ARCHIGAS

LEADER IN HYDROGEN MEASUREMENT

TCD3000 Transmitter

TECHNICAL SPECIFICATIONS

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General application areas

- Oil & Gas • Petrochemicals
- Chemicals & Synthetics
- Gas chromatographs
- Air separators & pure gas production
- Detection of gas leakages
- Pharmacy • Food industry
- Metals, minerals, pulp and paper
- Power generation
- Environmental technology

Application examples

Hydrogen measurement in electrolysis	O_2 in H_2	Upper Explosion Limit (UEL)
Oxygen measurement in electrolysis	H_2 in O_2	Lower Explosion Limit (LEL), with high moisture content
H_2 contamination in electrolysis, fuel cells, and semiconductor industry	H_2	99 to 100 vol.%, H_2 Quality 4.0
Exhaust gas measurement in fuel cells	H_2 in Air	LEL monitoring with very high water content
H_2 injection into the natural gas network	H_2 in Natural Gas	0 to 100 vol.%, mixing control
Decomposition and synthesis of ammonia	H_2 in N_2 + NH_3	0 to 100 vol.%, process control
Turbogenerators in power generation	H_2 in air, H_2 in CO_2 (Ar), CO_2 (Ar) in air	Monitoring of UEL, draining and filling process
Pure gas production and incoming goods inspection	H_2, He, CH_4, O_2, N_2, CO_2, Ar	Identification of the quality of produced and delivered gases
Industrial applications	H_2 in N_2	e.g. 0 to 10 vol.%, systems for the production and monitoring of forming gas
Safety monitoring	H_2 in air	LEL, analysis of hydrogen dispersion in facilities and buildings

Advantages

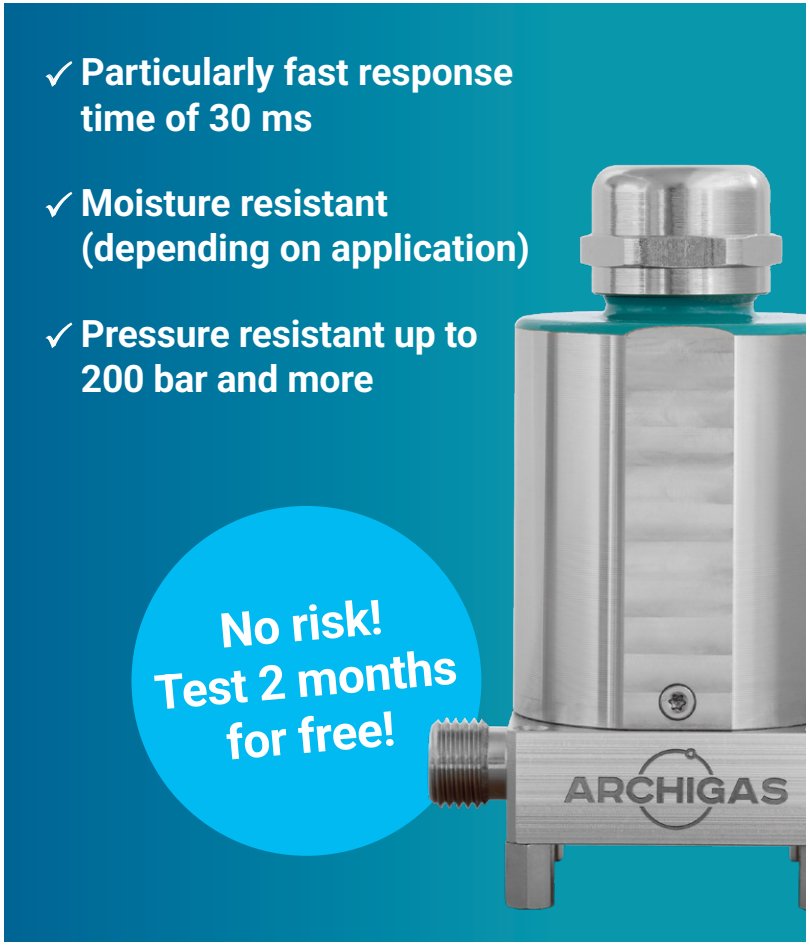
The compact and robust TCD3000 Transmitter is ideally suited for precise, fast, and sensitive measurement of (quasi-)binary gas mixtures. The measurement is based on the principle of thermal conductivity. This technology is ideal for measuring gases with significantly different thermal conductivities, such as H_2 and O_2.

