

**Attachment J1.2
Brochure**

AMESA Dioxin/furan Monitoring System

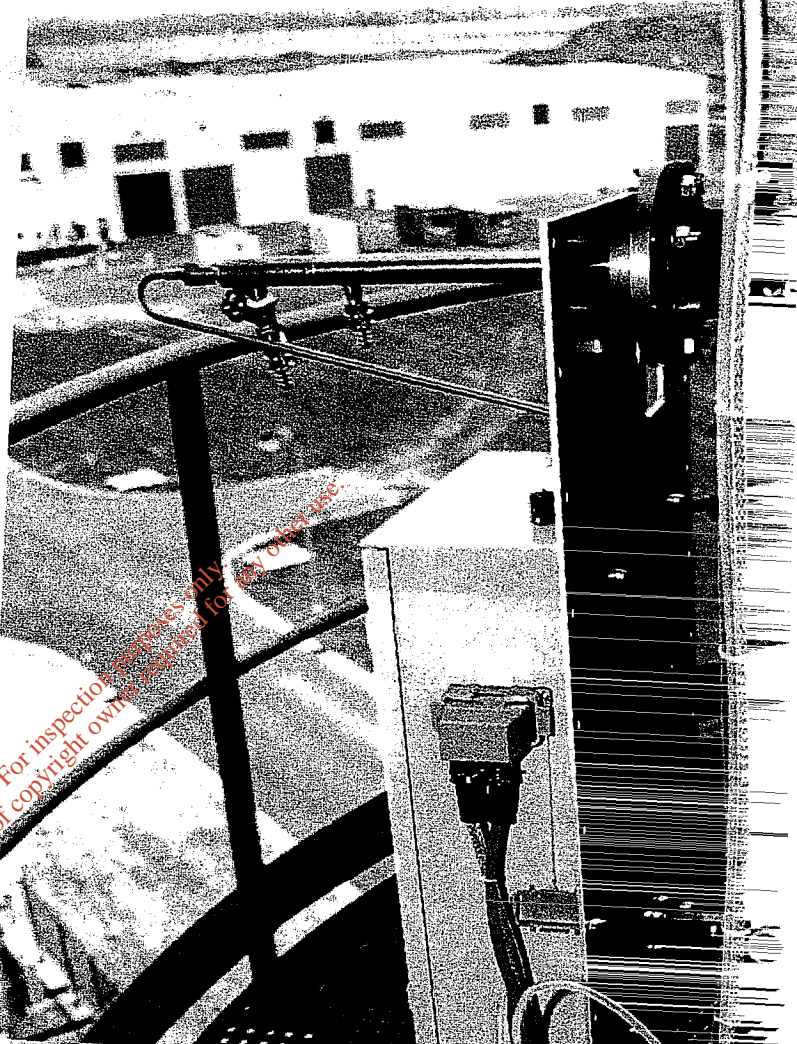
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AMESA

 becker
messtechnik

(Adsorption Method for Sampling
of Dioxins and Furans)

Continuous dioxin-/
furan-monitoring
without interruption
with the first certi-
fied dioxin-/furan-
monitoring-system
according to the
German environ-
mental regulation
17. BImSchV.



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Eignungsgeprüft nach den Richtlinien des Bundesministers
für Umwelt, Naturschutz und Reaktorsicherheit

**TÜV Rheinland
Sicherheit und Umweltschutz**
Institut für Umweltschutz
und Energietechnik
Pr. A. Nr.: 936029





AMESA control cabinets
for monitoring 2 lines
simultaneously

Application

The officially approved AMESA monitoring system is used for measuring dioxin/furan emissions in plants which have to be approved and are subject to the 17. BImSchV and TA Luft.

The recommendation of the 17. BImSchV to measure the concentrations of dioxins and furans in pure gas on a continuous basis can be implemented for the first time with AMESA.

The AMESA can be used, for example, in refuse incinerators, hazardous material incinerators, plants for the production of iron, steel and non-ferrous metals as well as metal recycling plants. In these plants the AMESA helps determine the production and retention rates and measures emissions before and after various flue gas cleaning systems, such as, for example:

- ▲ Activated charcoal filters (different types), e.g. for monitoring PCDF/D retention rate
- ▲ Dry electrostatic precipitators
- ▲ Wet electrostatic precipitators
- ▲ Dust cyclones
- ▲ Spray absorbers
- ▲ Wet scrubbers
- ▲ Fabric filters (with and without prior injection of solids containing activated charcoal)
- ▲ Flue stream reactors
- ▲ Catalytic converters.

