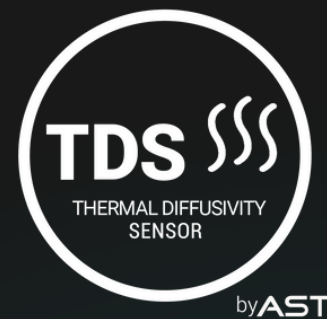
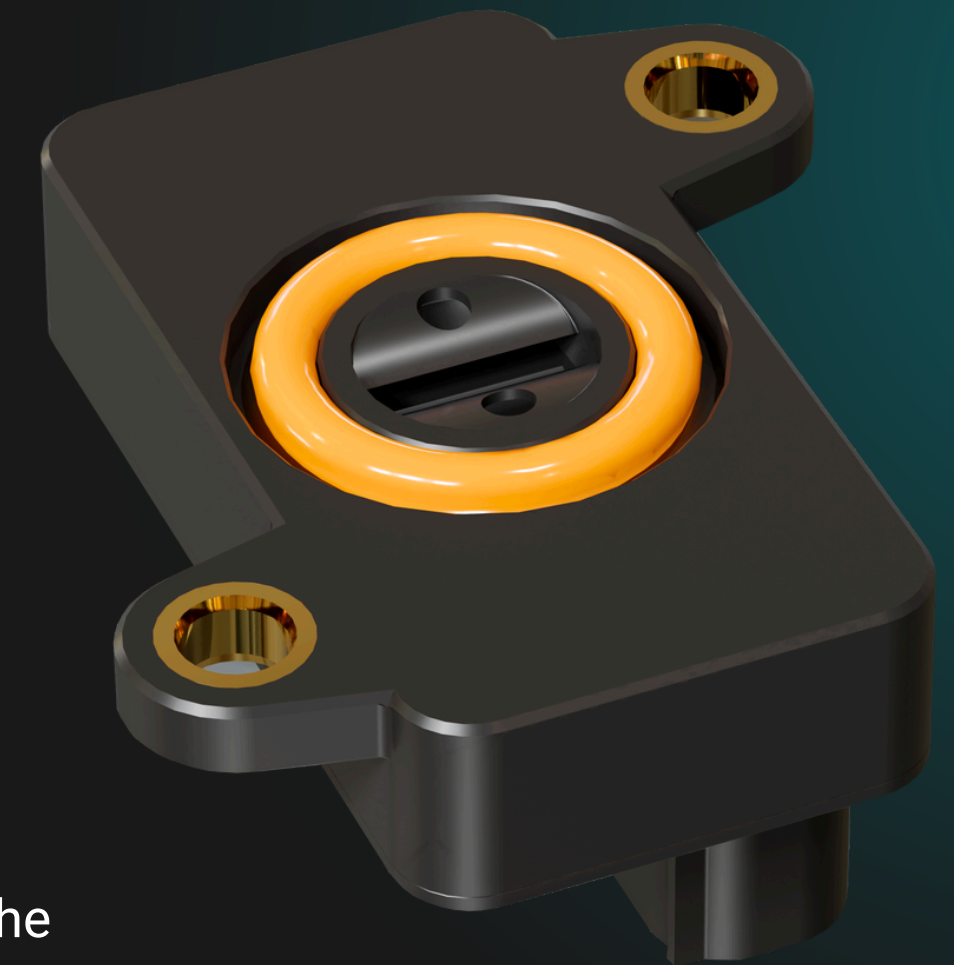




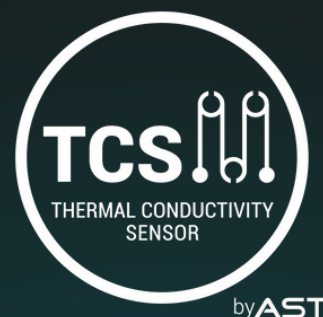
Hydrogen Concentration Sensor

SENSORS FOR MEASURING THE CONCENTRATION OF HYDROGEN IN AMBIENT AIR AND INSIDE FUEL-CELL SYSTEMS

- Robust measurement principle
- Chip technology enables compliance with functional safety requirements
- Long term stability without need for recalibration
- Low cross sensitivity to other gases
- Fast response time
- Customized housing geometry and data interfaces



The thermal diffusivity describes how quickly a temperature change spreads in a substance. This method is used with our hydrogen sensor to determine the hydrogen content in the surrounding environment. As hydrogen has a significantly higher thermal diffusivity, this measuring principle is predestined for this application.



For mutual verification, the thermal conductivity technology can also be applied. The TCS method, developed and patented by AST, determines the thermal conductivity of liquid and gas mixtures, allowing it to specify their composition.



Where to apply?

Measurement of hydrogen concentration in ambient air as leak detection or measurement of hydrogen concentrations inside the fuel cell for control purposes (e.g. purge process).

