

Dioxins, furans, PCB and POP emission permanent sampler

PROCESS & EMISSION MONITORING SYSTEMS

First and only QAL 1 certified long-term sampling system for dioxin and furan emission monitoring. TÜV and MCERTS certified, ETV EPA approved

The AMESA-D utilizes the water cooled probe method with Isokinetic sampling system coupled with XAD-II adsorbent cartridge for Long-term sampling of dioxins (PCDD), furans (PCDF) and other persistent organic pollutants (POPs).

- + 20 years of expertise
- + 40,000 dioxin analysis
- + 400 AMESA® installed in waste incinerators, cement, power plants, etc.



SPECIFIC FEATURES:

- Isokinetic sampling by a built-in Pitot tube on the sampling probe
- Fully automatic, isokinetic sampling from 15 minutes to 6 weeks (programmable)
- Complies the cooled probe method of CEN/TS 1948-5
- Adsorption on exclusive XAD-II cartridge
- Dioxins of all 3 phases (gaseous, solid and liquid bounded) are collected in one cartridge
- High efficient dust filter
- Fully automated and sampling operating conditions storage
- Cooled probe composed of different materials and lengths to fit the application



AMESA-D
Sampling unit

MAIN APPLICATIONS:

- > Municipal and Hazardous Waste Incinerators
- > Thermal power plants
- > Cement plants
- > Metallurgy plants
- > Paper mills, etc.

COMPLIANCE WITH:



TECHNOLOGY

PRINCIPLE OF OPERATION

The QAL 1 certified AMESA-D system is designed for the long-term sampling of dioxins (PCDD), furans (PCDF), dioxinlike PCBs and other Persistent Organic Pollutants (POPs).

Traditionally, the monitoring of PCDD/Fs is achieved by taking 1 – 3 short-term samples per year (each of 6 - 8 hours).

By permanent sampling over a period of up to 6 weeks, AMESA-D ensures continuous documentation of dioxin/furan emissions for each single sample, thus ensuring that fluctuations in plant operation and in the composition of the fuel are well recorded.

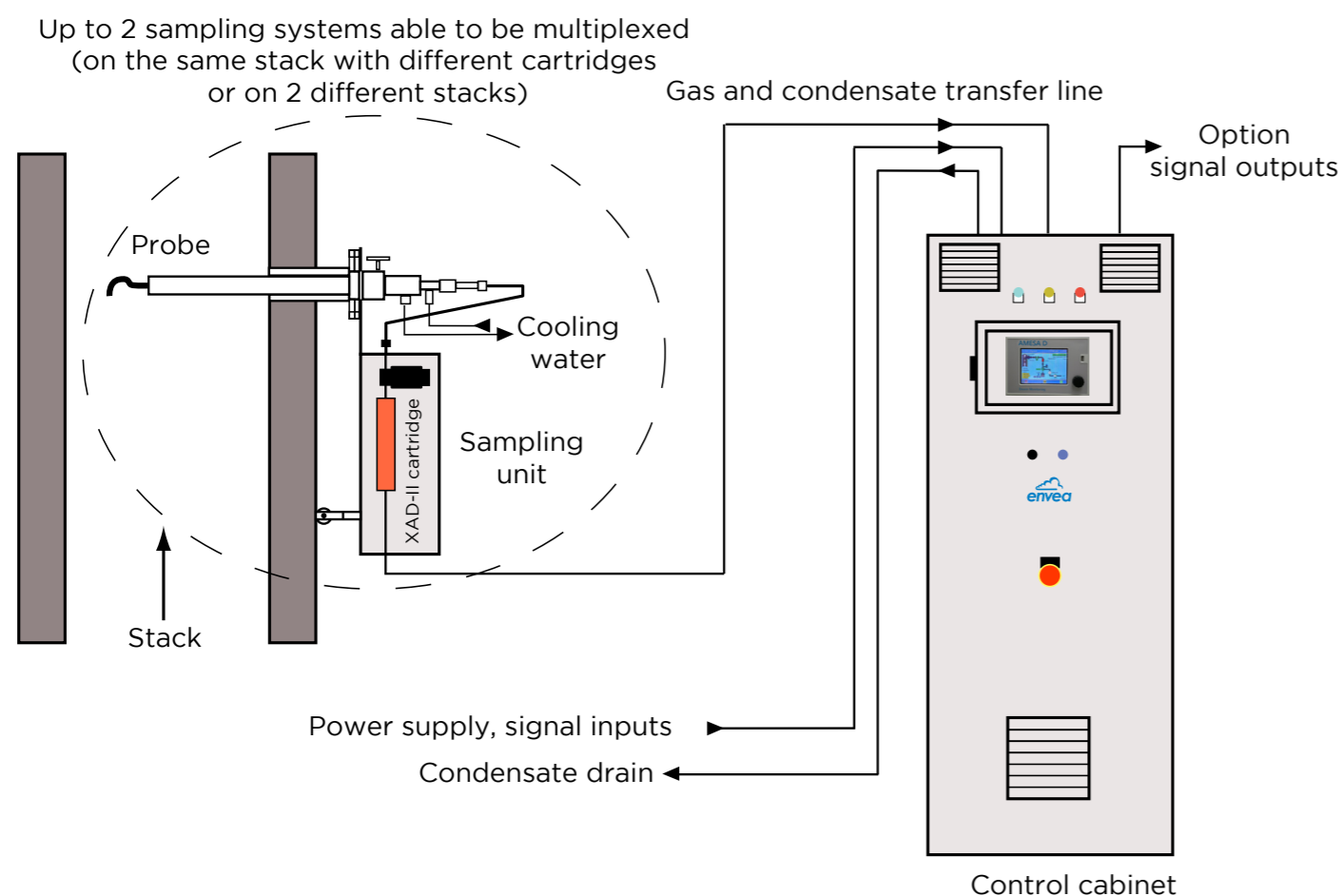
The used principle complies the cooled probe method which is described in CEN/TS 1948-5: a cooled probe (<50 °C) is used to extract a part of the flue gas isokinetically from the stack. Dioxins and furans which are bounded in the gas, the dust and the condensate of the flue gas are adsorbed in a specific cartridge filled with XAD- 2 and a dust filter.

