



LEADER IN HYDROGEN MEASUREMENT

# TCD3000 SiA TCD3000 Si

TECHNICAL SPECIFICATIONS



## General application areas



- Oil & gas • Petrochemicals
- Chemicals and plastics
- Gas chromatographs
- Air separators & pure gas production
- Gas leak detection
- Pharmaceutical & food industry
- Metals, minerals, pulp & paper industry
- Power generation
- Environmental technology

## Application examples

Hydrogen measurement in electrolysis	O <sub>2</sub> in H <sub>2</sub>	Upper Explosion Limit (UEL)
Oxygen measurement in electrolysis	H <sub>2</sub> in O <sub>2</sub>	Lower Explosion Limit (LEL), with high moisture content
H <sub>2</sub> contamination in electrolysis, fuel cells, and semiconductor industry	H <sub>2</sub>	99 to 100 vol.%, H <sub>2</sub> Quality 4.0
Exhaust gas measurement in fuel cells	H <sub>2</sub> in Air	LEL monitoring with very high water content
H <sub>2</sub> injection into the natural gas network	H <sub>2</sub> in Natural Gas	0 to 100 vol.%, mixing control
Decomposition and synthesis of ammonia	H <sub>2</sub> in N <sub>2</sub> + NH <sub>3</sub>	0 to 100 vol.%, process control
Turbogenerators in power generation	H <sub>2</sub> in air, H <sub>2</sub> in CO <sub>2</sub> (Ar), CO <sub>2</sub> (Ar) in air	Monitoring of UEL, draining and filling process
Pure gas production and incoming goods inspection	H <sub>2</sub> , He, CH <sub>4</sub> , O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , Ar	Identification of the quality of produced and delivered gases
Industrial applications	H <sub>2</sub> in N <sub>2</sub>	e.g. 0 to 10 vol.%, systems for the production and monitoring of forming gas
Safety monitoring	H <sub>2</sub> in air	LEL, analysis of hydrogen dispersion in facilities and buildings

Archigas' measurement method is based on the principle of thermal conductivity (TCD = Thermal Conductivity Detector). This technology is ideal for measuring gases with widely differing thermal conductivities, such as H<sub>2</sub> and O<sub>2</sub>.

### TCD3000 SiA – H<sub>2</sub> gas analyzer with ATEX certification

The **TCD3000 SiA** model is designed for hydrogen detection in areas that require **ATEX certification**. The compact and robust gas analyzer with the specifications **II 2 G Ex db IIC T4/T3 Gb, -40°C < Ta < +90°C / 125°C for ATEX ZONE 1** is ideal for the precise, fast, and sensitive measurement of quasi-binary gas mixtures.

### TCD3000 Si – H<sub>2</sub> gas analyzer

The **TCD3000 Si** variant is suitable for hydrogen detection in **non-hazardous areas**. The compact and robust gas analyzer is ideal for precise, fast, and sensitive measurement of quasi-binary gas mixtures.



## Advantages

The compact and robust screw-in devices are predestined for the precise, fast, and sensitive measurement of (quasi-)binary gas mixtures. Detection is based on the principle of thermal conductivity. This technology is ideal for measuring gases with widely differing thermal conductivities, such as H<sub>2</sub> and O<sub>2</sub>.

- **High precision and speed:**

The solutions feature an **industry-leading response time of 30 ms** and a **measuring range from a few ppm to 100 vol.%,** specially developed for the new requirements of the hydrogen infrastructure in the energy and process industries.

- **Exceptional robustness for demanding environments:**

The analyzers deliver precise measurements **up to a pressure of 200 bar** and more. In addition, depending on the application, they can **withstand condensate and water without damage.** This makes them ideal for electrolyzers, fuel cells, and other hydrogen applications.

- **Maximum safety, minimal maintenance:**

With **fast and reliable explosion level monitoring,** the devices significantly increase workplace safety. They are a long-term investment with an expected **service life of up to 10 years.**

- **Adaptability meets cost-effectiveness:**

The extremely compact screw-in devices **save space and costs.** Thanks to them, the most diverse gas mixtures can be **measured without additional sample preparation** – a highly efficient solution that outperforms the competition in terms of performance and price.

