CAA-ContinuousAutoAnalyser

- Real continuous analyser
- Various applications
- Automatic calibration
- Automatic cleaning

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CAA-ContinuousAutoAnalyser

The basic concept of the CAA ContinousAutoAnalyser is to offer an instrument for real continuous automatic monitoring of a wide range of parameters in liquid samples. Although related to analytical technics like FIA (Flow injection analysis), CFA (Continuous flow analysis) or SFA (Segmented flow analysis) it differs from these techniques. These are used to analyse many different samples with a high through put. On the contrary the CAA analyses the same sample (stream) continuously. The advantage are real continuous analytic data offering the possibility to calculate the load of contaminants even if rapid changes in concentration may occur.

For some parameters like Ammonia it´s even possible to obtain almost real time data with delay times as low as 30 seconds (T_{90}).

Analytical methodology

The analytical technics applied in the CAA are

- **Potentiometry**
- **Conductivity**
- **Photometry**
- **Fluorimetry**

Parameters

The list of parameters that can be monitored by the CAA is very long! The following list just gives a selection:

- **Ammonium**
- **POC/VOC (Purgable/Volatile organic carbon)**
- **TOC (Total organic Carbon)**
- **Cyanide**
- **Heavy metals (Ni, Mn, Cu, Fe….)**
- **Ethylene oxide**
- **etc.**

Electronics

The electronic for control and calculation is based on an up to date controller of Siemens that offers a wide range of options.

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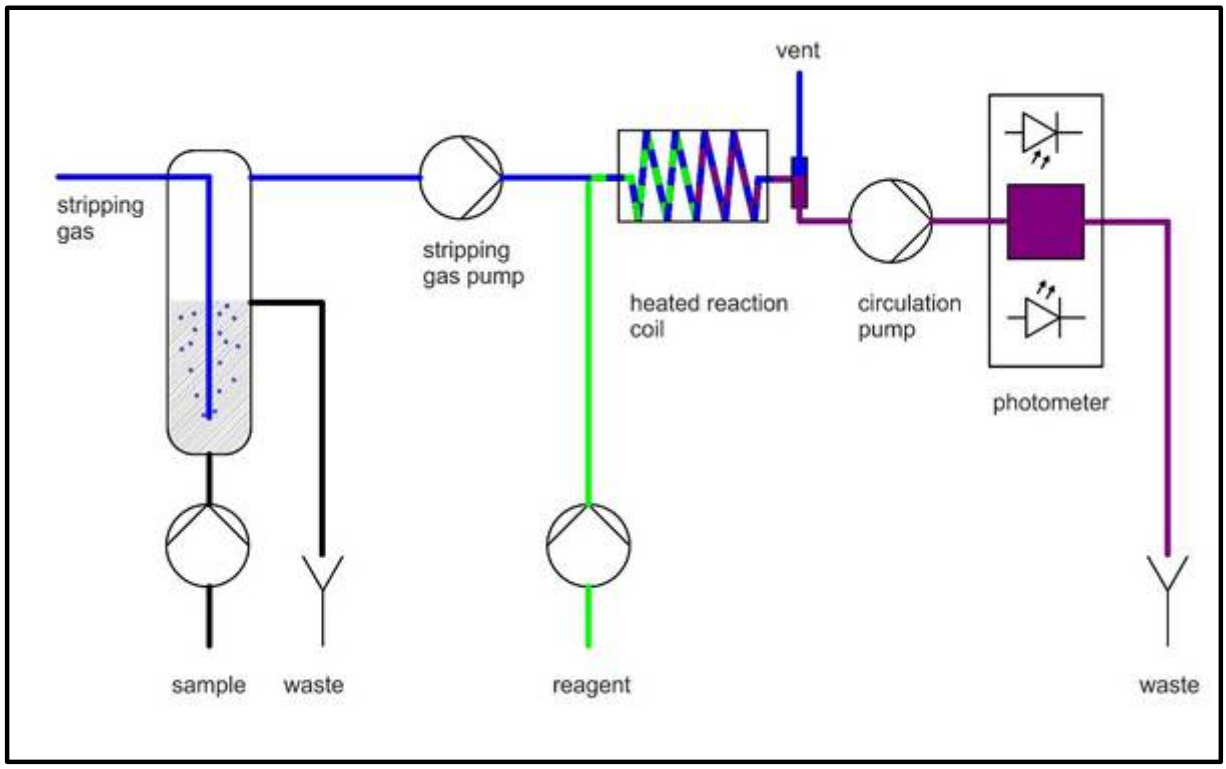
Modules

The basic instrument consists of a number of pumps, valves and the detection device.

