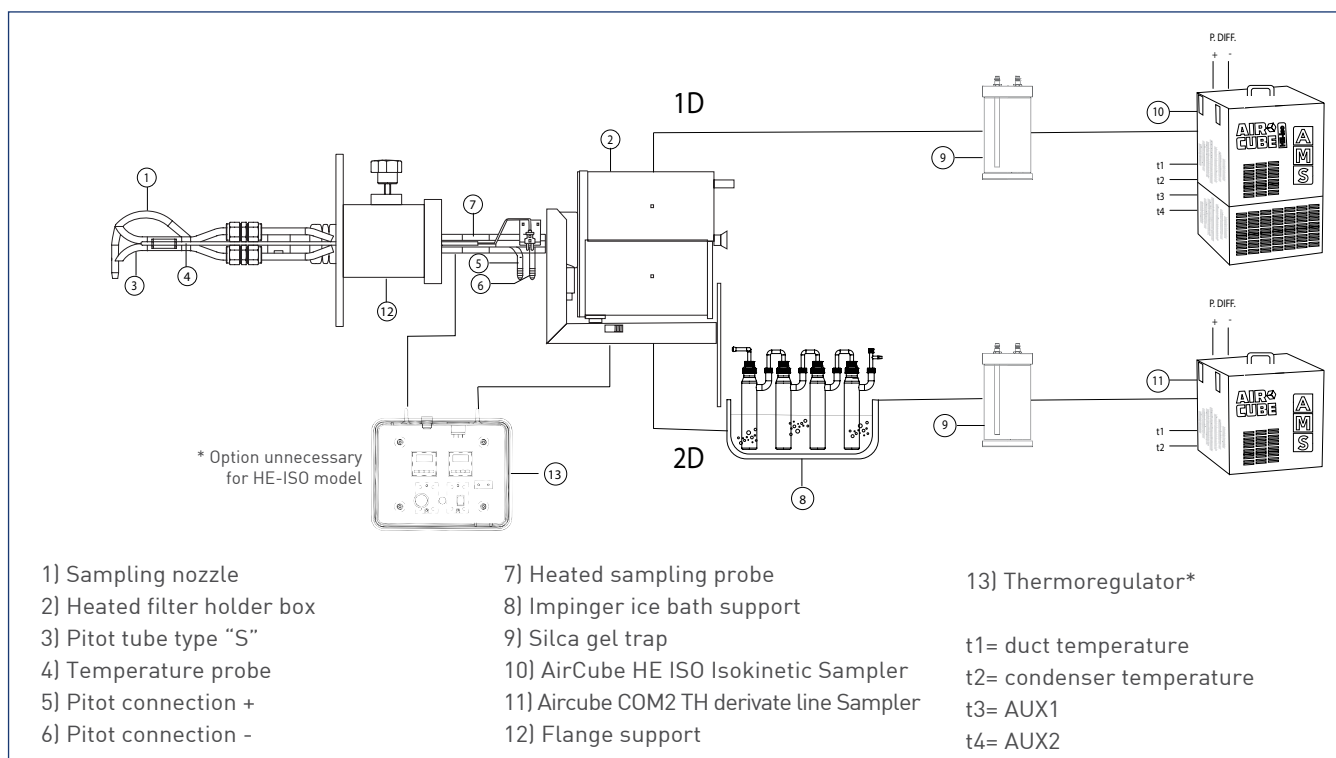
Sampling device has to be designed to reduce gas time to the minimum between sonde nozzle and bubbling absorbers (less than 5s). Sonde temperature must be checked at least at 120°C and also 20°C over the acid dew gas point. The heating device must be designed to reduce to the minimum the non-heated area next to the filter holder union.

Automatic method



DERIVATE SAMPLING

Device does not concern isokinetic sampling mode in real time. The filter holder must have a heated tank (extractor sensor is the same as the isokinetic option) and linked directly to the bubblers attached at the output, three of them with sintered baffle containing a solution adsorption and an empty impinger without baffle. Due to lower gas concentrations and environmental limits, sampling time might be extended.



Materials needed for a correct heavy metal sampling

600/SIR1500BB	Isokinetic heated probe w rear box 1500mm complete w S Pitot tube
600/V3SIR001BBK	Gas bubbler support with rear-mounted probe
600/SV14385K	Complete set of gas bubblers and fittings for Heavy Metals EN 14385
600/TF200	TermoFlow200 Thermoregulation device
600/GFR001	Heated probe attachment group
600/TVSR1500ST	Assembling glass nozzles set w/ pipe and nozzles
600/CCTFSIR4	Connecting cables (4mt) for heated sonde
600/VT001T	Thermal tank w/ bubblers
600/TGS001K	Trap silica gel
600/CRS029	Glass filter holder 47mm for direct sample
600/CRS029D	Glass filter holder 47mm for derived sample

Filter membranes for heavy materials sampling in emission

NFS/GF1-47-100	GF1 grade glass fiber (Eq GFA) pkg 100 pcs
FAN/MFQ047	47mm quartz fiber filter pkg 25 pcs

The system concerns a heated probe including a set of glass tools to sample hydrochloride acid sampling gas getting in touch without affecting any metal part. A special impinger's support device is placed outside the probe, next to the heated box holding the filter holder. This process avoid forming condense in the sampling chain with the loss of the sample.

