



HILASE

**HIGH SENSITIVITY MONITORING SYSTEM
FOR CONCENTRATION MEASUREMENTS
IN INDUSTRIAL GAS,
NATURAL GAS AND BIOGAS**



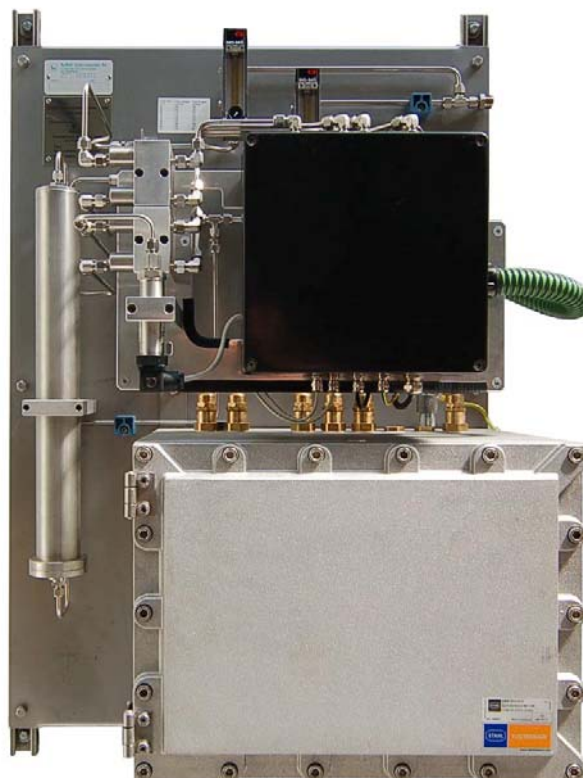
HILASE - QUALITY CONTROL INSTRUMENT

The **Hilase** is a reliable and virtually maintenance free Process Analyser for the measurement of H₂S, H₂O, CO₂, CH₄, C₂H₆, Methanol/Ethanol, COS, Ammonia, etc in a range from low ppm to high % levels.

Reliable H₂S, H₂O and CO₂ measurements are critical in many industries to control gas treatment, protect process equipment and pipelines and supply a good quality gas to your customers.

The Hilase is a big step forward as it offers a combination of features not available with any other technology. No moving parts, no costly parts subject to wear, full separation of photo acoustic measuring cell and electronics, heated cell option, fast 20 seconds response time, stable calibration, more than 90% self diagnostics, robust design, easy installation, a 6 months maintenance interval, ATEX zone 1 certification and >99,8% availability.

In contaminated gas streams the photo acoustic cell is far less sensitive to fouling than an optical detection method.



Typical Hilase applications

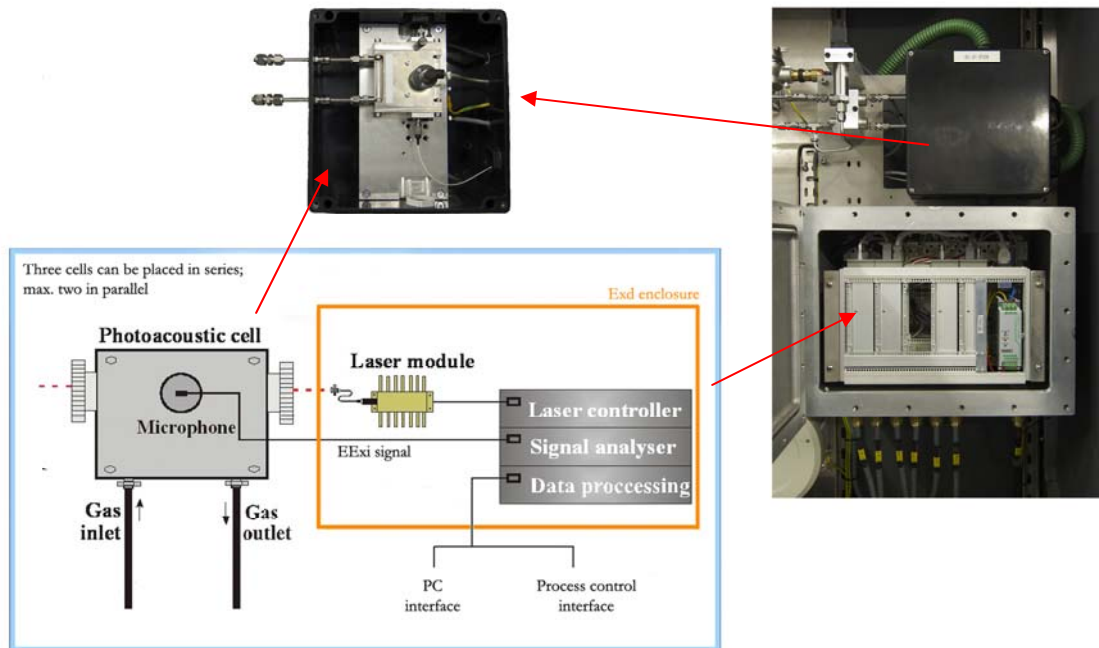
- H₂S monitoring before and after scavenger dosing
- H₂S in Crude Oil
- H₂S levels in storage tanks
- H₂S and H₂O in Natural Gases and LPG's
- H₂S and CO₂ in (amine) absorbers
- H₂S in production and test separators
- H₂S in Refinery fuel and flare gases
- H₂O and H₂S in recycle gas
- Methanol breakthrough in natural gas separators