Additional modules are:

- **Heaters**
- **Diffusion modules**
- **Phase separators**
- **UV-digesters**

The following scheme shows the principle lay out of the CAA for the determination of ethylene oxide in Glycol/water mixtures:



Temperature compensation

All potentials of the measurement chain are temperature-dependent. Therefore it is necessary take temperature effects into account. A temperature sensor and mathematical temperature compensations are implemented in the instrument.

Options

Depending on the users requirements the following options are available:

- **Automatic cell and line cleaning**
- **Automatic filtration and filter cleaning**
- **Automatic calibration and/or validation**

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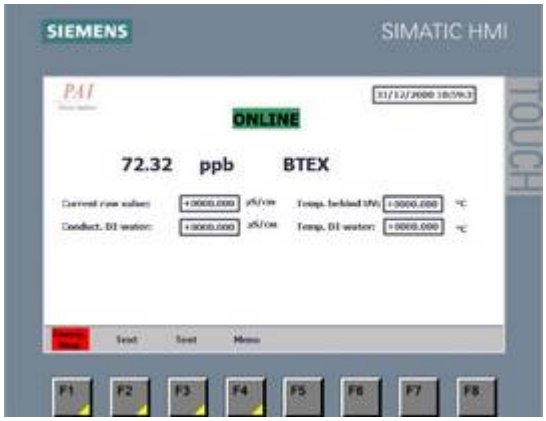
Setup

The CAA-Analyser consists of two separated housings to protect the electronics from any hazardous vapours and liquids. The upper part containing all electronic parts made of powder coated steel. Whereas the lower part is made out of plastic.

To maintain a maximum of reliability all parts are carefully chosen and thoroughly tested.

Operation



The instrument has an inbuild touch screen with functional keys that allows the configuration and manual control of the CAA-analyser. The results are displayed in numerical or as a graphical presentation of historical data.

Communication

To transmit the results to process control systems an analog output ((0)4 – 20mA) is available.

Communication via RJ45 is also possible to control the analyzer and to down load measurement data from the memory.

Alarms

System fault: in case of system failure the alarm contact is triggered.

Threshold alarm (optional): relays for threshold alarm are available.

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Maintenance

Action	Daily	Weekly	Monthly	Quarterly	Yearly
Check for leakage and alarms	X				
Fill up reagents		(X)	X		
Check calibrations		(X)			
Fill up electrolyte (ISE) (if installed)		(X)	X		
Replace sensor of ISE or ISE (if installed)				(X)	X
Clean tubing (if necessary)		(X)	X		
Replace pump tubing (if necessary)				X	
Replace all tubing					X
Replace reference electrode (if installed)					X
Check photometer (if installed)			X		

Intervals and tasks may change due to application.

Sample pre-treatment

Since turbity does not effect potentiometric measurements filtration is only necessary to keep out large particles. Therefore we provide a simple automatic filtration unit for applications clogging my cause trouble.

The implemented automatic back flush system keeps the filterelement clean and ensures almost maintenance free operation.

The back flushing is either controlled by the analyser or by seperated controller.

All wetted parts are made of PVC and stainless steel.

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Specifications

Analytical method:		Potentiometry, photometry, conductivity
Range:		Application dependent
Meas. interval:		Continuous, T_{90}-time application dependent
Sample:	*Pressure:*	0 bar with sample pump. Higher pressures on demand.
	Flow rate:	Application dependent
	Temperature:	>0 - 50 °C (application dependant)
Measurement system:		Ion-selective electrode pH-electrode
		Redox-electrode
		Reference electrode
		T-probe (PT1000 Teflon-coated) (optional)
		Photometer
Alarms:	*Threshold*	potential free, NC/NO
	Fault	potential free, NC/NO
Status signal:		For remote start/stop (potential free, optional)
Outputs:		(0)4 – 20mA, max. 500 Ohms
Digital input:		Start/stop, others
Calibration/Validation:		Manual/automatic (optional)
Environmental conditions.:		Indoor mounting
	Rel. humidity:	5 – 95% (not condensing)
	Temperature:	10 – 50 °C
Housing:		Wall mounting, stainless steel and plastic
	Dimensions:	Width: ±400 mm x depth: ±270 mm x height: ±910 mm
	Weight:	Approx. 30 kg
Infrastructure:	*Mains:*	220/240 VAC, 50/60 Hz, 110/120 VAC
	Instrument air:	Dry and oil free ISA-S7.0.01-1996 (optional for air purge)
	Waste:	Atmospheric open sink

Errors and omissions accepted! Technical data are subject to change!

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