Normative allows two different kinds of sampling, the first one regards Isokinetic with the derivation of the flow stream for dusts, the other one is only for gas monitor whether there are some particles or not as aerosol form. The device might be placed directly linked to the heated probe with the heated filter holder (600/SIR1500BB) thanks to glass unions. The specimen is absorbed through three impingers seal and refrigerated straight in to the recipient placed behind the probe. The heated probe might be used with a kit of accessories and increasing the number of the impingers positioned in the refrigerated tank, or sampling metals in emission according to method EPA 29, 26° and EN-14385. Hydrochloride Acid sampling might be executed with a double withdrawal system, one for gas part with standard process and three bubblers, the other one for dust and allow gas in isokineticism in real time.

ISOKINETIC SAMPLING

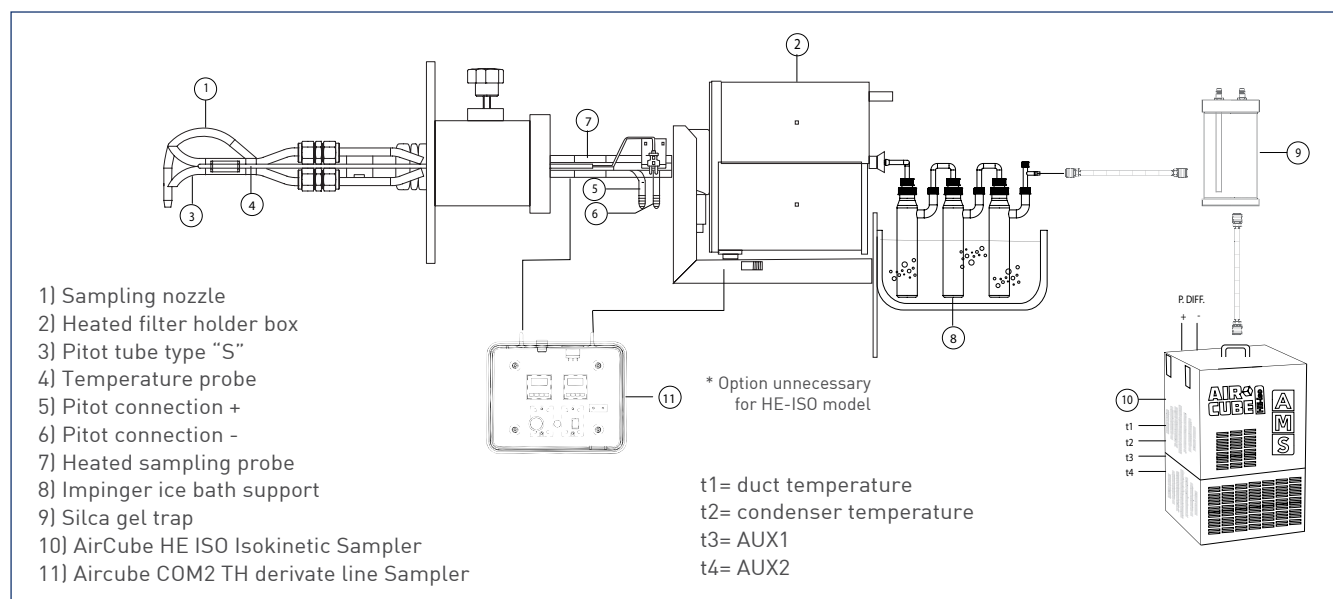
Sampling device has to be designed to reduce gas time to the minimum between probe nozzle and bubbling absorbers (less than 5s). The heated probe and inlet nozzle must be manufactured in according with norm ISO 9096:1992. The requirements of the inlet nozzle edge might be less binding because these parts are often made of borosilicate glass not very workable to rigid tolerances. Probe temperature must be checked at least at 120°C and also 20°C over the acid dew gas point. The heating device must be designed to reduce to the minimum the non-heated area next to the filter holder union. Membrane holder must containing a filtering material with efficiency over 99,5% for the volume maximum effective flow the filter to avoid measurement error due to saline chloride particles that might be analyzed as hydrochloride acid (HCL).

The most appropriate filters are flat, made of glass fiber or different diameters of quartz. The filter holder must be heated to maintain steady gas temperature. The derivation for the line of impingers for collection hydrochloride acid is placed downstream of the outlet the filter holder and its aspiration flow has to be between 2 and 3 liters per minute. The main line will be definite with isokinetic criteria; will have a flow rate between 30 e 150 liters per minute (according to the aspirating pump tools).