Where you need to protect your and your customer's installation against H₂O, H₂S, CO₂, etc you can rely on the Hilase in combination with Hobr  Instruments' proven sampling system designs.

Technology

The analysis is based on photo acoustic technology, whereby the different compounds are excited by Tuneable Diode Laser (TDL) and detected by a microphone. The TDL wavelength is tuned to the absorption line of the measured component and its background.





This technology utilizes all the benefits of high resolution and thus very specific, virtually interference free excitation of TDL, combined with a robust photo acoustic detection principle.

By modulating the laser with a frequency equal to the resonance frequency of the acoustic cell, a sound signal is generated. This sound signal is measured by a sensitive microphone and provides a linear response over a wide concentration range.

As the Hilase does not use optical detection, the

analysis is insensitive to contamination or fouling.

The 6 months maintenance interval in combination with 1,5 hour warm-up time the analyser provides a high availability. The >90% self diagnostics results in improved reliability.

Multiple photo acoustic cells and/or dual lasers in a single analyser allow simultaneous analysis of different components (e.g. H₂S; H₂O; CO₂; CH₄ etc.) and multi-stream monitoring (e.g. before and after separators).

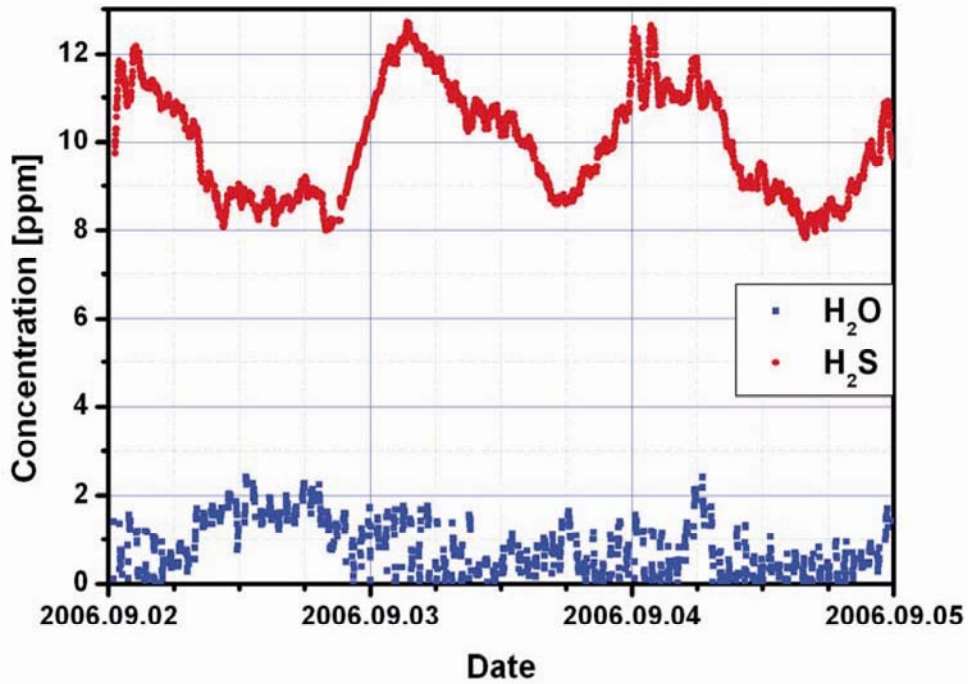


HSE aspects

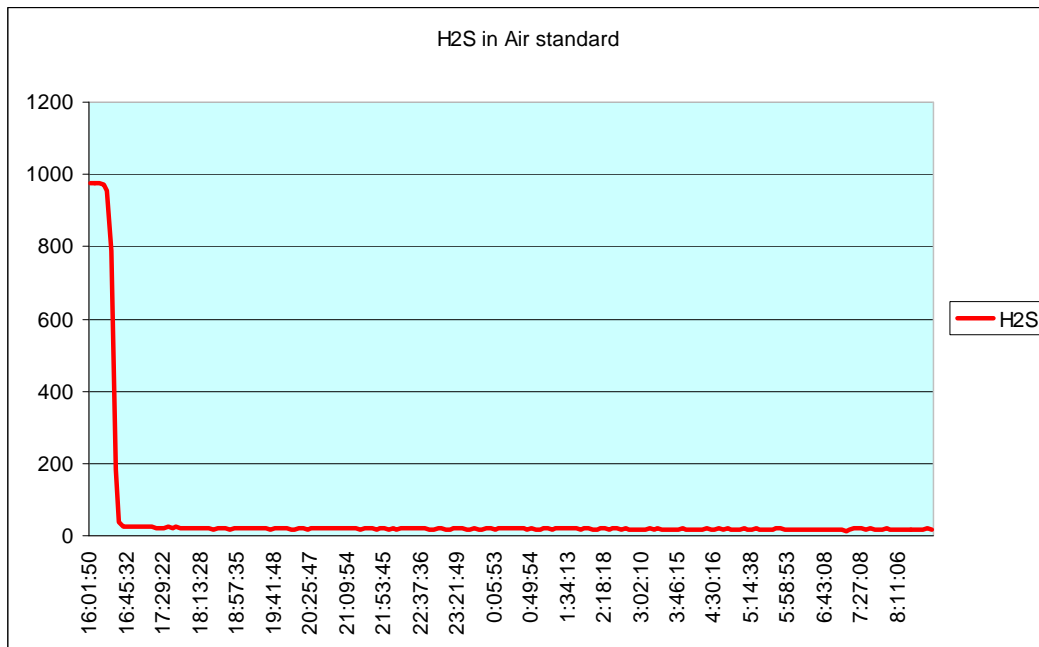
The low sample flow (0,1 - 0,5 l/min) and photo acoustic cell pressure (1,5 barg) allow venting to flare to avoid venting of greenhouse or toxic gases to the atmosphere.

The Hilase analyser is designed and proven to have the lowest possible costs of ownership. This is possible by not having moving parts; low installation costs; no other utilities then power; 6-12 months maintenance interval and >10 years laser lifetime.





Example: combined H₂S and H₂O measurement at a natural gas plant with the model Hilase



Example 2: output of Hilase on 960 ppm H₂S in air standard, before and after dilution to 19 ppm H₂S.





Operation, service and maintenance

This robust analyser is suitable for outdoor installation in a harsh industrial environment where minimal maintenance and minimal operator interventions are required.

The stable calibration factors require only a single point calibration verification every 6-12 months. A calibration verification for H₂S is performed on only one span gas that can be different from the gas to be measured (e.g. CO₂).

The analyser does not have moving parts nor require consumables. The photo acoustic cell is completely separated from the electronics; this means the unit does not have to be switched off during maintenance and a hot work permit is not required to access the intrinsic safe photo acoustic cell(s).

The photo acoustic cell can be heated-up to 80 °C, allowing wet gas analysis without cooling and/or separation.

