



# CLSA 9000

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alternative to Purge and  
Trap systems**

is easy to install, set up, run and maintain...

will lower your costs per analysis...

allows detection of organics in water at low ppb levels...



## CLSA 9000

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If you are looking for a system that...

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will lower your costs per analysis...

allows detection of organics in water at low ppb levels...

...then you should take a close look at the CLSA 9000 ... now!

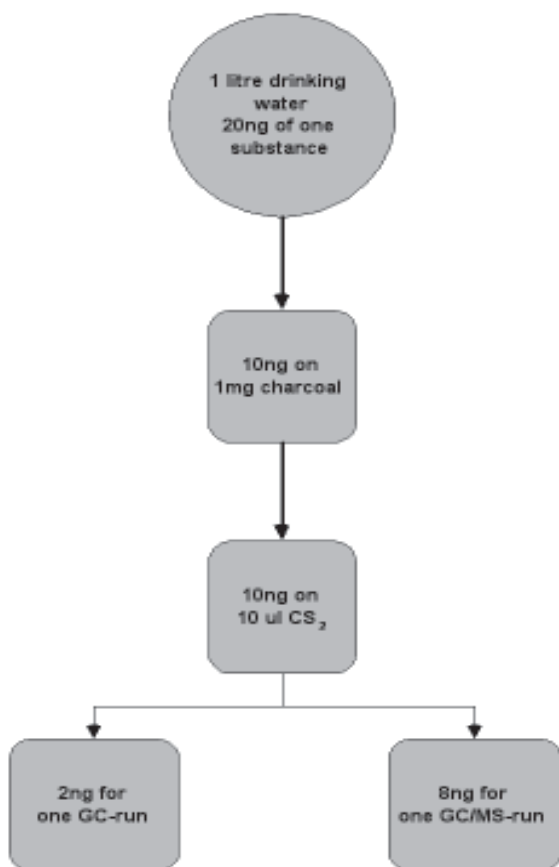
### How the CLSA method works

Organic substances are liberated from drinking water and transferred to a very small amount of charcoal in a hermetically closed circuit system, in which the carrier may be air or an inert gas. The organic substances are dissolved from the charcoal, separated by Capillary Gas Chromatography (GC) and

identified by Gaschromatography/Mass Spectrometry (GC/MS). In unpolluted water, hundreds of substances up to C24 are detected at concentrations down to 1 in 10<sup>13</sup> (w/w).



### Scheme of the analysis



### Take full advantage of the CLSA method

**Almost no problems with purity of purge gas**  
due to the closed loop system, impurities in the relatively small volume of purge gas are negligible.

**Minimum artifacts due to filter bed material**  
the method works with very small amounts of trapping material (usually 1.5 mg of activated charcoal).

**Extremely clean blanks**  
the sample extraction involves only 5-15 µl of CS<sub>2</sub> or other solvents.

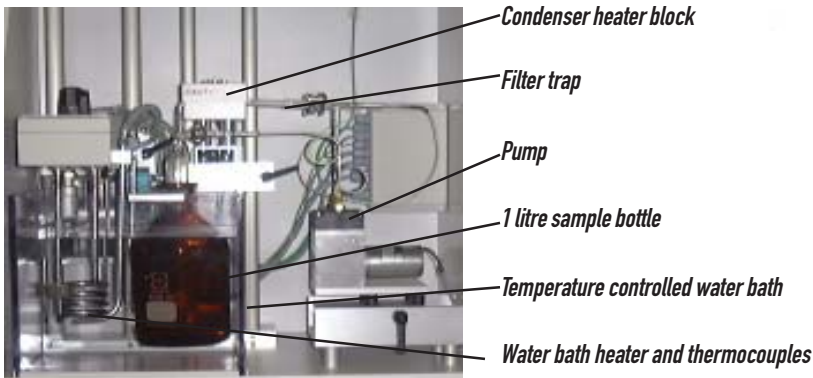
**Ultrahigh sensitivity**  
good mass spectra can be obtained for most purgeable compounds in the 1-10 ppt range (ng/litre)

**Easy to run**  
filter traps are easily accessible and exchangeable. Short solvent extraction times (usually about 10 minutes) facilitate the routine work.

