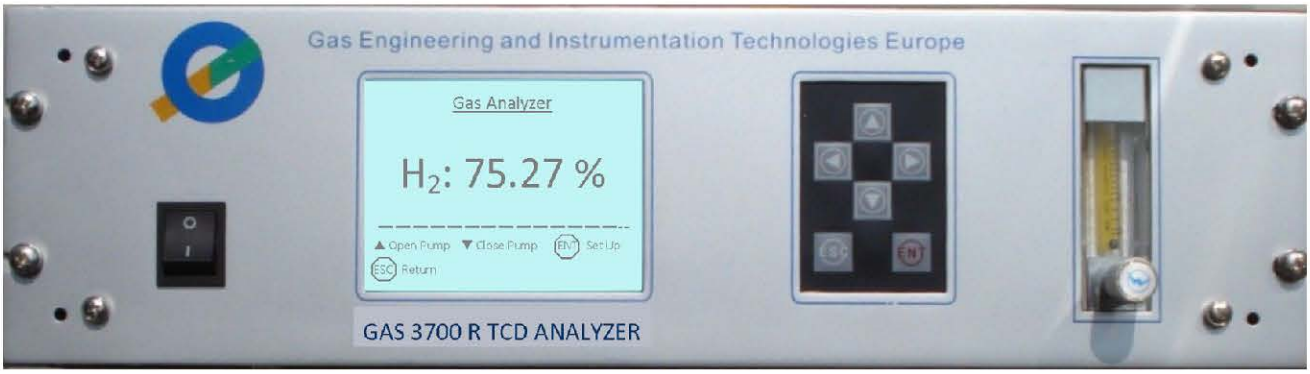
GAS 3700R TCD-H_2 Analyser

Analysis of % Hydrogen concentration in binary mixtures

GEIT
Gas Engineering and Instrumentation Technologies Europe

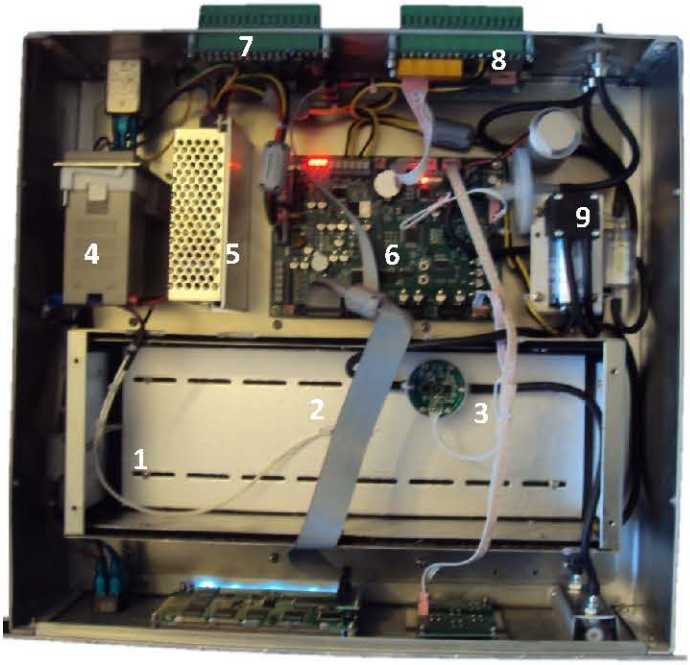


GAS 3700R TCD-H_2 is a specific gas analyser for measuring H_2 concentration in %volume in binary mixtures as H_2/air, H_2/N_2, etc.

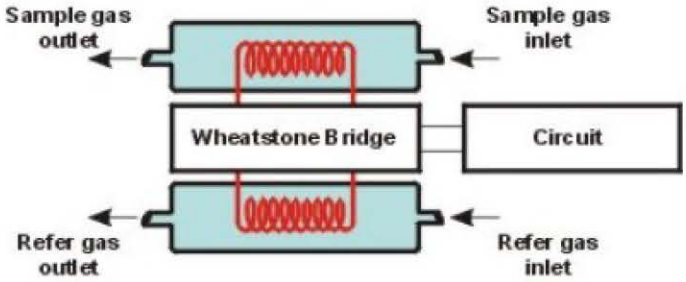
Typical applications are PSA Hydrogen Purity, Oil & Gas, Hydrogen Cooled Generators, Electrolyser Monitoring, Polymer Plant Hydrogen Feed, Air Separation Plants, Chemical industry (chlorine and caustic soda production), Fuel cells, Electric power grid transformers, Laboratories, etc.