An automatic leakage test is performed before and after the sampling cycle to validate the non-contamination of the adsorption cartridge. After adsorption, the measured gas is pumped through a flexible tube to the control cabinet, where the gas is cooled down (<5 °C) to completely remove the condensate. The isokinetic extraction is controlled continuously as a function of the flue gas velocity, temperature and pressure, by use of a thermal mass flowmeter and a frequency controlled pump.

The dried measured gas flow is determined twice by means of a calibrated gas meter and a thermal mass flowmeter. AMESA-D operates fully automatically and all necessary data is stored internally. The data can be transferred after the sampling e.g. on an USB flash drive. Both the XAD-2 cartridge and the USB flash drive are then send to a specialized laboratory for further analysis of PCDD/PCDF and/or other POPs (e.g. PCBs) and/or PAHs.

The AMESA-D can be equipped with 2 sampling units, thus allowing successive automatic sampling of different pollutants (dioxins, heavy metals...) on the same stack, or multiplexing on different stacks (max. 2) or multiplexing between before and after the Flue Gas Cleaning Device (FGD) to determine and optimize the efficiency of the FGD.

AMESA-D Operating Principle



PRODUCT SPECIFICATIONS

TECHNICAL CHARACTERISTICS

GENERAL DATA	
Measuring range	0.0001-10 ng I-TEQ/m ³ (QAL1 certification range: 0-0.5 ng I-TEQ/m ³)
Sampling interval	from 6 hours up to 6 weeks
Flue gas temperature	up to 70 °C without cooling / up to 400 °C with cooling
Max dust concentration in the flue gas	100 mg/m ³
Flue gas velocity	from 1 up to 30 m/s
Operating temperature (control cabinet)	+5 to + 40 °C (optional air conditioner for temperatures over +40 °C)
Max relative humidity (control cabinet)	50%
Isokinetic control cycle	1 sec
Velocity measurement accuracy	± 1 % of measuring range
Volume measurement accuracy	± 1.5 % of measuring range
Capacity of internal memory	(optional) up to 7 months 1/2 h data
Multiplexing	(optional) up to 2 sampling points

SAMPLING PROBE	
Length	from 350 up to 2000 mm
Probe shaft diameter	60 mm
Free probe tip diameter	from 3 up to 12 mm (mainly 5 and 6 mm)
Stack mounting	DN 100 flange (other flanges upon request)
Material	titanium (glass as an option)

SAMPLING UNIT	
Standard unit dimensions	600 x 600 x 220 mm (H x W x D)
Weight	approx. 32 kg
Adsorbent cartridge	XAD-2



XAD-II cartridge

CONTROL CABINET	
Dimensions	1800 x 600 x 500 mm (H x W x D)
Weight	approx. 185 kg

UTILITIES	
Compressed air	3 to 7 bars, dry, oil free
Compressed air connection	8 x 1 or 6 x 1 mm hose
Cooling water	0.5 to 5 l/min (accord. to fume temperature) (absolutely essential for fume temperature >70 °C Optional closed loop cooler if tap water not available)
Water connection	½" hose (inlet & return)
Power supply	230 VAC, 50 Hz (option 115 V, 50/60 Hz)
Power consumption	Control cabinet: approx. 0.85 kW Control cabinet with side wall air conditioner: approx. 1 kW Cartridge box: 0,25 kW
Fuse	Control cabinet: 16 A Cartridge box: 6 A