Sampling systems for H₂O and H₂S analysis

H₂O and H₂S are reactive components often present in low ppm levels. The value of the analyser results only in a benefit when it is used with a well designed sample conditioning system. Hobr  Instruments has over 30 years experience in the design and supply of such systems. Our designs are application specific based on the gas composition and phase diagrams of the process fluids. Process Upset conditions will be considered in our designs.

Typical gas analysis systems can include:

- Flow Impact Probe for representative sampling, fast response time and minimum liquid carry over.
- Proprietary Multiphobic membrane filtration resulting in long maintenance interval and lowest level of liquid carry over.
- Diagnostics of critical functions, automatic system validation and/or calibration

For those applications we can turn your application challenges into a working solution.

Liquid Applications

The Hilase technology is suitable for gas phase measurements. For measurement in a liquid stream, a stripping system in combination with the Hilase analyzer is required. The design of a stripping system is application dependent. Stripping systems can be supplied for crude oil, glycol, water and others applications.





SPECIFICATIONS HILASE ANALYSER

MEASURING PRINCIPLE																			
Excitation	Tuneable Diode Laser (TDL)																		
Detection	Photo acoustic																		
ANALYTICAL PERFORMANCE																			
<u>Compound</u> ¹⁾	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;"><u>Measuring Range</u> ²⁾</th> <th style="text-align: center;"><u>Repeatability</u></th> </tr> <tr> <th style="text-align: center;">Min</th> <th style="text-align: center;">Max</th> <th></th> </tr> </thead> <tbody> <tr> <td>H₂S</td> <td style="text-align: center;">0,5 ppm</td> <td style="text-align: center;">100 %</td> </tr> <tr> <td>H₂O</td> <td style="text-align: center;">0,1 ppm</td> <td style="text-align: center;">50.000 ppm</td> </tr> <tr> <td>CH₄, C₂H₆, CO₂</td> <td style="text-align: center;">0,1%</td> <td style="text-align: center;">100 %</td> </tr> <tr> <td>Methanol, Ethanol, Ammonia</td> <td colspan="2" style="text-align: center;">Depends on application Consult Hobr� Instruments</td> </tr> </tbody> </table>	<u>Measuring Range</u> ²⁾		<u>Repeatability</u>	Min	Max		H ₂ S	0,5 ppm	100 %	H ₂ O	0,1 ppm	50.000 ppm	CH ₄ , C ₂ H ₆ , CO ₂	0,1%	100 %	Methanol, Ethanol, Ammonia	Depends on application Consult Hobr� Instruments	
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Response Time	20 seconds on step changes. Moving average over user adjustable period.																		
Number of Process Streams	Up to 5																		
Number of TDL's simultaneous	Up to 2																		
Calibration	On 1 span gas. Annual verification recommended. Calibration can be performed by customer analyser technician. Traceable Calibration Certificate Optional.																		
GAS HANDLING																			
Connections	6 mm Hy-lok.																		
Wetted materials	Stainless Steel 316. Other materials upon request.																		
Sample Cell Gas Pressure	1,5 barg maximum.																		
Gas Flow rate to photoacoustic cell	0,1 – 0,5 NI/min.																		
AREA CLASSIFICATION																			
Exd enclosure	ATEX II 2G IIB+H2 T3-T6 (T-rating application dependent).																		
COMMUNICATION																			
Analog outputs	4-20mA.																		
Digital Data Communications	PC Interface; RS 232 / 422 / 485; Modbus RS485 RTU; Common Fault Alarm. Others upon request.																		
AMBIENT CONDITIONS & UTILITIES																			
Ambient Temperature	- 20°C to + 60 °C.																		
Gas Temperature	Up to 60°C. Optional up to 80°C.																		
Power	100-240 VAC, 45-65Hz (1,9 A – 0,8 A).																		
Stabilisation time after cold start	90 minutes typically.																		
DIMENSIONS																			
Dimensions	60 x 70 x 40 cm (HxWxD).																		
Weight	± 100 kg.																		