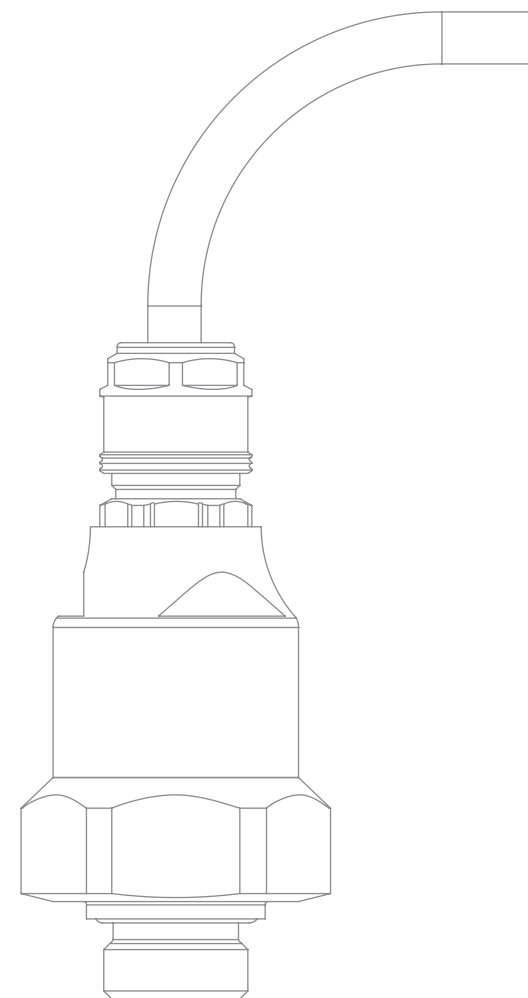
- ✓ **Particularly fast response time of 30 ms**
- ✓ **Moisture resistant (depending on application)**
- ✓ **Pressure resistant up to 200 bar and more**

**No risk!  
2 months  
free trial!**



## Specifications 1/2

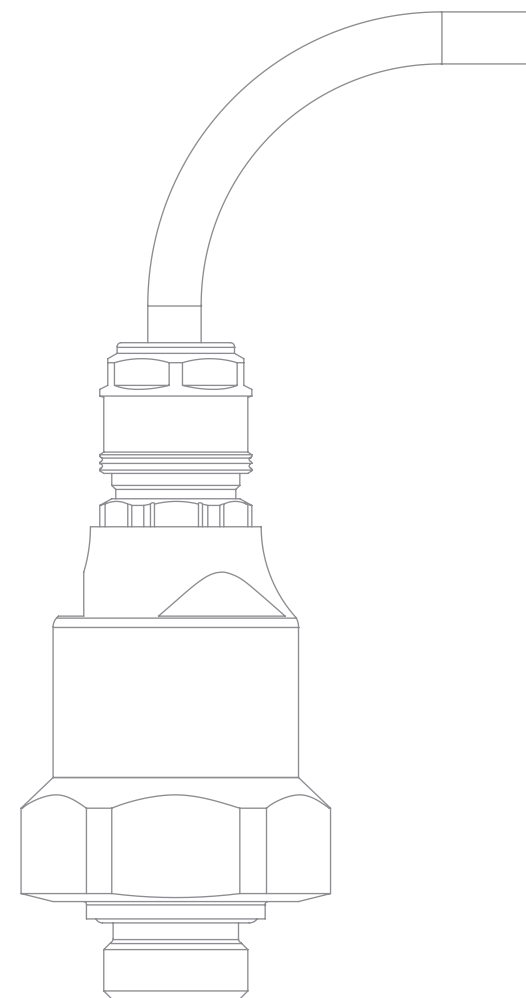
General technical data	
<b>SiA</b> Dimensions with connectors	H: 96 mm; Ø: 45 mm
<b>SiA</b> Weight	740 g
<b>Si</b> Dimensions with connectors	H: 91 mm; Ø: 45 mm
<b>Si</b> Weight	440 g
Protection class	IP66 / IP68 according to EN 60529
Installation position	independent
Gas connection	G 1/2" or NPT 1/2"
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 10 m/s (higher flow rates on request)
Sample gas temperature	-40 to +90 °C / +125 °C
Sample gas humidity	up to 100 % RH