Furthermore, the AMESA is used for the following applications:

- ▲ Monitoring and optimizing the built-in dioxin reduction stages
- ▲ Monitoring the possibility of using other fuels, e. g. in refuse incineration
- ▲ Monitoring starting and shut-down procedures in furnaces
- ▲ Checking memory effects

Outdoor-installation
on flue

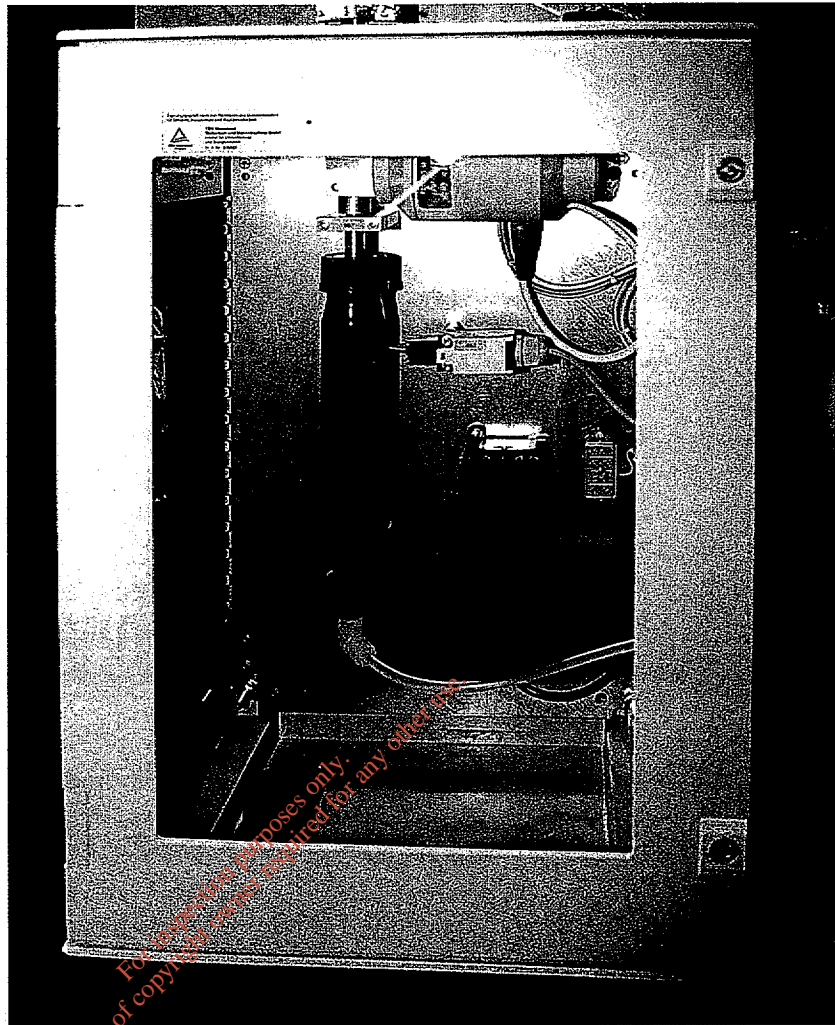


Special Features

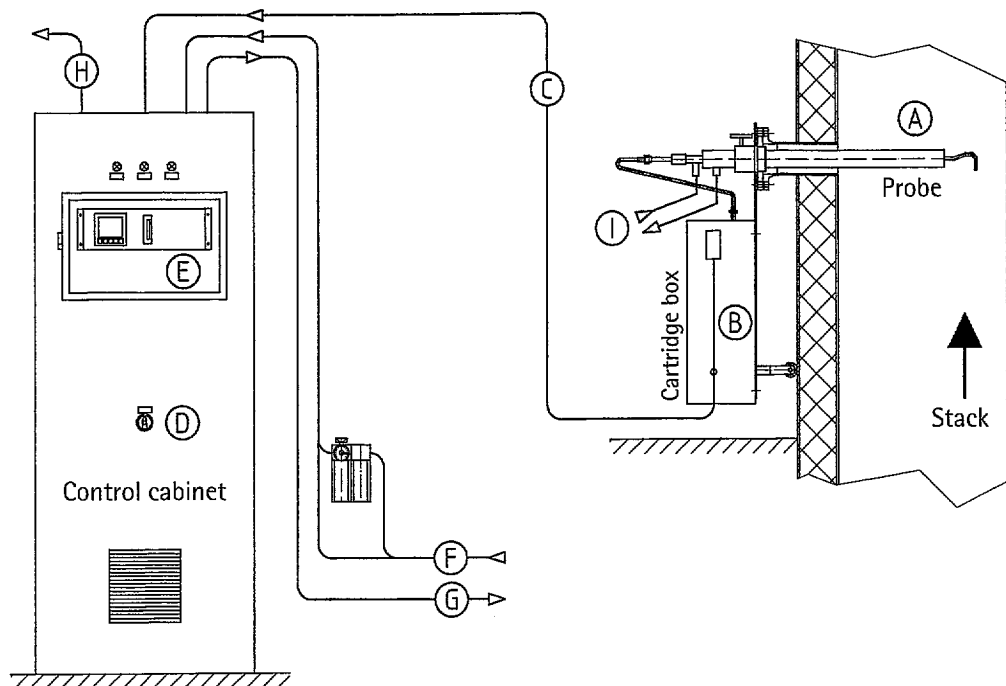
- ▲ Uses the well-known adsorption method
 - ▲ Continuous automatic measurement
 - ▲ Fully automatic recording and taking of mixed sample over a period of up to 30 days.
 - ▲ Guaranteeing continuous emission monitoring in respect of dioxins and furans
 - ▲ Information on monthly mean value of dioxin/furan emissions by analysis of mixed sample (XAD-II cartridge) in laboratory
 - ▲ Additional information on flue gas velocity, sample gas flow volume, Oxygen content, flue gas temperature and cartridge temperature as half-hourly average
 - ▲ No collection of condensate and none of the associated handling problems during monitoring over long periods
 - ▲ Broadly based measuring range for dioxin/furan concentrations between 0.0001 and 10 ng/m³ (as TE to NATO CCMS model). The measuring range 0-0,2 ng/m³ is certified.
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- All these features offer plant operators the following benefits:
- ▲ Reduced running costs by minimizing the use of additives
 - ▲ Reduced costs by optimizing the built-in dioxin reduction stages
 - ▲ Minimizing running and maintenance costs by monitoring the reduction in furnace temperature
 - ▲ Better utilization of plant capacity by using other possible fuels (e. g. in refuse incineration)
 - ▲ Achieving a "transparent flue" and the environmental acceptance that goes with it

Functional Principle

The dioxin/furan monitoring system AMESA extracts a volume stream constantly and isokinetically from flue gas. Dioxins and furans are collected on a cartridge filled with adsorber resin. In 1993 this adsorption method was the first and only method, which was accepted official by the german authorities to be suitable to control the dioxin emission limit value of 0,1 ng ITE/m³. AMESA operates fully automatically and stores all necessary data both internally and on a removable SRAM card.

