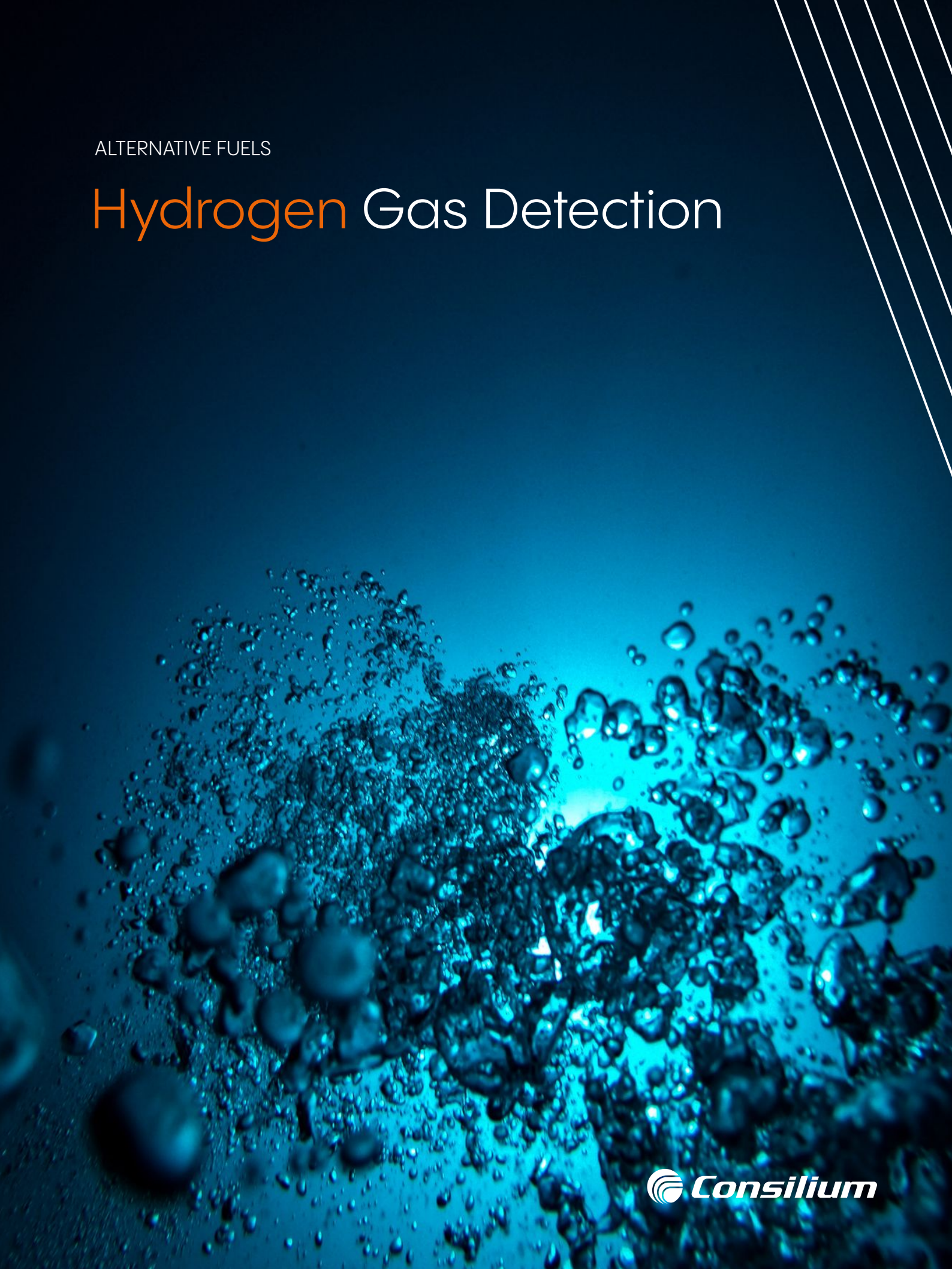
ALTERNATIVE FUELS

Hydrogen Gas Detection



Consilium

Hydrogen gas detection is crucial across various industries, including agriculture, food processing, chemical manufacturing, water treatment, pulp and paper, textiles, HVAC, livestock farming, and research laboratories. Hydrogen is also used in energy applications, particularly as a clean and sustainable fuel:

- Energy Production: Hydrogen can be used to generate electricity and heat, often in fuel cells, providing a green alternative to fossil fuels.
- Transportation: Hydrogen fuel cells power vehicles, offering zero-emission mobility.
- Energy Storage: Hydrogen can store excess energy, helping balance renewable energy sources.