## Specifications 2/2

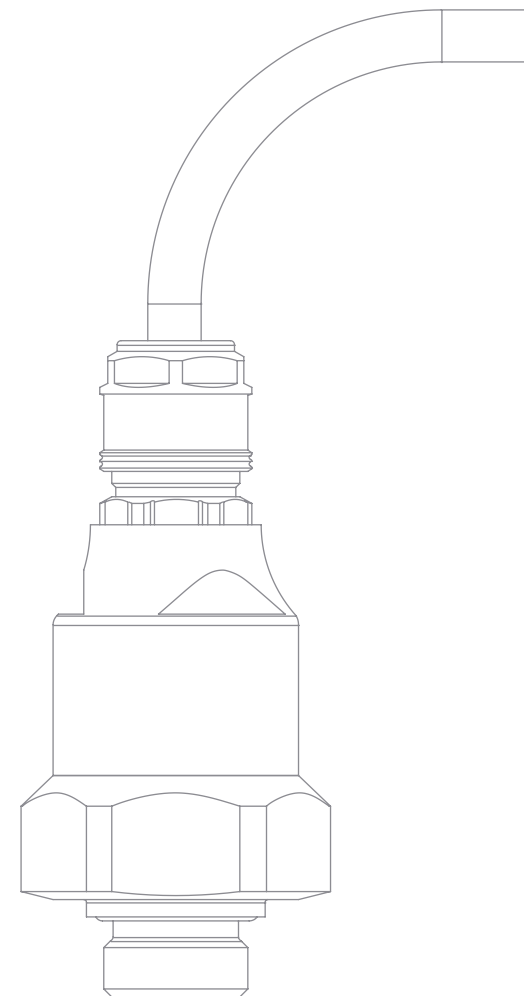
Time behaviour	
Warm-up time	< 1 min
Reaction time	≤ 30 ms
T90 time	< 1 s
Measuring behaviour	
Noise	< 10 ppm
Detection limit	< 50 ppm
Measured value drift	< 100 ppm / week
Repeatability	< 100 ppm
Linearity deviation	< 1 % of the current measuring span
Influencing variables	
Ambient temperature	< 50 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<sub>2</sub> in N<sub>2</sub>*

## Most requested measurement components and ranges

Measuring gas	Carrier gas	Basis range	Smallest range
Hydrogen (H <sub>2</sub> )	Oxygen (O <sub>2</sub> )	0 to 100 vol.% *	0 to 0.5 vol.%
Oxygen (O <sub>2</sub> )	Hydrogen (H <sub>2</sub> )	0 to 100 vol.% *	0 to 1.0 vol.%
Hydrogen (H <sub>2</sub> )	Nitrogen (N <sub>2</sub> ) or air	0 to 100 vol.%	0 to 0.5 vol.%
Nitrogen (N <sub>2</sub> )	Hydrogen (H <sub>2</sub> )	0 to 100 vol.%	0 to 2.0 vol.%
Hydrogen (H <sub>2</sub> )	Argon (Ar)	0 to 100 vol.%	0 to 0.5 vol.%
Hydrogen (H <sub>2</sub> )	Helium (He)	20 to 100 vol.%	–
Hydrogen (H <sub>2</sub> )	Methane (CH <sub>4</sub> )	0 to 100 vol.%	0 to 0.5 vol.%
Hydrogen (H <sub>2</sub> )	Carbon dioxide (CO <sub>2</sub> )	0 to 100 vol.%	0 to 0.5 vol.%
Helium (He)	Nitrogen (N <sub>2</sub> ) 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 <sub>4</sub> )	Nitrogen (N <sub>2</sub> ) or air	0 to 100 vol.%	0 to 2.0 vol.%
Methane (CH <sub>4</sub> )	Argon (Ar)	0 to 100 vol.%	0 to 1.5 vol.%
Oxygen (O <sub>2</sub> )	Hydrogen (H <sub>2</sub> )	0 to 100 vol.%	0 to 15.0 vol.%
Oxygen (O <sub>2</sub> )	Argon (Ar)	0 to 100 vol.%	0 to 2.0 vol.%
Oxygen (O <sub>2</sub> )	Nitrogen (N <sub>2</sub> )	0 to 100 vol.%	0 to 3.0 vol.%
Nitrogen (N <sub>2</sub> )	Argon (Ar)	0 to 100 vol.%	0 to 3.0 vol.%
Carbon dioxide (CO <sub>2</sub> )	Nitrogen (N <sub>2</sub> ) or air	0 to 100 vol.%	0 to 3.0 vol.%
Carbon dioxide (CO <sub>2</sub> )	Argon (Ar)	0 to 60 vol.%	0 to 10.0 vol.%
Argon (Ar)	Carbon dioxide (CO <sub>2</sub> )	40 to 100 vol.%	–
Argon (Ar)	Oxygen (O <sub>2</sub> )	0 to 100 vol.%	0 to 3.0 vol.%



TCD technology also allows to perform the measurements of the following industrial gases: SF<sub>6</sub>, NO<sub>2</sub>, 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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