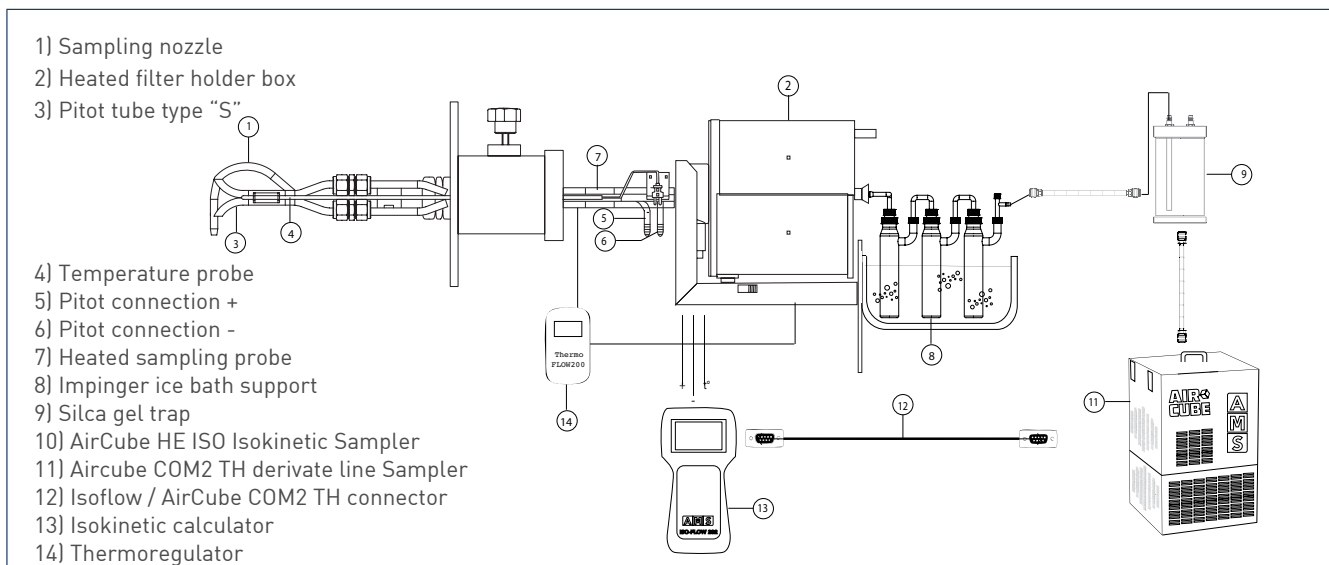
NOT ISOKINETIC SAMPLING

Device does not concern isokinetic sampling mode in real time. The filter holder must have a heated tank (withdrawal feeler is the same as the isokinetic option) and linked directly to the bubblers attached at the output, two of them with sintered septum containing a solution adsorption and an empty impinger without septum. Sampling time is directly proportioned to gas and foreseen limits concentration. On average a sampling has a concentration range in between 1mg/m³ and 10mg/m³ and requires a volume between 50 and 200 air liters, with a sampling time not less than 30 minutes. Due to lower gas concentrations, sampling time might be extended.

Automatic method



Semi-automatic method



Materials needed for a correct HCL sampling

600/SIR1500BB	Isokinetic heated sonde with box 1500mm w/ Piton S pipe
600/V3SIR001BBK	Bubblers support w/ back assembling sonde
600/V3SIR001VS	Bubblers set and unions for HCL EN-1911
600/TF200	Thermoregulation device ThermoFlow200
600/GFR001	Fixing group for heated sonde
600/TVSR1500ST	Assembling glass nozzles set w/ pipe and nozzles
600/CCTFSIR4	Linking cables (4mt) for heated sonde
600/VT001T	Thermal tank w/ bubblers
600/TGS001K	Trap silica gel
600/CRS029	Glass filter holder 47mm for direct sample
600/CRS029D	Glass filter holder 47mm for derived sample

Accessories and replacement parts

600/V6SIR009-1	Bubbler impinger (glass part)
600/V6SIR010-1	Internal dip tube for impinger septum 30mm Att. GL32
600/V6SIR011-1	Internal dip tube for impinger straight pipe Att.GL 32
600/V6SIR013-1	Rotulex junction 18/9 90° curve
600/V6SIR014-1	GL14 junction d.13 glass part
600/V6SIR012-1	d.13 junction 90° double curve
600/V6SIR015	Perforated plug GL-45
600/V6SIR016	Orifice gasket 26 Sil/ptfe for GL45
600/V6SIR017	Perforated plug GL-32
600/V6SIR018	Orifice gasket 12 Sil/ptfe for GL32
600/V6SIR019	Perforated plug GL-25
600/V6SIR020	Orifice gasket
600/V6SIR021	Perforated plug GL-14
600/V6SIR022	Closed gasket Sil/ptfe for GL-14
600/V6SIR023	Closed plug GL 14

The method involves measuring the concentration of water vapor through sampling with isokinetic probe . Are taken into account both methods with filter holder inside and outside the duct . In both cases, one must use a probe heated to about 120 ° C , still 20 ° C higher than the value of the dew point of the gas.

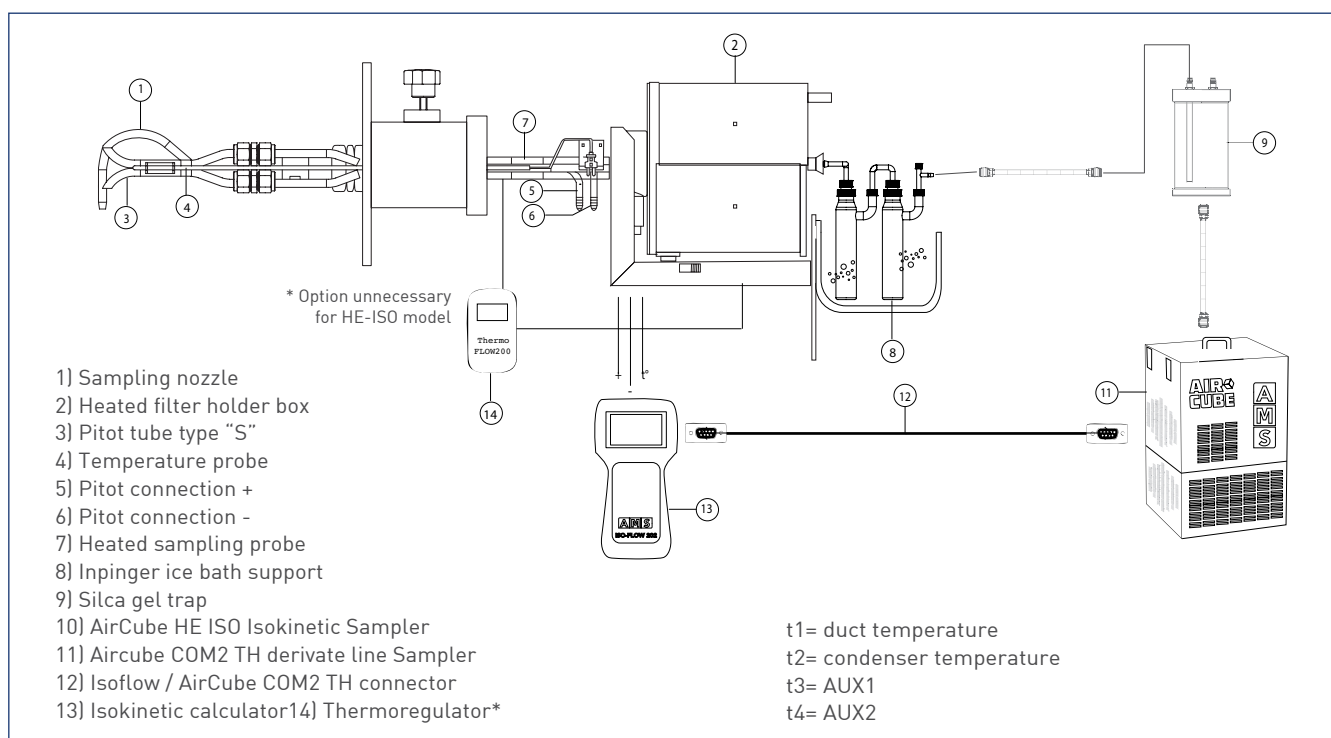
A known volume of sample E extracted from a duct for a predetermined time at a specific flow of sampling. The filter holder located on line sampling has the purpose of retaining the particles of dust That could interfere with the measurement.