- **Revolutionary precision in hydrogen concentration measurement:**
  Discover our gas measuring devices with **industry-leading response time of 30 ms** and **a measurement range from a few ppm to 100 vol.%,** specially developed for the new requirements of the hydrogen infrastructure in the energy sector and process industry.

- **Exceptional robustness for demanding environments:**
  The analyzer delivers precise measurements **up to a pressure of 200 bar** and beyond. In addition, depending on the application, it can **withstand condensate and water without damage.** This makes it ideal for electrolysers, fuel cells, and other hydrogen applications.

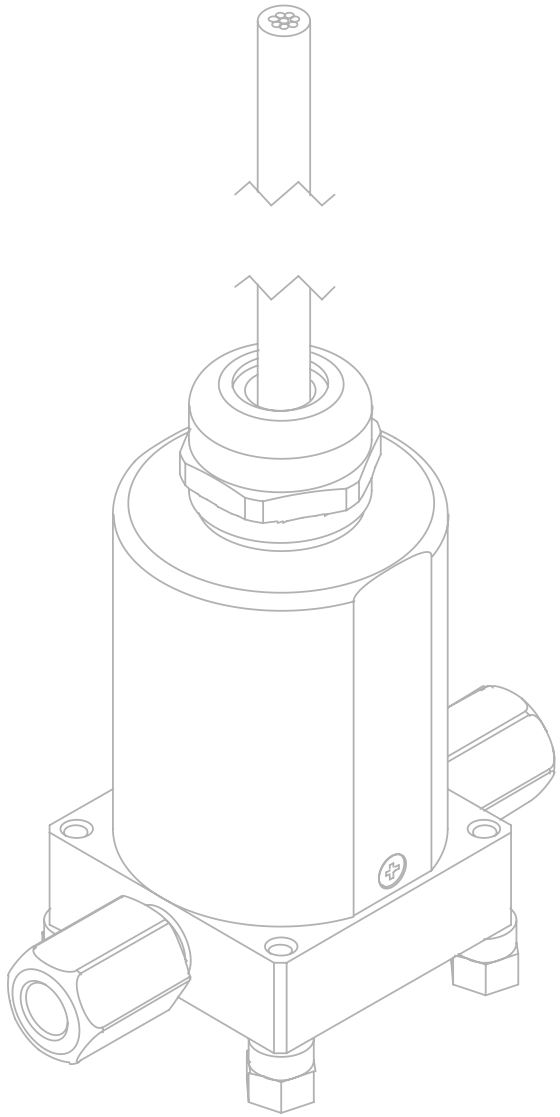
- **Maximum safety, minimal maintenance:**
  Increase your work safety with our fast and **reliable explosion level monitoring.** Our devices are a long-term investment with **a lifespan of up to 10 years.**

- **Adaptability meets economy:**
  Save costs and space with our versatile gas measuring devices that can measure a wide variety of gas mixtures **without additional sample preparation.** A cost-efficient solution that surpasses the competition in terms of price and performance.