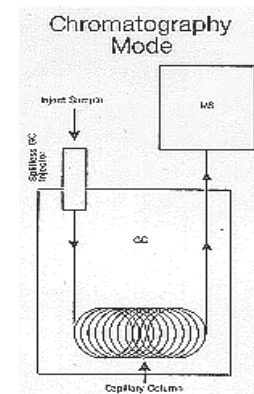
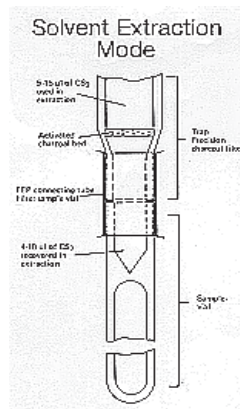
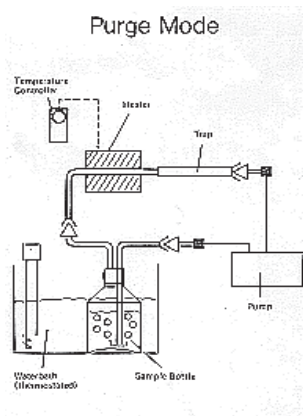
**Method limitations:**  
Recovery of highly volatile compounds such as chloromethane, methylene chloride, chloroform etc. is somewhat poor. However, the small breakthrough of these compounds does not eliminate them completely, because, due to the closed loop system, these compounds are continuously reloaded on the filter trap.

## CLSA 9000 features

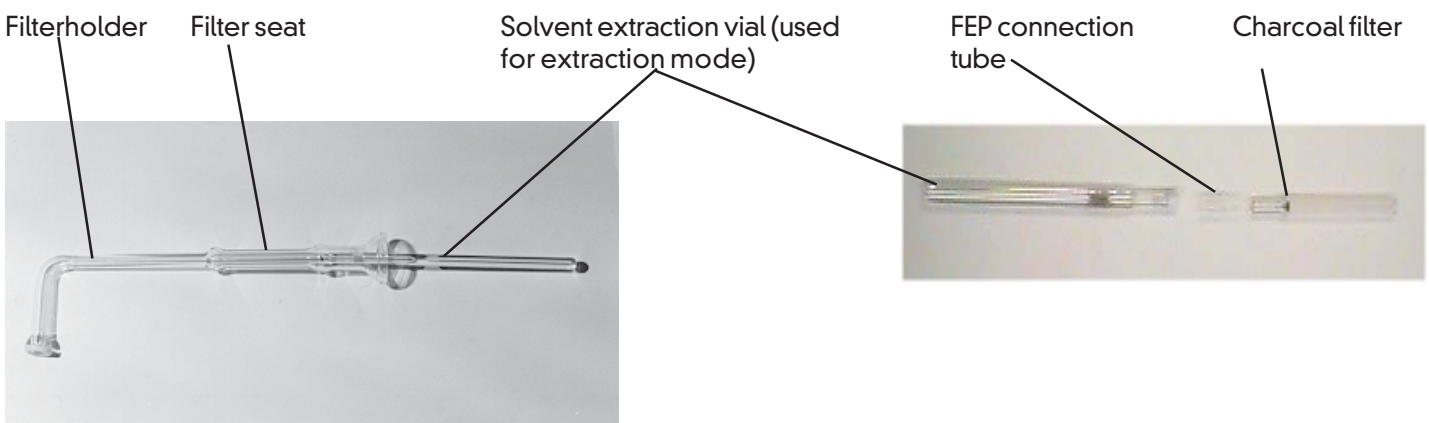
- New robust design
- Simple software design
- Easy to handle
- Automatic start and shut down
- More safety due to low voltage heaters and pumps
- Liquid level survey
- Printer option available
- Glass parts, filters and consumables are fully compatible to the CLSA-2 systems



## The operating modes



## Filterholder- and filter design



**Charcoal versus Tenax**

Tenax is often used as adsorbent because of its relative ease of direct, thermal desorption of trapped organics. However, this experience is only one point out of a more complete picture which should be considered:

The activity of charcoal is roughly 100 times larger. This makes it possible to use a 100 times smaller filter for the same analytical purpose.