There will exit due possibility of adsorption:

- 1) An adsorption unit containing silica gel
- 2) An adsorption unit condensing MADE due to bubblers-capacitors and A Unit adsorbent containing silica gel

The use of single adsorbent trap consists of Get In A bottle or better one vessel with quick On Line Sampling filled with silica gel granules with a colorimetric indicator. The adsorption unit condensing consists of a line of cause bubblers placed in a bath Near to the output flow from the sampling probe.

The tank will be filled with dry ice to facilitate the condensing of the steam. AFTER Two bubblers can be positioned An adsorption unit similarity That of a previous position always containing granular silica gel with indicator. The minimum sampling time and Di 30 Minutes For a volume of about 50 liters of Champion. In case the content of water vapor SIA particularly low sampling time can be extended to the volume of the United Nations greater Champion. In Case Sampling Terms of gas saturated steam, with presence of water droplets, Refer to Tables for the adjustment of the value of concentration present in the Statement.



Materials needed for a correct water vapor sampling

600/SIR1500BB	Isokinetic probe heated box post . 1500mm
600/SIR0750BB	Isokinetic probe heated rear box 750mm
600/V3SIR001BBK	Support bubblers with rear mounting probe
600/TF200	Device thermoregulation ThermoFlow200
600/GFR001	Group fixing probe heated
600/CCTFSIR4	Connection cable for heated probes 4mt
600/CRS029	Glass 47mm filter holder for direct sampling
600/SV14790K	September glassware for sampling Water Vapor