Specifications 1/2

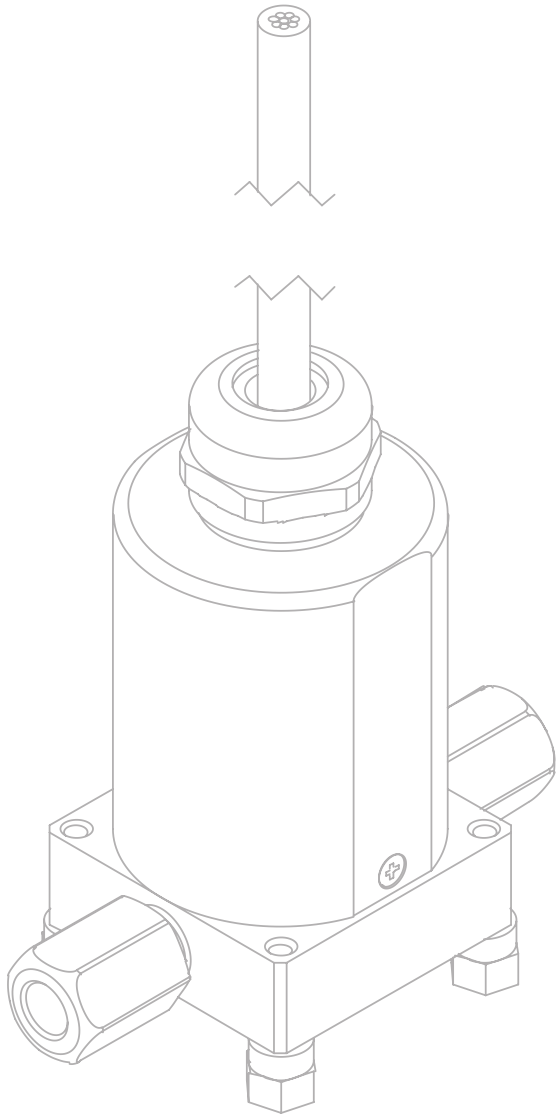
General technical data	
Installation position	Independent
Weight	430 g
Dimensions	H: 78 mm; L: 72 mm; W: 35 mm
Protection class	IP66 / IP68 according to EN 60529
Gas connection	6 mm
Electrical inputs and outputs	
Power supply	24 ±25 % VDC, < 5 W
Analogue output	4-20 mA potential-bound, RL ≤ 750 Ω
Serial interface	RS485, baud rate 38400, 8 data bits
Measuring ranges	
Smallest possible measuring span	0 to 0.5 vol.%
Largest possible measuring span	0 to 100 vol.%
Number of measuring ranges	10; freely parameterisable
Gas inlet conditions	
Sample gas pressure	0.9 to 200 bar (absolute)
Sample gas flow	0 to 120 l/h (higher flow rates on request)
Sample gas temperature	-40 to +90 °C / +125 °C
Sample gas humidity	up to 100 % RH
Time behaviour	
Warm-up time	< 1 min
Reaction time	≤ 30 ms
T90 time	< 1 s



Specifications 2/2

Measuring behaviour	
Noise	< 10 ppm
Detection limit	< 50 ppm
Measured value drift	< 100 ppm / week
Repeatability	< 100 ppm
Linearity deviation	< 1 % of the current measuring span
Influencing variables	
Ambient temperature	< 50 ppm / 10 K
Sample gas pressure at zero point	< 25 ppm / 10 hPa; from 1 MPa < 2 ppm / 10 hPa
Sample gas pressure for deflection gas	< 100 ppm / 10 hPa; from 1 MPa < 10 ppm / 10 hPa
Sample gas flow at zero point	< 25 ppm / 10 l/h
Sample gas flow rate with deflection gas	< 100 ppm / 10 l/h
Climatic conditions	
Storage and transport	-40 to +90 °C
Ambient temperature	-40 to +90 °C
Ambient humidity	up to 100 % RH
Parts in contact with sample gas	
Screw-in housing	Stainless steel 316L
Sintered metal filter	Stainless steel 316L
Sensor	Si, SixNy, potting compound, ceramics
Gasket	FKM, optional: FFKM or PTFE