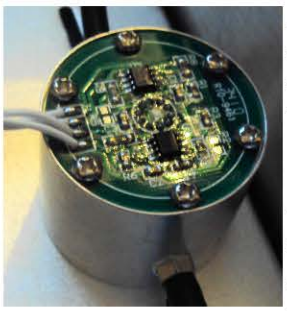
Key features

- Patented thermal conductivity detector (TCD) based on MEMS technology
- H_2 measure from 0-5% to 0-100%vol
- Reduced effects from gas flow variations
- TCD detector is integrated in a temperature regulated enclosure (+50°C)
- Fast response (T90 < 20 sec)
- Large LCD display (320 x 240 mm)
- Easy to use tactile keyboard interface
- Auto-zeroing function (on air or N_2)
- Optional Internal gas sampling pump
- 4-20mA & relays outputs
- RS232 COM port



TCD technology for H_2% vol measurment





TCD MEMS H_2% detector

A **thermal conductivity detector** operates by comparing the thermal conductivity of the gas sample with that of a reference gas (usually air, 1 at 100°C). A heated thermistor or platinum filament is mounted so that it is exposed to the gas sample, and another one acting as a reference is enclosed in a sealed compartment.

If the gas sample has a higher thermal conductivity than the reference, heat is lost from the exposed element and its temperature decreases, whilst if the thermal conductivity is lower than that of the reference the temperature of the exposed element increases. These temperature changes cause electrical resistance changes, which are measured by means of a bridge circuit.

Gases with thermal conductivities << 1 are difficult to measure partly because water vapour may cause an interference problem.

Gases with thermal conductivities close to 1 (NH_3, CO, NO, O_2, N_2) cannot be measured by a TCD.

Internal view GAS 3700R TCD-H_2

1. Heated enclosure (50°C) for TCD detector
2. PT100 for temperature control
3. TCD MEMS H_2% detector
4. Temperature controller
5. Power supply
6. Mainboard
7. 4-20mA output board
8. Relay outputs board
9. Zero air pump (or optional gas sampling pump)

Technical specifications

Measure	H_2 in percent volume in a binary gas mixture as H_2/Air, H_2/N_2, ... Optional calculation of N_2	
Gas analysis principle	Thermal Conductivity detector (TCD) based on MEMS technology	
No effect of gas flow variation	Patented TCD on which gas flow variation has negligible effects on H_2 measurement	
No effect of gas or ambient temperature variations	The TCD is integrated in an enclosure with temperature regulation (+50°C) providing increased stability and accuracy of the measures	
Measuring ranges	Lowest range	0-5% vol
	Highest range	0-100% vol [1]
	[1] *intermediary ranges available on request*	
Display	LCD (320 x 240), 4 digits, in % vol	
Display resolution	0.01%	
Precision	≤ ± 2% FS	
Repeatability	≤ 1% FS	
Span Drift	± 1% of Full Scale/day	
Zero drift	Auto-zeroing cycle (on air or N_2) at the end of the warm-up period Programmable zeroing cycle (on air or N_2), internal pump and solenoid valve Note : 4-20mA outputs are frozen during the programmable zeroing cycle + 120s	
Response time (T_D + T_{90})	≤ 20 s	
Warm up time	800 seconds (30 minutes to full specifications)	
Calibration	5 points factory calibration stored in the microprocessor of the gas analyzer 2 points (zero and span) user calibration	
Gas sampling	With external pump. Internal pump available in option, operation via external +12VDC voltage signal	
Sample Gas Conditions	Flow rate	Nominal 1L/min (0.7 to 1.2 L/min)
	Inlet pressure	nominal 50 mbar - 500 mbar maxi (free flowing gas without obstruction, pressure building will damage the analyser)
	Outlet pressure	Atmospheric pressure
	Temperature	Max. 50°C
	Quality	Free of dust, water vapor and oil traces
Operation conditions	T_{AMB}	0 to 50°C
	P_{AMB}	86 to 108kPa (860 to 1080 mbar)
	R_H	≤ 95%
Communication interface	RS232 with real time data transfer to external PC	
Analogue output signal	4-20 mA signal	
Digital output signals	2 gas alarm contacts (freely adjustable level)	
Mechanical	19''- 3U rack or desk type	
	Dimensions/ weight	L485 x W457 x H 132 mm - Weight : ± 12kg
Power supply	220 ±44 VAC - 50Hz ± 1 Hz	
Standard accessory	Main power cable	
Optional accessories	Internal gas sampling pump Real time data transfer software RS232 cable DB9-USB cable adapter	

Non contractual pictures and specifications - subject to change without prior notification - Issue -EN15v1

Gas Detection and Analysis
Industrial Processes Gas Monitoring
Landfill & Environmental Gas Monitoring

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