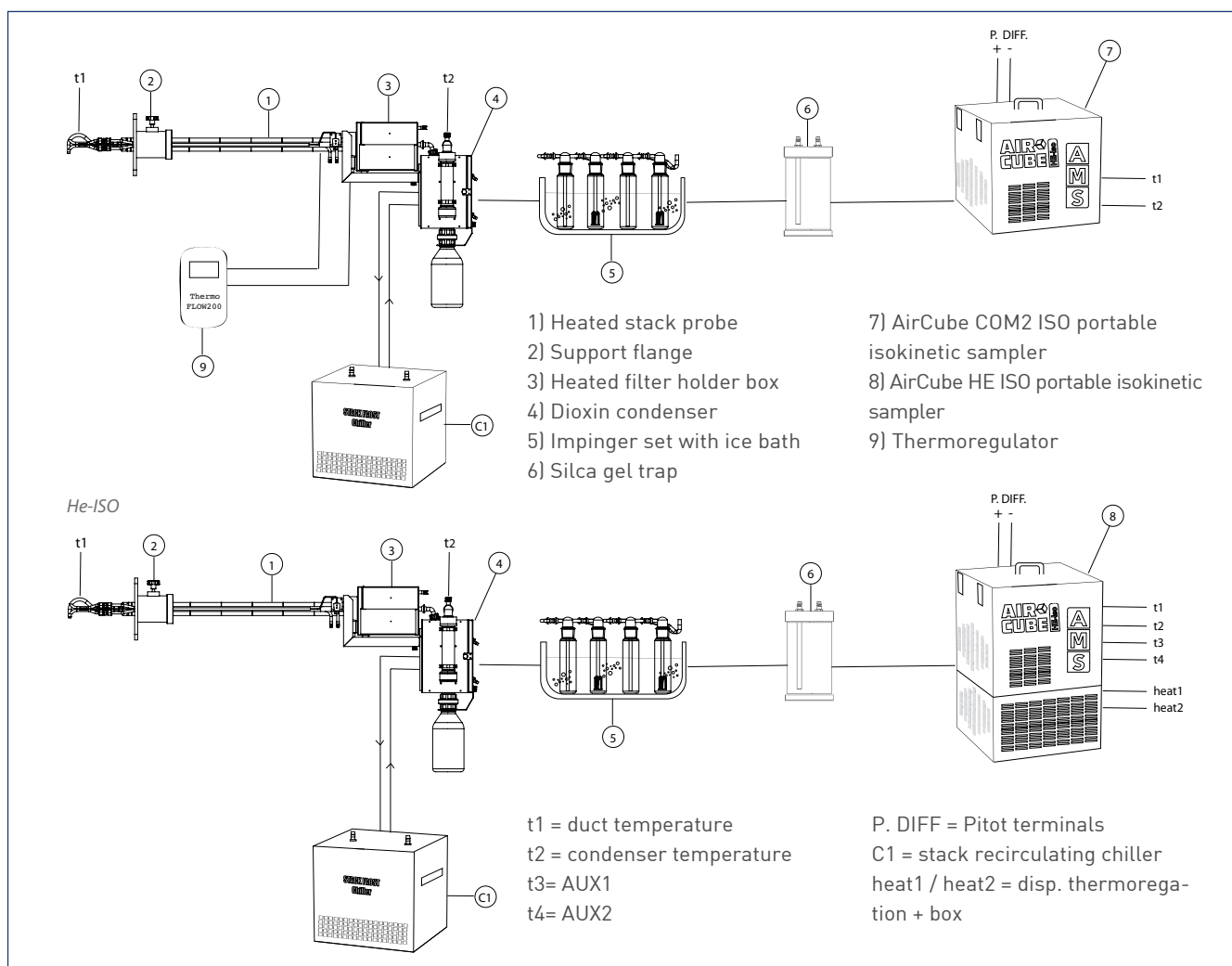
UNI-EN 1948:2006

This sentence refers to the last variation of the version dated 1999 because it has been changed some phases in the technical-analytical process and there are new normative references about oxygen sampling (EN-14789) and humidity content (EN-14790).

The gas is sampled isokinetically in the emission conduit. The PCDD/PCDF is absorbed by the particulate and present gaseous, recollected in the sampling line. The system gathering components may be a filter, a device for the recovery of the condensate and an absorbing material liquid or solid compatible with the chosen sampling system.

The regulations allow choosing between three different sampling systems: Filter/condenser method - Dilution method - Cooled probe method. The first method is the most used one, contemplating the insert of a support for XAD-2 amberlyst resin or similar or purified polyurethane foam (PUF-Skc P226-131).

FILTER CONDENSED METHOD



The system foresees that the filter is placed downstream of the nozzle after the heated sensor (outside of the conduit) in a specific heated tank. The filter has to be maintained less than 125°C, over the gas dew point in the chimney. When it is foreseen a major load of dust it might be incorporated a quartz wool filter or a cyclone device in the sampling line before the filter, to avoid an overload of the same filter. Downstream, a condenser is connected to cool the sampled gas underneath 20°C. The device may be also used with a higher temperature only if the results obtained in the event have been demonstrated that are the same. Gaseous part of PCDD/PCDF aerosols are held back by the absorb solid. In a variant of the sampling system the solid absorbing element may be placed between the condenser and the gathering condensate device. The flux repartition system differs after filtration there is a flow distributor (similar to those used for other methods of emission sampling). The main high volume flow as to be compliant with the Isokinetic conditions (ISO-9096) crosses the filter.

The secondary current after the repartition of the flux corresponds to the device with the condensation and absorbent unit previously described. The sampling must be performed according to the dictates and positioning indicated into the EN-13284 regulations.

Sampling time is anticipated in a range included between 6 and 8 hours, even if in the regulations refer to an average estimated sampling time 6h. The sampling system has been validated for high voltage flow between 0,5 m³/h and 0,7 m³/h (secondary current) and between 3 m³/h and 5 m³/h (main current). For the device with resin XAD-2 previously purified a quantity of circa 30g has been indicated. Regulate by-passed flow to maintain the ratio between the derived flow and the main flow ($\pm 10\%$); making sure that the speed in the XAD-2 cartridge is not greater than 34 cm/s.