All data refer to the measuring range 0.5 vol.% H_2 in N_2



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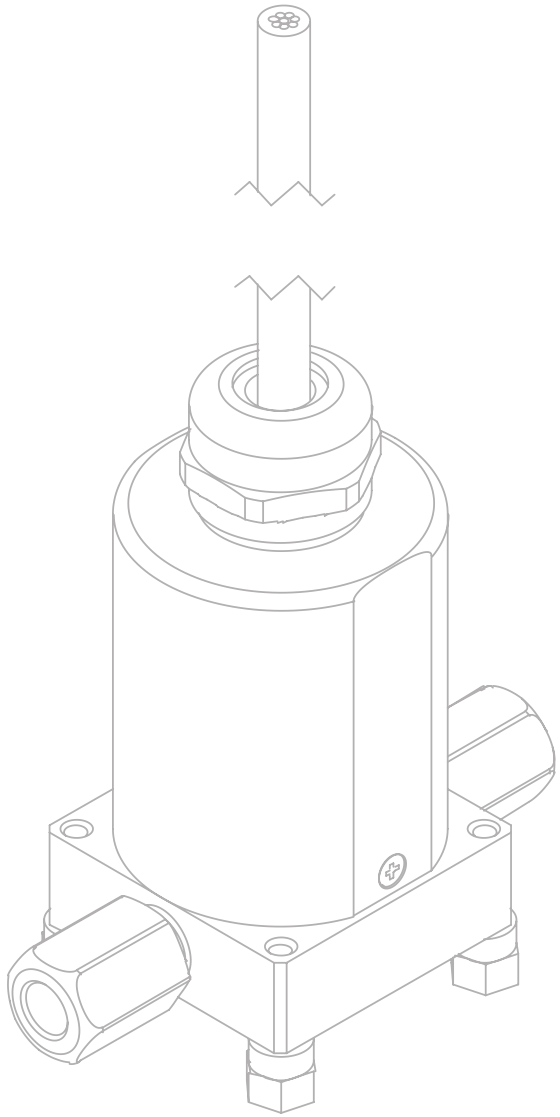
Most requested measurement components and ranges

Measuring gas	Carrier gas	Basis range	Smallest range
Hydrogen (H_2)	Oxygen (O_2)	0 to 100 vol.% *	0 to 0.5 vol.%
Oxygen (O_2)	Hydrogen (H_2)	0 to 100 vol.% *	0 to 1.0 vol.%
Hydrogen (H_2)	Nitrogen (N_2) or air	0 to 100 vol.%	0 to 0.5 vol.%
Nitrogen (N_2)	Hydrogen (H_2)	0 to 100 vol.%	0 to 2.0 vol.%
Hydrogen (H_2)	Argon (Ar)	0 to 100 vol.%	0 to 0.5 vol.%
Hydrogen (H_2)	Helium (He)	20 to 100 vol.%	–
Hydrogen (H_2)	Methane (CH_4)	0 to 100 vol.%	0 to 0.5 vol.%
Hydrogen (H_2)	Carbon dioxide (CO_2)	0 to 100 vol.%	0 to 0.5 vol.%
Helium (He)	Nitrogen (N_2) or air	0 to 100 vol.%	0 to 0.8 vol.%
Helium (He)	Argon (Ar)	0 to 100 vol.%	0 to 0.5 vol.%
Methane (CH_4)	Nitrogen (N_2) or air	0 to 100 vol.%	0 to 2.0 vol.%
Methane (CH_4)	Argon (Ar)	0 to 100 vol.%	0 to 1.5 vol.%
Oxygen (O_2)	Hydrogen (H_2)	0 to 100 vol.%	0 to 15.0 vol.%
Oxygen (O_2)	Argon (Ar)	0 to 100 vol.%	0 to 2.0 vol.%
Oxygen (O_2)	Nitrogen (N_2)	0 to 100 vol.%	0 to 3.0 vol.%
Nitrogen (N_2)	Argon (Ar)	0 to 100 vol.%	0 to 3.0 vol.%
Carbon dioxide (CO_2)	Nitrogen (N_2) or air	0 to 100 vol.%	0 to 3.0 vol.%
Carbon dioxide (CO_2)	Argon (Ar)	0 to 60 vol.%	0 to 10.0 vol.%
Argon (Ar)	Carbon dioxide (CO_2)	40 to 100 vol.%	–
Argon (Ar)	Oxygen (O_2)	0 to 100 vol.%	0 to 3.0 vol.%



TCD technology also allows to perform the measurements of the following industrial gases: SF_6, NO_2, Neon, Krypton, Xenon, Deuterium etc.
** correspondent safety measures must be taken by the client in the application with explosive gas mixtures*

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