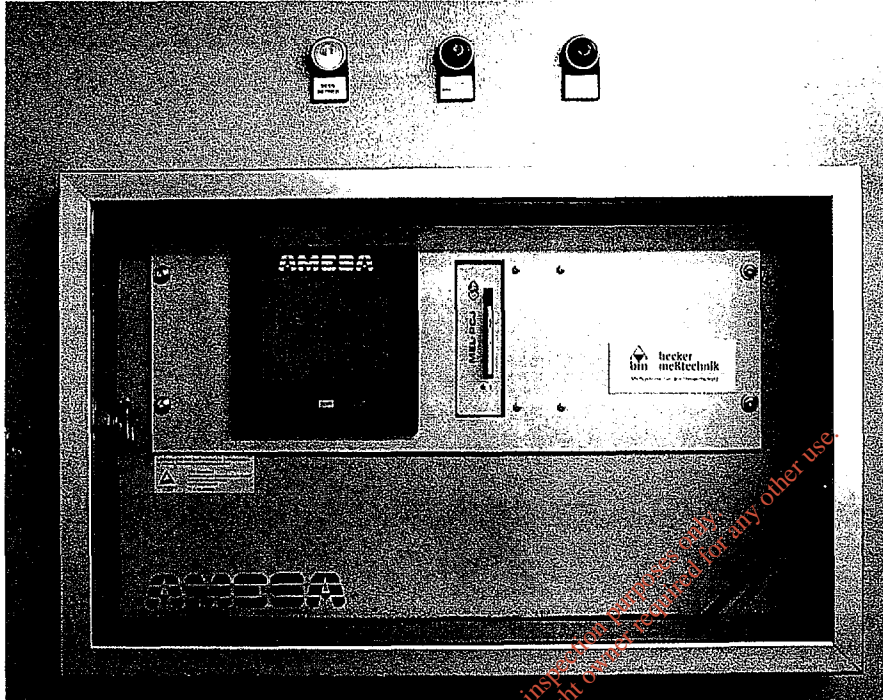


Cartridge box incl. the XAD-II-cartridge

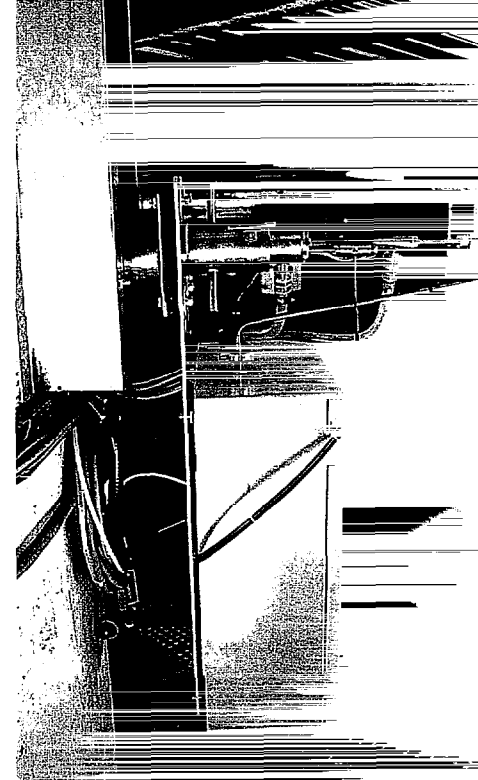


The dioxins and furans (PCDD/PCDF) are collected in the adsorption cartridge over a variable period between 6 hours and 4 weeks. To determine the quantity of the collected dioxins and furans the cartridge and the

SRAM memory card has to be analysed by a laboratory which is familiar with the analysis of PCDD/PCDF-adsorber cartridges.



AMESA control, including SRAM card drive



Sampling probe with cartridge case mounted on flue

- (A) Cooled ($< 70^{\circ}\text{C}$) titanium probe for isokinetic extraction of a volume stream.
- (B) Measurement stream and condensate are drawn through the cartridge filled with adsorber resin (quartz wool as a prefilter).
- (C) Measurement stream and condensate are drawn through the measuring gas line to the control cabinet.
- (D) Control cabinet with separation of the condensate by cooling ($< 5^{\circ}\text{C}$) and infinitely variable control of the isokinetical extraction.
- (E) User-friendly operation of AMESA by menu dialogue in process controller. Data input for plant specific parameters and operation by means of keyboard and LCD-monitor. Analysis of the emission values by means of SRAM memory chip and analysis results.
- (F) Compressed air, power supply and input signal conduits.
- (G) Condensate drain and flue gas recycling
- (H) Signal output (optional)
- (I) Coolant connection (if $T_{\text{Fluegas}} > 70^{\circ}\text{C}$)

The following methods of operation are possible by a long term monitoring with AMESA:

Method of Operation	Sampling Time	Number of Samplings per Year	Number of Analysis per Year	Description
1	4 Weeks	13	13	Continuous dioxin-/furan-monitoring without interruption according to the German environmental regulation 17. BImSchV § 10 (1), § 11 (5) for every month (4 weeks) one dioxin/furan analysis is available
2	1 Week	52	variable eg. 5	continuous dioxin/furan monitoring Authority defines when an analysis has to be done in case of interruption a dioxin/furan analysis can be done afterwards the cartridges can be stored 6 months after the sampling (approved by TÜV)
3	Period 4 Weeks active measurement eg. 6 x1 hours/4 Weeks 16x1 hours/4 Weeks	variable eg. 13	variable eg. 3	Authority/operator defines when a sampling will be started Authority/operator defines when an analysis has to be done
4	6-16 hours	3	3	Measuring time and quantity of samples acc. 17. BImSchV, § 13 (2) (3) The results of the analysis and measuring method of AMESA are approved in comparison to the filter/cooler method (acc. EN 1948-1 dated 1 May of 1997) by measurements of validity

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Technical Data

General Data

Measuring range for dioxin / furan	0,0001 – 10ng TE / m ³
Sampling interval	6 hours to 4 weeks
Flue gas temperature	up to 70 °C without cooling up to 400°C with cooling
Dust content of flue gas	up to 20 mg/m ³
Flue gas velocity	2 – 30 m/s
Ambient conditions	5 – 40°C, max. 50% rel. humidity
Isokinetic control cycle	1 sec
Accuracy of velocity measurement	± 1 % of measuring range
Accuracy of determining volume	± 1,5 % of measuring range
Digital outputs	Status: Monitoring mode, break, fault
Digital inputs	Furnace off, analyser maintenance
Analogue inputs	O ₂ , CO ₂ , flue gas velocity or standard or operating flow volume, flue gas temperature static pressure in flue gas duct

Electrical Data

Power supply	230 V, 50 Hz
Fuse	16 A
Power consumption	approx. 1,1 kW

Mechanical Data

Compressed air connection	8×1mm or 6×1mm hose
Compressed air supply	3 to 7 bar, dry, oil-free
Coolant connection	Inlet and return hose 1/2"
	Consumption approx. 0.5–5 litres/min (depending on flue gas temperature) Absolutely essential in case of flue gas >70°C

Disposal

Flue gas recycling	8×1mm hose
Condensate drain	8×1mm hose
Condensate quantity	approx. 3 litres/day (depending on flue gas moisture content)

Sampling Probe

Probe length	750 to 2000 mm
Probe shaft diameter	60 mm
Minimum nominal diameter probe connection	DN 100
Clear diameter of probe tip	4 mm
Probe material	Titanium, (glass optional)
Thread of probe holder	G3 DIN ISO 228 external thread
Dimensions control cabinet (HxWxD)	2100 × 800 × 650 mm
Dimensions cartridge case (HxWxD)	650 × 450 × 250 mm
Dim. waterproof protection box (HxWxD)	1150 × 650 × 500 mm
Total weight control cabinet	approx. 250 kg

Subject to change
without notice

Accessories

- ▲ XAD-II cartridges
- ▲ Transportation box of XAD-II cartridges
- ▲ License for software to read the memory card of AMESADOS, incl. driver for SRAM-card
- ▲ Memory card, SRAM 1 MB
- ▲ up to 3 outputs 4–20 mA for Pstat-stack, Vfluegas, Tfluegas
- ▲ AMLEIT remote control