Hydrogen is versatile, but it poses unique challenges

- Flammability: Hydrogen easily catches fire and forms explosive mixtures with air, making it highly combustible. Once ignited it burns with a pale blue, almost invisible flame.
- Lighter than Air: Hydrogen is lighter than air, so leaked gas rises and accumulates at the top of enclosed spaces, increasing explosion risks.
- Odorless: Hydrogen has no distinct odor, making it impossible to detect by smell.
- Health Risks: Hydrogen is not toxic but is a simple asphyxiant by the displacement of oxygen in the air. Under prolonged exposure to fire or intense heat the containers may rupture violently and rocket.
- Ensuring safe hydrogen use, coupled with effective detection systems, is crucial for both industrial and energy applications to harness its benefits while minimizing risks.

Hydrogen
Gas Detection Installation

Due to hydrogen's light nature, detectors must be mounted at elevated positions close to areas with potential hydrogen exposure, including storage zones, pipelines, and production facilities. Place detectors strategically in locations where hydrogen may accumulate, particularly in confined spaces or in proximity to potential ignition sources.

Molecular formula:	H_2
CAS number:	1333-74-0
Flash point:	Not applicable (Hydrogen is a gas at standard conditions and does not have a flash point)
Density kg/m^3:	0.08988 kg/m^3 (at 0°C and 1 atm)
UEL:	75.6% by volume in air (at 20°C)
LEL:	4% by volume in air (at 20°C)
TWA (EH40/2005):	1000 ppm (average time-weighted exposure limit)
STEL (EH40/2005):	Not established
Low alarm ppm:	Typically set at 10,000 ppm (1% LEL)
High alarm ppm:	Typically set at 20,000 ppm (2% LEL)

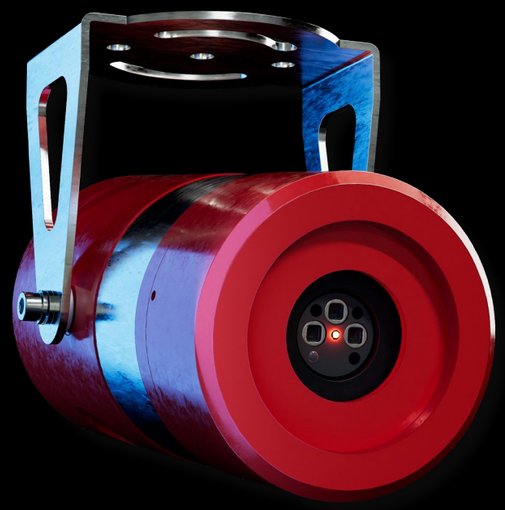
* Guidance, rules and regulations need to be checked.

Hydrogen Gas Detection - Type of Detectors

ST650 MPS

The latest innovation in gas detection which makes re-calibration, unwanted alarms and sensor poisoning a thing of the past. Available for the building and industrial market; the sensor accurately measures over 14 gases at the same time, without the need for corrections. This makes for an incredibly safe, stable and accurate detector that saves lives, resources and property.





FDS303H

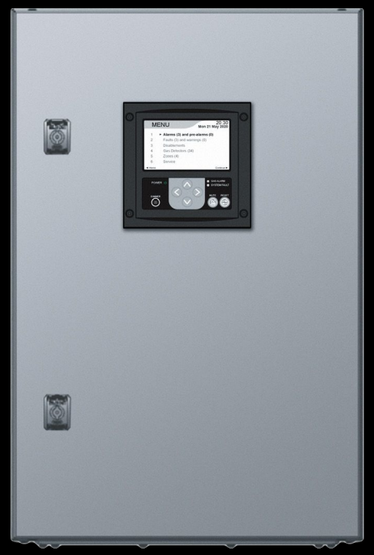
The Micropack FDS303H is an explosion-proof multi-spectrum IR flame detector. The device delivers superior performance, responding to hydrocarbon liquid fuel and gas fires at long distances. FDS303H is a reliable high performance IR3 hydrogen flame detector that will detect hydrogen flames very quickly. It is easy to install and maintain.