On charcoal, organics down to methane are adsorbed, while the limit of substances reasonably trapped on Tenax is in the range of pentane or methylene chloride.

The easy thermal desorption of organics from Tenax is of no essential importance since the most volatile substances that can be determined with Tenax (by thermal desorption) and with charcoal (by solvent desorption) are practically the same.

Liquid desorption from charcoal provides a far broader volatility range of substances as compared to thermal desorption from Tenax.

Thermal desorption from charcoal is recommended for the most volatile organics which are not reasonably trapped on Tenax.

**Charcoal filters**

The selected type of charcoal is characterized by an extraordinary activity which is achieved purely by thermal activation, no activation steps with additives generating catalytic activity have been used. This assures full recovery, by liquid desorption, of even sensitive substances.

The filter bed has been kept as small as possible to trap organics to their highest possible concentration. This permits desorption with a minimum volume of solvent or gas, thus yielding optimum conditions for the subsequent GC analysis. Depending on the amount of organics to be trapped, different sizes of the filter bed are available, containing different quantities of charcoal.

The charcoal particles are firmly located between two screen discs of nickel plated steel, the edges of which are fused into the glass to keep the discs in an exactly parallel position. The glass filter body is precisely ground to fit the filter holder of the CLSA 2 system (no additional fittings are needed).

Charcoal filters can be reused several times, if external influences such as physical damage or plugging by dust particles or by insoluble deposits are avoided. It is sufficient to perform a simple cleaning step. Proper cleaning fully restores the original activity which is not lost during regular long term use.

Cleaning is easily and quickly carried out by sucking solvents through the filter. After an intermediate rinsing with acetone, also water containing acids, bases or detergents can be sucked through. No specific reactivation, particularly no heat treatment, should be applied.

The CLSA method is also suitable for other applicational areas where organics must be extracted from matrixes like packing materials (plastic, polymers, wrapping foils), wood, soil, food samples, tobacco.

**Ordering informations**

<i>Part No.</i>	<i>Description</i>
	<i>Base Unit</i>
9 1006004	CLSA 9000 System 230V 50Hz / 115 Volt 60Hz

*The CLSA 9000 system is delivered together with:*

1 sample bottle (1 litre)	1 special sample vial with PTFE stopper for 1.5mg filter
1 precision charcoal filter (1.5mg)	1 FEP connection tube for 1.5mg filter

*Accessories / Spare parts*

9 1006010	Prec. charcoal filter (1.5mg)
9 1006012	Prec. charcoal filter (1.5mg) LR
9 1006015	Prec. charcoal filter (5mg)
9 1006020	Spec. sample vial cpl. for 1.5mg
9 1006025	Spec. sample vial compl. for 5mg
9 1006030	FEP conn. tube for 1.5mg filter (10)
9 1006035	FEP conn. tubes (5mg filter) (10)
9 1006040	Filter holder only (bent)
9 1006066	Spec. gl. circuit (solid sampl.)
9 1006067	Spec. gl. circuit (liquid sampl.)
9 1006068	Spec. gl. circuit for TDAS tubes
<b>9 1006061</b>	<b>Water bath container (PC)</b>
<b>9 1006142</b>	<b>Pump head complete for pump N815 KTDC (purge circuit)</b>
<b>9 1006146</b>	<b>Pump head complete for pump NF1000 TTDC (liquid circulation water bath)</b>

Manufactured by:

Distributed by:



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