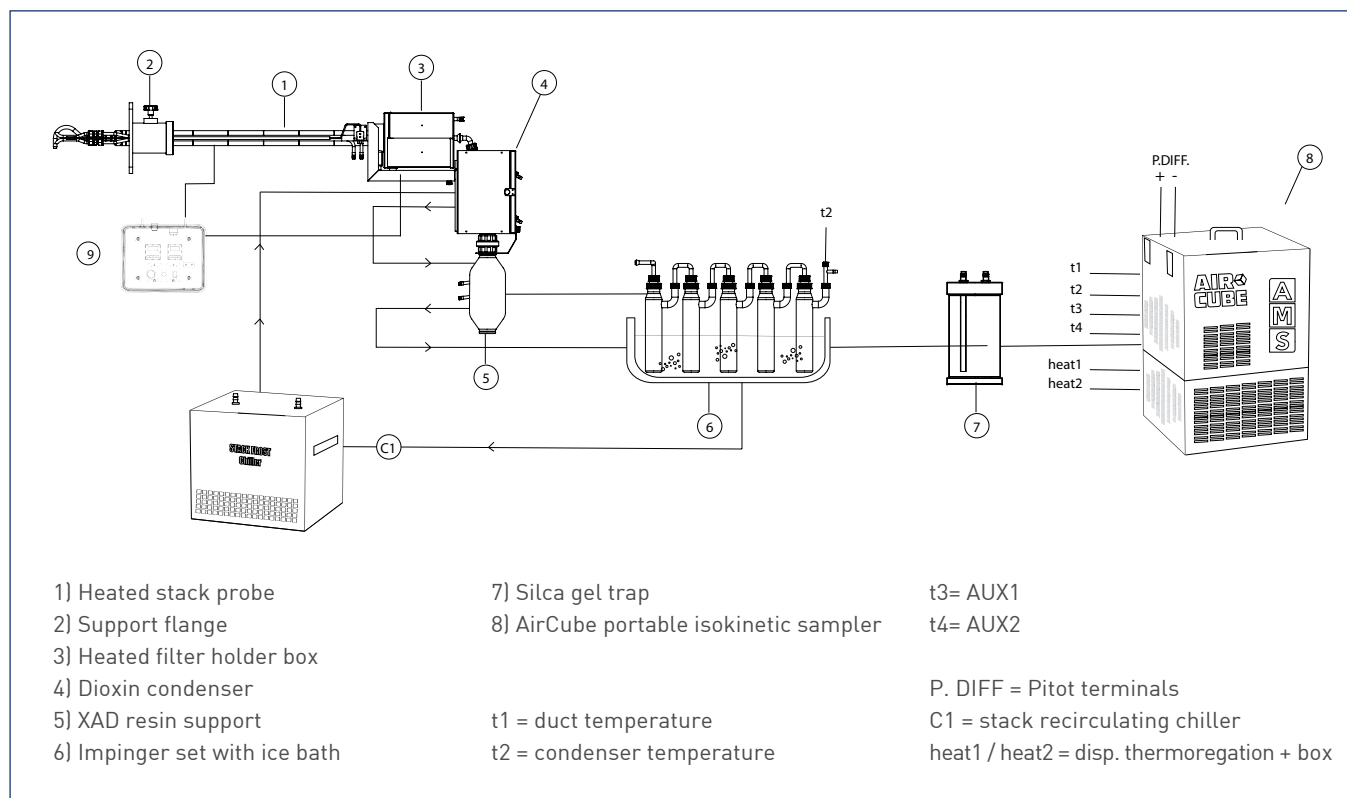
Marking of the filtration device: mark the filter dividing into portions from 5 to 30 μ l of solution of sampling reference on different points of the filter. Keep the filter vertical for a short period until the solvent is evaporated. The filter can be used for sampling only 2 hours after the reference marks have been applied. The marked filter may be stored for several days. In addition to that, also the absorbing material XAD-2 can be marked, or it might be marked in alternative to the filter. If during sampling need to replace the marked filter, the new one must be marked as the same time. This last option must be considered into final phases of the calculus.

FILTER/CONDENSER METHOD

Option with solid absorbent upstream of the condensate collector

The gas from the duct enters into the sampling line through a heated probe containing a core and some parts in contacts with the glass sample. The filter holder is contained into an electrically heated box located downstream the probe. This is followed by a water-cooled serpentine condenser and a cartridge also cooled with water and filled with XAD-2 resin. The condensate and the gas pass through resin and in a bottle flask in which condensate is recollected. The gas temperature in the sensor and in the filter is regulated between the dew point of the gas in the conduit and 120°C. In the probe there is a thermocouple type to check the gas temperature in the duct and a Pitot tube type, to measure the flow voltage in the duct. After the condensate collector the gas is aspirated by a pump through a drying line filled with silica gel, a gas meter and a flat orifice flow-measuring device. Sampling system is made on the base of a volume flow from circa 5 liters per minute to 25 liters per minute. All the elements included into sampling line not in contact with the sample are linked with rubber flexible tubes.

EPA 23 - DIOXINE STACK SAMPLING LINE



**Materials needed for a correct dioxin sampling in compliant EN-1948:2006.
Filter/Condensed/Resin XAD-2 method**

600/SIR1500BB	Isokinetic heated probe with rear box 1500mm
600/DX100101K	Cooling device support with rear mount
600/DX10011948S	Refrigerant set with XAD bottle, trap and fittings
600/SF001KDZ	Stack Frost Refrigerant System for Dioxin sampling
600/CRS050K	37 mm glass thimble holder complete with metal ring nut
600/TF200	TermoFlow 200 thermoregulation device
600/SUV6/8	Glass nozzle set 6-8-10mm (1+1+1)
600/GFR001	Heated probe attachment group
600/TVSR1500ST	Nozzle attachment set in glass complete w nozzle and linking
600/CCTFSIR4	Heated probe connection cable 4mt
600/CCTFSIR8	Heated probe connection cable 8mt
600/CRS029	47 mm glass filter holder for direct sampling
600/CRS029D	47 mm glass filter holder for derived sampling
600/TGS001K	Silica gel trap w quick inlets
600/VT001T	Thermal container for condensate gather

**Materials needed for a correct dioxin sampling in compliant EN-1948-1:2006 and EPA 23.
Solid resin absorber downstream gathering condenser XAD-2**

600/SIR1500BB	Isokinetic heated probe w rear box 1500mm
600/DX100101K	Cooling device support w back mount
600/DX0005G	XAD-2 GL45/25 trap w 35 baffle and cladding
600/SF001KDZ	Stack Frost refrigerant system for dioxin sampling
600/SF002MSL	Refrigerated tank combined w StackFrost device
600/CRS050K	37mm glass thimble holder complete w metal ring nut
600/TF200	TermoFlow200 Thermoregulation device
600/SUV6/8	Glass nozzle set 6-8-10mm (1+1+1)
600/GFR001	Heated Probe attachment group
600/TVSR1500ST	Glass nozzle attachment set complete w nozzles and linking
600/CCTFSIR4	Heated probe connection cable 4mt
600/CCTFSIR8	Heated probe connection cable 8mt
600/CRS029	47 mm glass filter holder for direct sampling
600/CRS029D	47 mm glass filter holder for derived sampling
600/TGS001K	Silica gel trap w quick inlets
600/SGDX23001K	5 gas bubblers set and fittings for method 1948 and EPA 23