Hydrogen Gas Detection Systems

CGS500 Sequential gas sampling system* that automatically detects explosive and toxic gases. Meets IMO/SOLAS requirements and classification rules and can detect up to 64 sampling points. Perfect selection for detection in cofferdams around the fuel tanks.

** Available for marine applications only*



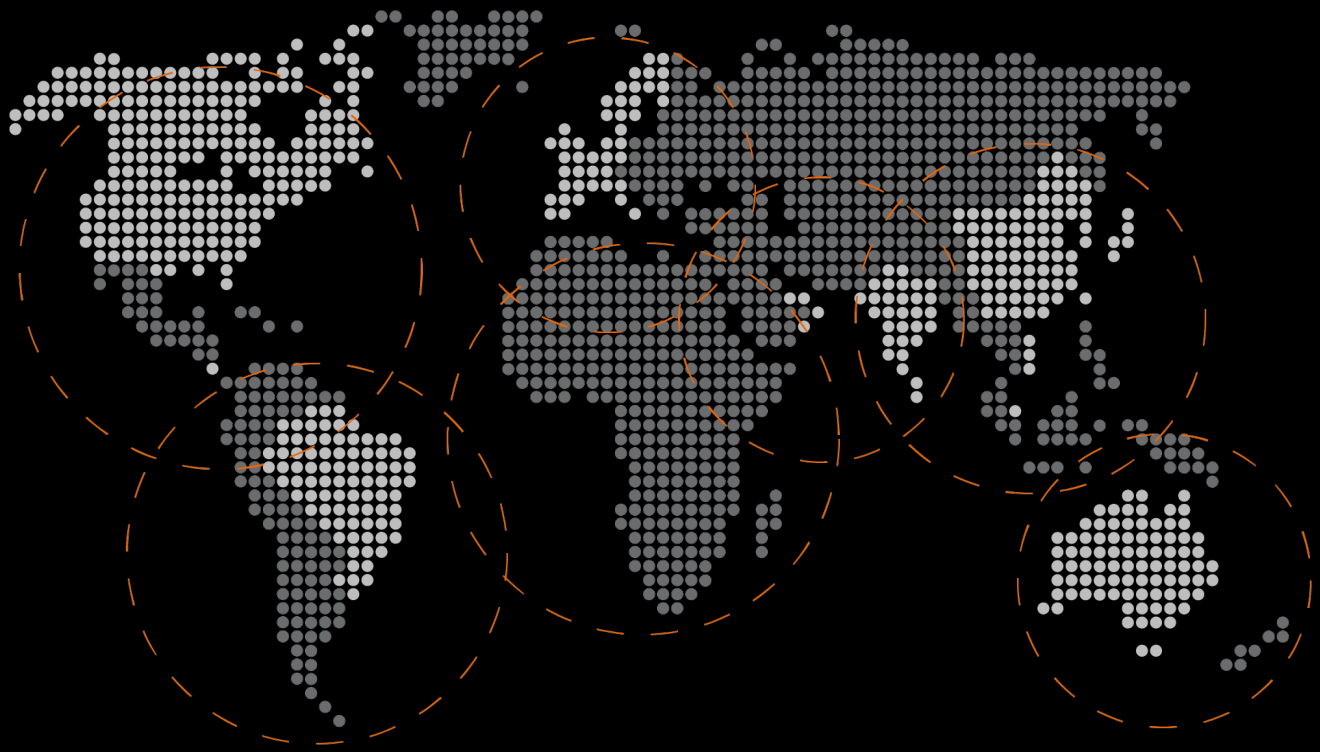


The CGD50/500 gas detection system is a state-of-the-art, control and supervision system designed to meet marine and industrial requirements. It consists of different modules and software together with a number of Gas detectors. The modules from the CCP Platform are used to build supervision systems and the software determines how the system will react in case of a gas indication from gas detectors or from an input that can generate alarms. The software continually supervises the system and will alert in case of any malfunction.

Our products are approved in accordance with ATEX, IECEx, cCSAus (incl UL & FM) and have most marine approvals (IMO/ SOLAS).

Global support with local expertise

Consilium offers fast and accessible support no matter where you are in the world. Nothing beats local expertise in your language. With a global service network and a strong local presence, we ensure accessibility wherever you operate.



As much as we are proud of our success, our commitment is to ensure safety. We have pledged to protect the lives of mothers and fathers, sisters and brothers, colleagues and friends. Our work never ends. That is why we keep innovating.

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