



# Catalyst Applications

The Definitive Solution for Catalytic Processes & Research

## CatalySys

From ESS Ltd

CatalySys from ESS represents the ultimate in Mass Spectrometry and vacuum technology.

Designed specifically for Catalyst monitoring applications, CatalySys offers the highest standards of performance and ease-of-use. Housed within a compact space saving cabinet, the unit can be positioned in very close proximity to the reactor / plant.

Control is by means of a LAN connection, allowing operation via the supplied PC or remotely via a network.

CatalySys features full safety interlocks ensuring that damage due to inadvertent operation is avoided.

### Features of CatalySys systems include:

- **Twin Capillary inlet (standard inlet length is 2m) arrangement, meaning that the user can monitor both sides of the Catalyst thus enabling efficiency to be calculated directly**
- **Full integration into PLC / control systems, allowing automatic control of gas feeds**
- **Automatic switchover of inlets, with user definable sample times on each line**
- **Data storage in individual files for each inlet, time and date stamped**
- **Automated operation possible**
- **Ultra-fast response time of 150mS, ensuring that all process events and catalyst breakthroughs are captured**
- **Real time monitoring of up to 64 gas species**
- **Direct injection of gases directly into the ion source**
- **Fully Quantitative analysis (with calibration gas)**
- **Extremely low detection levels**
- **Remote stop / start function**
- **Corrosive gases option**
- **Full process plant integration**



### ESS Ltd

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# CatalySys

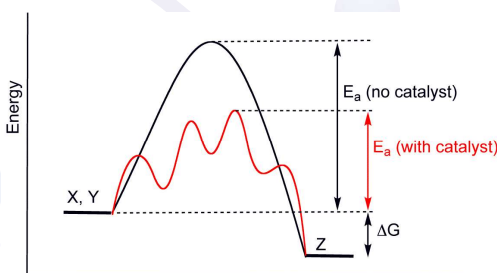
All CatalySys systems feature a 200 amu (300 optional) precision Mass Spectrometer with ultra gas tight ion source in a high throughput all metal analyser housing.

High vacuum is provided by means of an 80 l/s turbomolecular pump backed by a dry diaphragm pump and all-metal construction of the vacuum system ensures the utmost vacuum integrity and ultra low background levels.

## Operation and Control

CatalySys instruments can be linked to Catalyst reactors to provide two types of control, these being:-

- **Direct feedback, monitoring and control of the Gas phase composition**
- **Calibrated continuous record of the entire Gas phase**



Normally, CatalySys is connected to the reactor by means of the capillary inlets to the reactor port with a small bleed flow of gas (around 50 ml/min) supplied to atmosphere, past a T-piece containing the capillary inlet, and the instrument set up to run the reactor gases with time, with the software configured to record the data either as a percentage of the bulk gas or as individual intensities / concentrations. Outputs can be directly fed to the process control system to control the gas feeds into the reactor.

The result is that the gas phase composition of the Catalyst can be very closely controlled, thus helping to maximise the yield. If the second capillary inlet is positioned at the reactor outlet, it allows the user to calculate the catalyst efficiency, and permanent optimisation of the catalyst is achieved.

***With CatalySys the user is in full control of the entire process at all times.***

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