Refill materials for dioxin salmpling in compliant with EN-1948

NFS/GF1-47-100	47mm GF1 grade glass fiber (Eq GFA) pkg 100
SK/225-1823	Tissuquartz™ quartz fiber filter thick.432μ 47mm pkg 25
PL/TBD7212	Glass fiber filter membrane clad in PTFE max 300°C 47mm pkg 50
600/CN086R25	Thimbles in borosilicate 30x80 pkg 25
600/CN088R25	Thimbles in pure silica HT max 1000°C 30x80 pkg 25
600/HI39P503F2	Quartz wool for baskets 500g
SK/P226201	XAD-2 SKC resin for PCDD/PCDF 100 g EN-1948-1
SK/P226131	SKC non-purified polyurethane foam pkg 10
SK/P226131C	SKC pre-conditioned polyurethane foam pkg 10

*This method is focused on discharged mercury in emission coming from hazardous city waste incinerators.
The method is applicable in the concentration range of 0.001 mg/m³ to 0.5 mg/m³.*

The system includes a heated probe with glassware set necessary for sampling heavy metals, without any metal part coming into contact with sampling gas. A special impinger support is located outside the probe, immediately after the heated box holding the filter holder. This process avoid forming condense in the sampling line with the loss of the sample.

The norm allow two different sampling methods, the first one consist of direct gas passage in both supports into the same suction flux, the second one with a derived flux. Even if the mercury is prevalently present in gaseous form, it may also been found in dust or in drops inside blast chilling. Anyway Isokinetic sampling is necessary to accurately collect dust and drops. When the Isokinetic sampling is over, dust, drops and aerosol form must be sampled by the same device. This process is required because of the parting into gaseous/solid/liquid form of the mercury.

The device may be placed directly to the heated probe completed with heated filter holder box (600/SIR1500BB) through a set of glass unions. Sample is absorbed through two sealed and refrigerated bubblers straight to the tank located in the back of the device; in addition to a third empty bubbler.

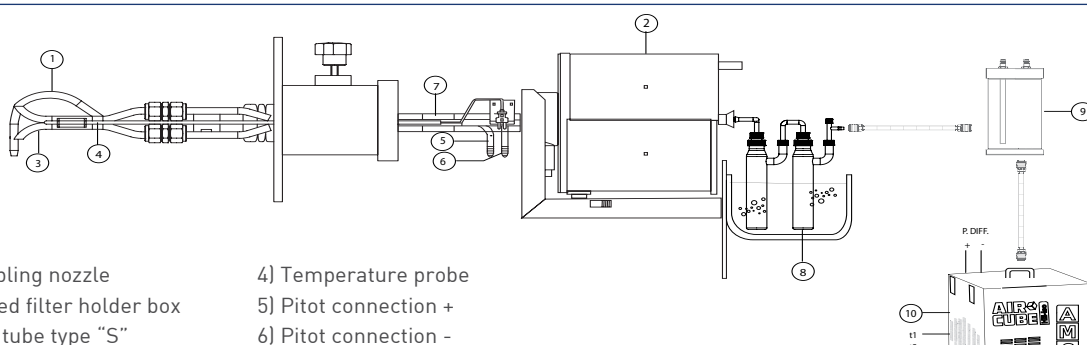
The volume of a sample extracted will be considered compatibly at the instrumental detectability limits, in order with the analytical chosen method.

Three kind of filtering membranes may be used: dealing with low concentration sample, membrane must be high quality and free to any binder. The choose is between: fiber glass, quartz fiber or preferably glass fiber covered by PTFE (maximum recommended temperature 300°C).

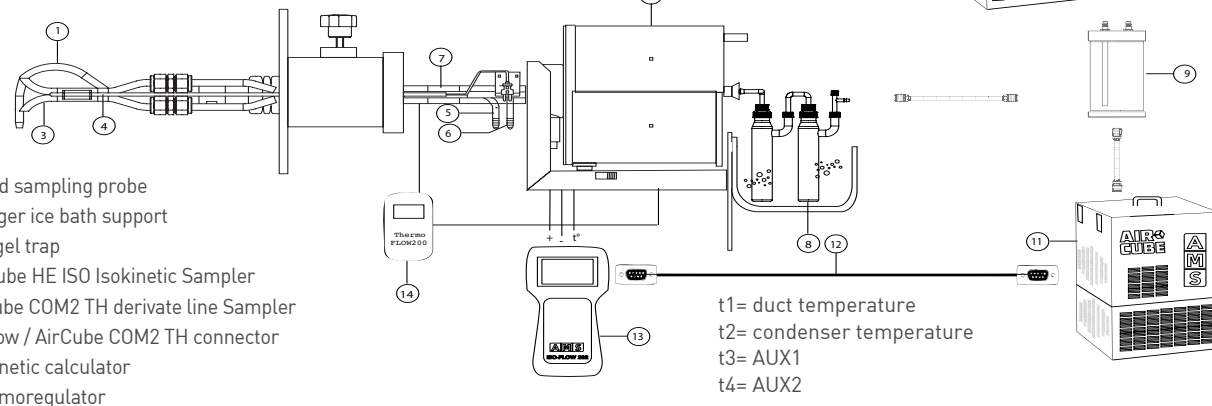
ISOKINETIC DIRECT SAMPLING

Sampling device has to be designed to reduce gas time to the minimum between sonde nozzle and bubbling absorbers (less than 5s). Sonde temperature must be checked at least at 120°C and also 20°C over the acid dew gas point. The heating device must be designed to reduce to the minimum the non-heated area next to the filter holder union. The direct line foresees a Isokinetic sampling directly linked to the filter holder.