¹⁾ For other compounds consult Hobr  Instruments

²⁾ For other ranges consult Hobr  Instruments

Note: above are approximate specifications. Exact specifications will vary depending on application, installation and operating environment. Hobr  Instruments bv reserves the right to change design or technical data without notice





FEATURES AND BENEFITS HILASE ANALYSER

FEATURES	BENEFITS
Repeatability (H ₂ S) +/- 0,25ppm or 1% of reading (whichever is greater), over multiple decades	Very wide dynamic range No new calibration required for range change
High resolution excitation by Tuneable Diode Laser (TDL)	Very selective and accurate analysis. Relative insensitive to interference by other components. By tuning the laser on/off the peak, continuous background correction is performed.
Multiple Flow Cells possible in 1 analyser	Simultaneous Multiple Stream analysis without stream switching. Space and cost saving.
Two (2) different lasers possible in 1 analyser.	Simultaneous Multiple Component analysis e.g. H ₂ S and CO ₂ analysis in natural gas. Space and cost saving.
Acoustic detection system.	In-sensitive to window fouling. Reduced maintenance and increased availability.
No moving parts.	Virtually maintenance free. Maintenance intervals > 6 months.
Horizontal mounted photo acoustic cell.	Less risk of contaminate deposit on windows in case of liquid carry-over.
Exd enclosure with extended ambient temp range (-20 to + 60C); suitable for zone 1.	Low installation cost. No need for purge gases.
Optional high temperature cell (80°C).	Suitable for direct analysis of wet gas.
Suitable to operate at 1.5 barg with low flow (0,1 – 0,5 l/min) through photo acoustic cell.	Venting to flare possible.
Virtually drift free technology.	Yearly calibration verification is sufficient.
Continuous matrix correction for low level (0-100 ppm H ₂ S) measurement by ZnO scrubber. No switching valves.	No risk of valve leakage. Reliable alarm during process upsets.
Fast start-up after cold start (1 ½ h).	High analyser availability.
Different outputs: PC interface; 4-20mA; Modbus (standard protocol, other protocols optional); Common Fault Alarm.	Very flexible, Simple interfacing.
Fast response time and user selectable moving average time.	Fast response on concentration changes (20 sec) and increased accuracies. Average override if last value exceed user selectable limit
Complete separation between sample wetted parts and electronics enclosure.	Elimination risk of damage in case of gas carry-over. No hot parts permit necessary.
> 90% self diagnostics.	High reliability.





Hobré Instruments Services

Hobré Instrument manufacturers a range of analysers and systems for quality measurements in the gas and oil production.

Natural gas systems include H₂S, CO₂, H₂S, Sulfur and full composition analysers. Other analyser technologies manufactured by Hobré Instruments BV are:

- Fast responding Wobbe / Heating value analysers
- Salt in Crude analysers
- Energy Dispersive XRF analysis for Sulphur and other elemental analysis from ppm to percent levels.

For applications in the oil and gas industry Hobré Instruments can offer complete solutions including technologies such as Process Gas Chromatographs, physical property analysers, oxygen, H₂S / SO₂ ratio oil in water, water in oil, etc. Please consult us for your specific requirements. We have a long experience in supplying complete analyser solutions worldwide.

Our Engineering and service team features a team of knowledgeable and experienced engineers that design and construct analysers, pre-conditioning systems, sample conditioning systems, sample recovery systems and complete analyser system packages for a broad range of gas and liquid applications.

We work in close relation and cooperation with the end user/contractor and analyser manufacturer to come to the best solution in compliance with the relevant standards and classifications. Our qualified and experienced service engineers support our customers around the world. With this group of well trained engineers we offer: corrective and preventive maintenance, start-ups, commissioning, site surveys, training, and Factory and Site Acceptance Testing for onshore or off shore analyser applications.

A strategic level of spare parts is kept to support products delivered and to keep delivery times for spare parts and consumables as short as possible to minimise down time of your analysers.

Hobre services

- Feasibility study
- Front-end engineering, design, construction, testing and supply of Analyser Packages
- Project management
- Documentation
- Commissioning, SAT, start-up, and training
- Maintenance and repair
- Spare parts supply

Contact us today for more information on our specialized sales and services

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