Anode Sensor: (0-100% hydrogen content)

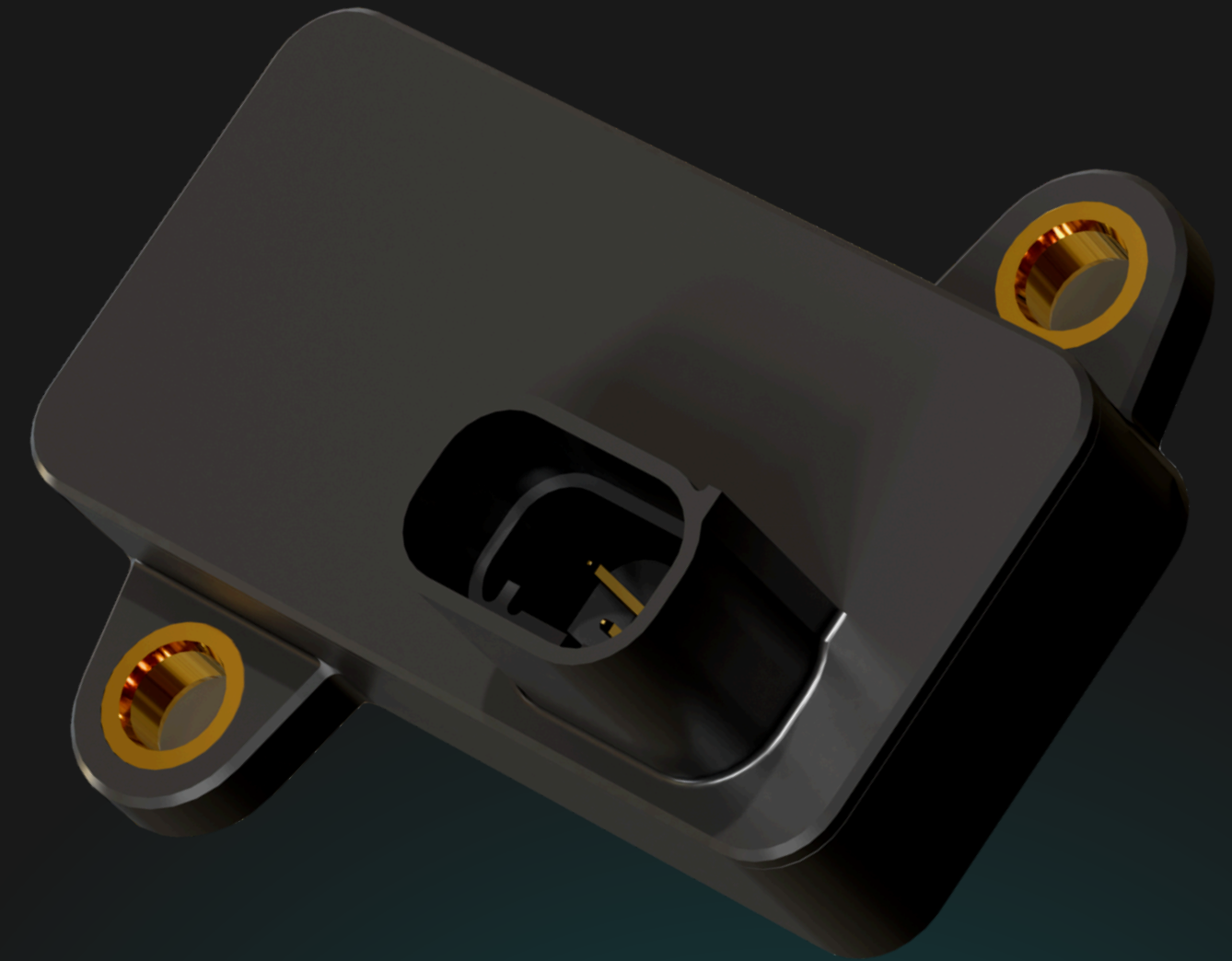
This sensor is used to determine a necessary purging process in the recirculation loop of the fuel cell.

Exhaust Sensor: (0-10% hydrogen content)

To determine the efficiency of hydrogen permeation within the fuel cell system, this sensor is placed in the exhaust system of the fuel cell.

Leak Sensor (0-5% hydrogen content)

The sensor can be placed for maximum safety in potential leakage points of the system (e.g. everywhere where an accumulation of hydrogen is possible).





Technical Extract:

Variants	Leak Sensor	Exhaust Sensor	Anode Sensor
Measurement range	0 - 5%	0 - 10%	0 - 100%
Measurement accuracy (lifetime)	± 0.1vol-% of H2 in air	± 0.1vol-% of H2 in air	± 1.5 vol-% of H2 in air
Response Time	< 1000 ms		
Operating Temperature	-40°C to +105°C		
Medium composition	Ambient Air, Hydrogen, Humidity	Ambient Air, Hydrogen, Humidity	N2 and H2, H2O (de-ionized pH4 water)
Compensated environmental conditions	Temperature, Humidity, Pressure		
Possible Iso 26262 safety Level	ASIL B	ASIL B	
Possible interfaces	CAN, LIN, SENT and more		



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AST is specialized in sensors and controls for high-currents, liquids and gases.

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