Automatic method



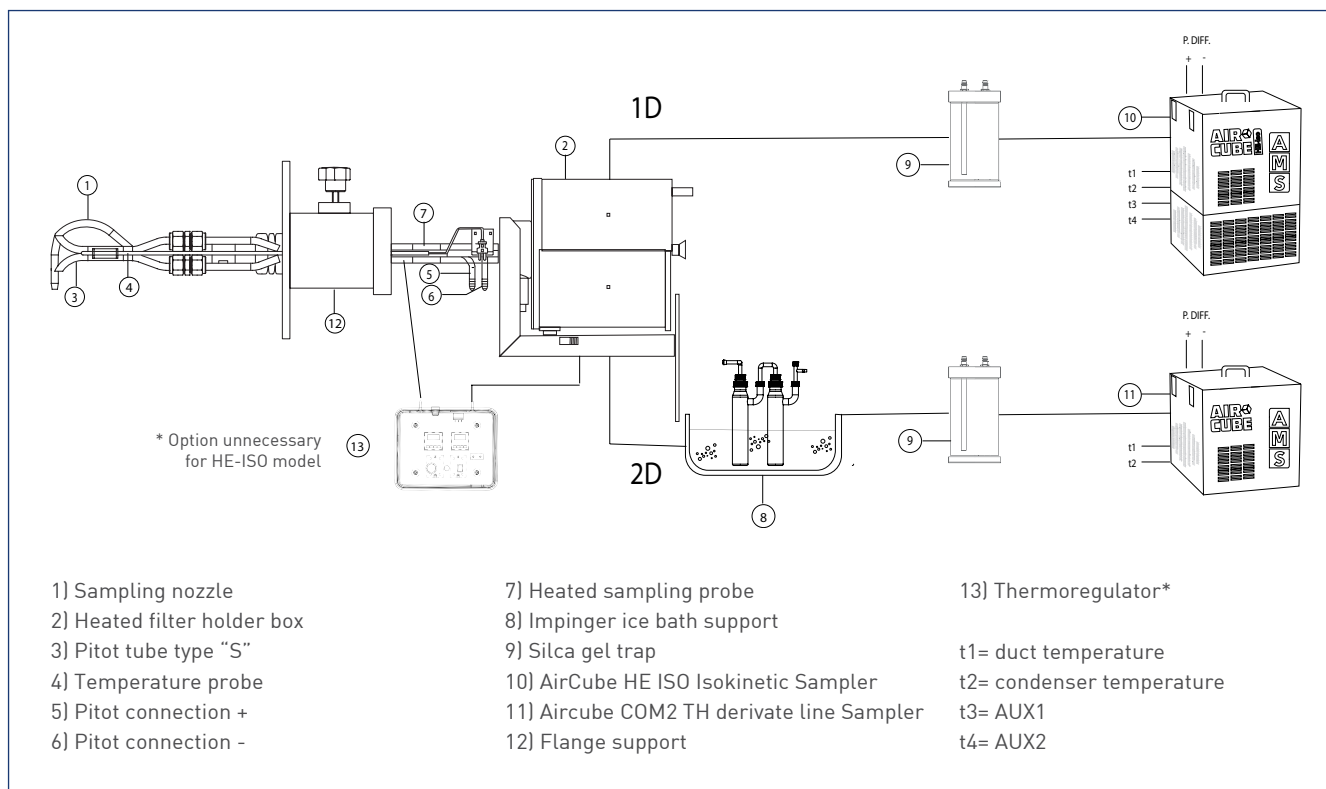
Semi-automatic method



DERIVATE SAMPLING

Device does not concern isokinetic sampling mode in real time. The filter holder must have a heated box (withdrawal feeler is the same as the isokinetic option) and linked directly to the bubblers attached at the output, three of them with sintered septum containing a solution adsorption and an empty impinger without septum. Due to lower gas concentrations and environmental limits, sampling time might be extended.

In this method it's not recommended direct sampling with all adsorbing elements (filter and impinger) because of the high flux and high volume of solution adsorption needed.



Materials needed for a correct mercury sampling

600/SIR1500BB	Isokinetic Heated Probe w rear box 1500mm complete w S Pitot tube
600/V3SIR001BBK	Gas bubbler support with rear-mounted probe
600/SV13211K	Complete set of gas bubblers and fittings for Heavy Metals EN 14385
600/TF200	TermoFlow200 Thermoregulation device
600/GFR001	Heated probe attachment group
600/TVSR1500ST	Assembling glass nozzles set w/ pipe and nozzles
600/CCTFSIR4	Linking cables (4mt) for heated sonde
600/VT001T	Thermal tank w/ bubblers
600/TGS001K	Trap silica gel
600/CRS029	Glass filter holder 47mm for direct sample
600/CRS029D	Glass filter holder 47mm for derived sample

Filter membranes for mercury sampling in emission

NFS/GF1-47-100	GF1 grade glass fiber (Eq GFA) pkg 100
FAN/MFQ047	47mm quartz fiber filter pkg 25



AMS[®] Analitica

Air Monitoring Systems

P.le Coralloni, 12 - 61122 Pesaro (PU) Italia
Phone +39 0721 26243 Fax: +39 0721 26285
www.amsanalitica.com info@amsanalitica.com

AMS Analitica srl
ISO 9001:2008
Quality management system certified

ISO 9001

BUREAU VERITAS
Certification