For outdoor installation

- ▲ Weather proof casing incl. heating

For outdoor temperatures < 0°C

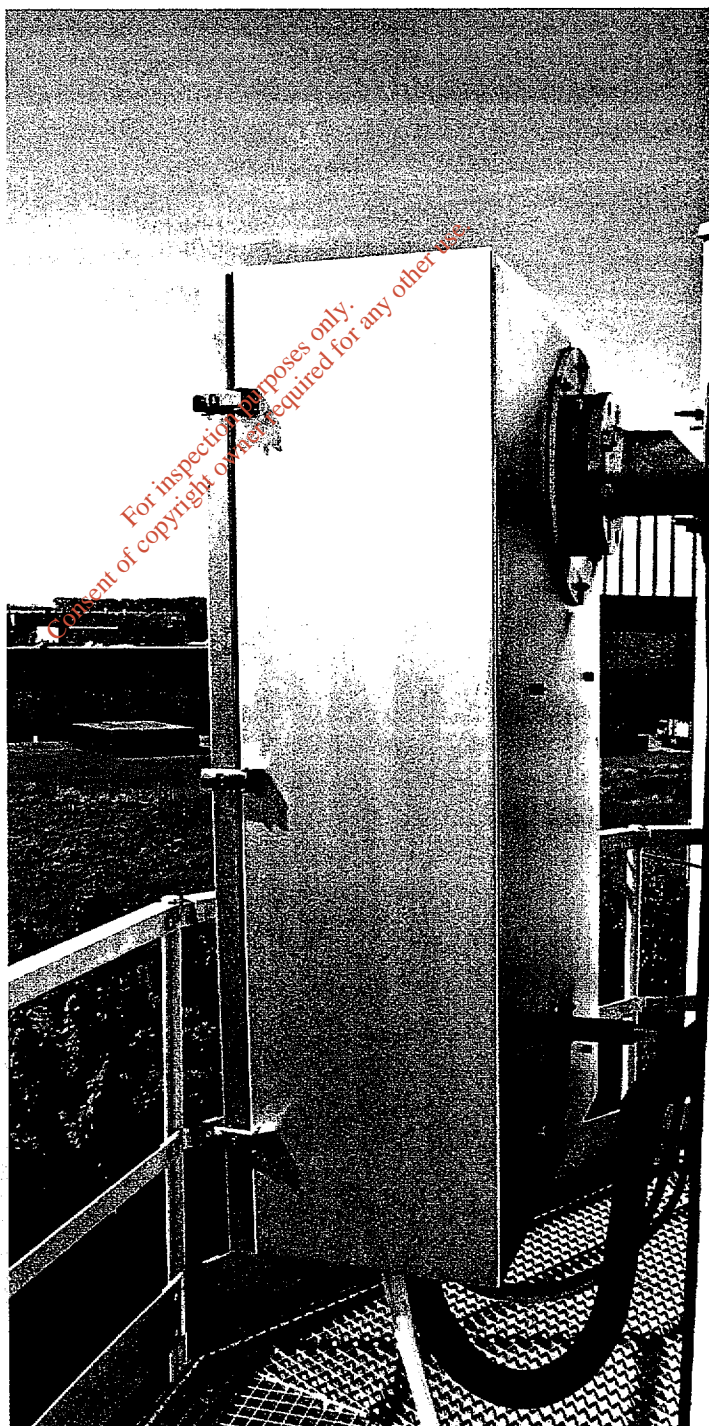
- ▲ Extraction hose incl. electrical heating

If no cooling water is available

- ▲ Radiator unit

Additional analysis (in combination with PCDF/D analysis)

- ▲ PBDF/D, PBCDF/D
- ▲ PCB-/PCBz-analysis (Sum of Tri- up to DecaCB, 6 DIN- + 12 WHO-Kongenere; Penta- and HexaCBz)
- ▲ PCPh-analysis (10 tri- up to pentachloride congeners)
- ▲ PAH-analysis (21 PAH-components)



Weather-proof housing for sampling probe and cartridge case



*Sampling probe with cartridge case
mounted in Weather-proof housing*

AMLEIT remote monitoring

The AMLEIT system is designed for remote monitoring of AMESA sampling systems.

Features

- ▲ Worldwide use by way of data exchange per modem via telephone network
- ▲ Simultaneous monitoring of 1 to 4 AMESA per location
- ▲ Detailed display of
Operating conditions
Alarms
Configuration and diagnosis data
- ▲ Service support by way of status display

Hardware

Location

- ▲ Direct-dial telephone connection (provided by customer)
- ▲ AMLEIT coupling unit for connecting 1 to 4 control cabinets
- ▲ Connecting line between the individual AMESAs and the coupling unit