UTILITIES	
Digital outputs	status (monitoring mode, fault, error)
Digital inputs	furnace off, maintenance
Analog inputs (optional)	O ₂ , CO ₂ , flue gas velocity, - temperature, static pressure
Analog outputs (optional)	flue gas velocity, flue gas temperature, static pressure, availability
Power supply	230 VAC, 50 Hz (option 115 V, 50/60 Hz)
Digital communication to Data Acquisition System (DAS) with MODBUS communication	

DISPOSAL	
Flue gas recycling	8 x 1 mm hose
Condensate drain	8 x 1 mm hose
Condensate quantity	approx 3 l/day (depending on flue gas moisture content)



AMESA® sampling probe

Dioxins, furans and PCB emission permanent sampler **AMESA-D****CERTIFICATIONS:**

The AMESA-D System is QAL 1 certified and was published on the 1st of April 2014 by the Federal Ministry of Justice and Consumer Protection in the German Federal Gazette as type performance tested. Nowadays, the AMESA-D system is the only instrument on the market for long-term sampling of dioxins, which is QAL 1 certified. The normative Annex C of CEN/TS 1948-5 requires a type performance test for each system which should be used for this application.

Before the QAL 1 certification the AMESA® system passed several Type Performance Tests and certifications as follows:

In 1997, the patented AMESA® system successfully passed a Type Performance Test carried out by TÜV Rheinland (No: 936/808017A 12.8.1997) according to the EU notified minimum requirements for long-term sampling systems (EU notification 97/26/D). Therefore AMESA® was published in the German Joint Ministerial Gazette (GMBI, 13 January 1998, page 10) issued by the Federal Ministry of the Environment, Conservation and Reactor Safety (BMU).

In 2002, AMESA® obtained the TÜV Approval according to the TUVdotCom regulations (TUVdotCom-ID: 0011005400, type approval no. 936/805017B).

In addition to the performance test, such an approval included already a yearly audit by TÜV similar to the later published EN 15267, which assures that the actual AMESA® systems produced conform to the test requirements during the performance test.

In 2005, after a 3-month field trial and laboratory tests, AMESA® received the MCERTs-certification (no. Sira MC 050064/00), based on the "MCERTs Performance Standards and Test procedures for Automatic Isokinetic Samplers Version 2".

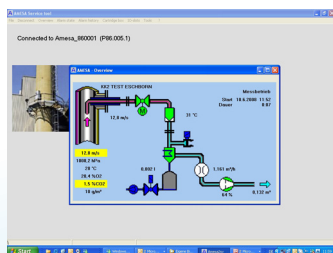
All measurement devices of AMESA®, which are needed to assure a correct sampling, (volume measurement, isokinetic control, temperature and pressure measurement etc.) were very intensively tested during the TÜV and MCERTs tests, thus ensuring a perfect calculation of the average dioxin concentration over the sampling time.

The most relevant tests are those related to the adsorption characteristics of the system (e.g. possible break-through of dioxins through the cartridge, possible losses of dioxins in the sampling line and condensate etc.), which are exclusively performed in the more stringent QAL1 and TÜV type performance test.

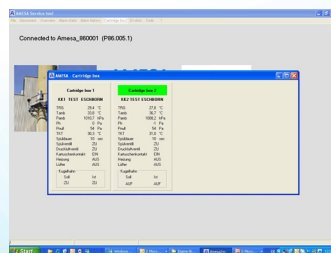
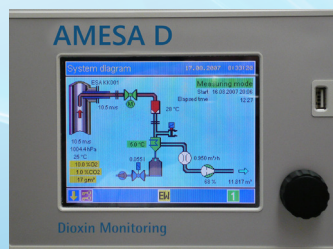
AMESA SV REMOTE CONTROL:

AMESA SV allows the remote control of AMESA® units by serial link:

- Simultaneous control of 1 up to 4 AMESA® units per location
- Detailed display of operating conditions, status, errors, configuration data and diagnosis
- Operates under Windows™



Overview window

Cartridge box window
Control cabinet

LCD display

MAIN OPTIONS:

- Automatic multiplexing (up to 2 sampling units)
- Sampling probe cooler
- USB flash drive
- XAD II cartridge- transportation box for XAD II cartridge
- Integrated non heated dust filter for separate analysis of particle bounded dioxins and gaseous dioxins
- AMESADAT software to read the sampling protocol from the USB flash drive
- AMESA-SV remote monitoring software via TCP/IP connection or wireless router