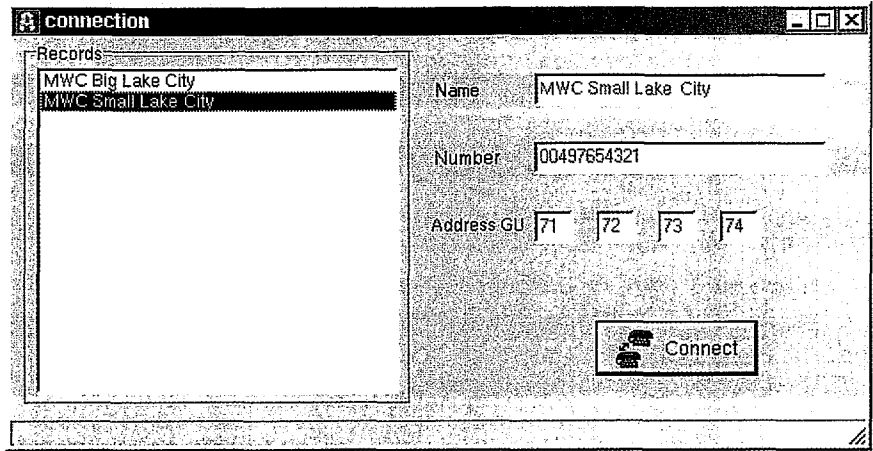
Monitoring

- ▲ Telephone connection with line authorization
- ▲ Modem or AVM Fritz card
- ▲ PC (see Technical Data)
- ▲ AMLEIT requires Win95/98.

Functions

Dial location

The **connection** menu enables a location to be selected from the telephone book. The connection to the selected location is established with the **Connect** button.



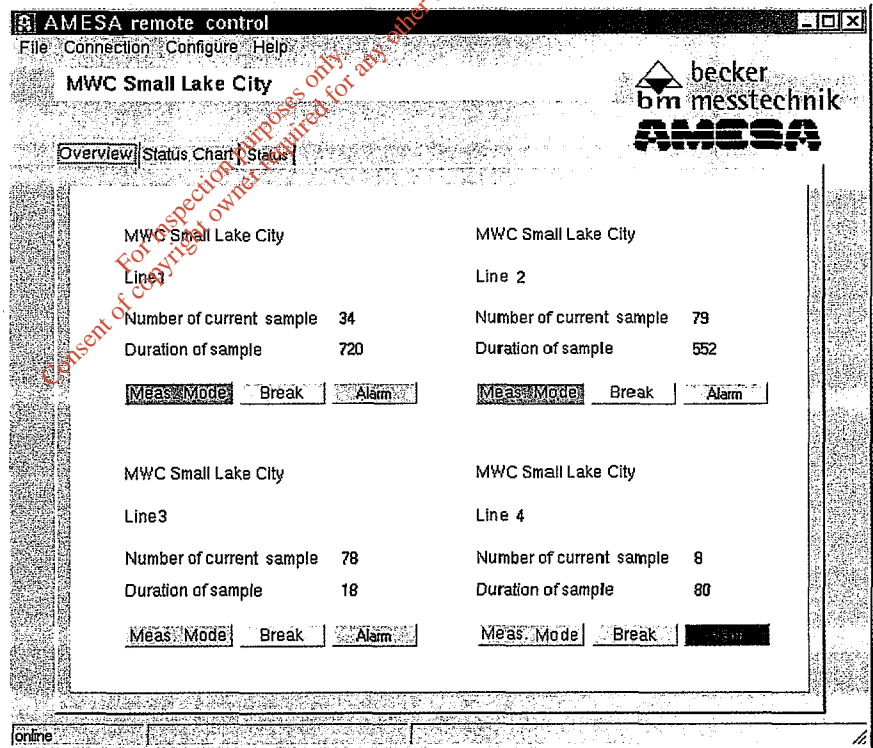
Dial location

The **Overview** appears as soon as the connection is established.

It shows the data of all the location's lines which are necessary for a quick assessment of the situation:

- ▲ Operator name and line
- ▲ Number of current or last sample
- ▲ Duration of sample
- ▲ Operating status: Measuring mode, break or alarm

One of the lines can be selected for closer inspection by clicking on it with the mouse.



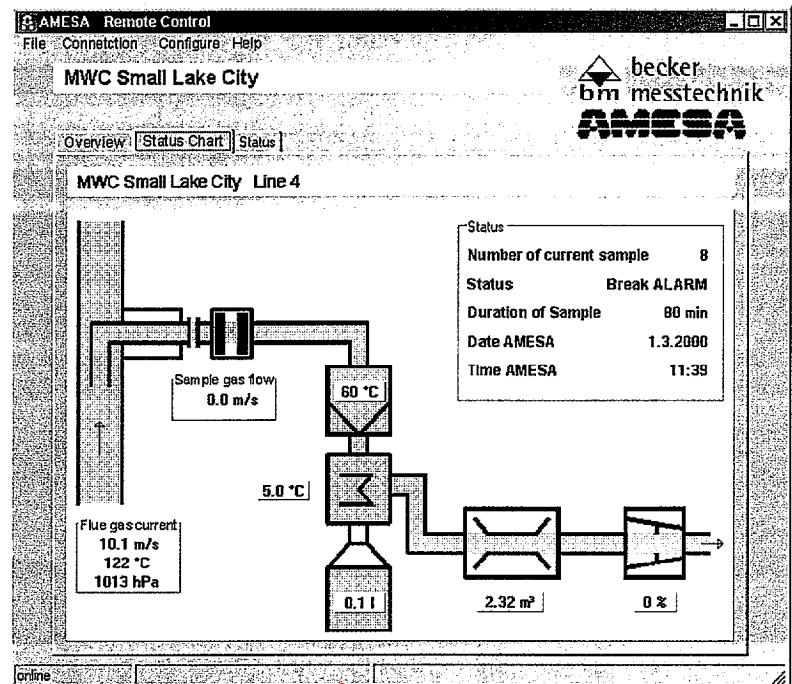
Overview

Two further windows are normally available for the line selected:

1. The status chart

The status chart shows a diagram of the plant with the main parts of the AMESA system and the current operating data, such as:

- ▲ Static pressure in flue in hPa
- ▲ Flue gas velocity in m/s
- ▲ Flue gas temperature in °C
- ▲ Sample gas flow velocity in m/s
- ▲ Cartridge temperature in °C
- ▲ Temperature in gas cooler in °C
- ▲ Cumulative condensate volume in liters
- ▲ Cumulative gas throughput in Nm³
- ▲ Pump speed in %

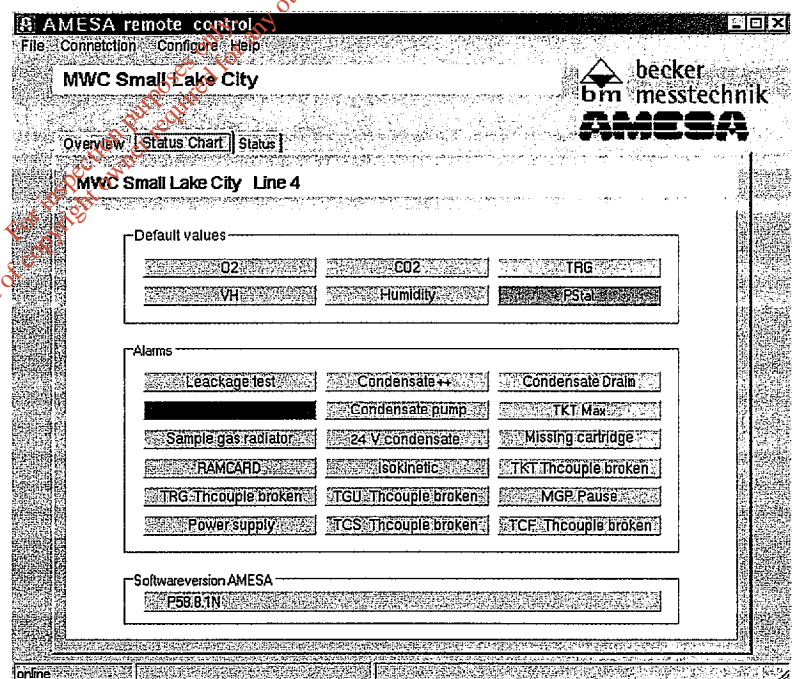


Status chart

2. Status

Status shows an overview of all default values and all alarms. Active elements are highlighted in colour. The latest software version of the AMESA is an important source of information for service technicians.

A third Service window can be enabled and permits the display of the complete configuration of the selected AMESA system, including all test menus for service purposes.



Status

Technical Data

Coupling unit

- Connection to the AMESA units via a RS422 bus.
- External connection via an analog telephone connection

Monitoring

Minimum requirements:

- Pentium PC with 32 MByte RAM
- Monitor with min. resolution of 800x600
- A free COM interface
- Windows95 or Windows98

Modem:

- ELSA MicroLink 28.8 TQV or 33.6 TQV for analog telephone line (other modems may work, but this cannot be guarantee)
- or
- AVM Fritz card with analog modem emulation for ISDN connection

