

# Hydrogen

H<sub>2</sub>



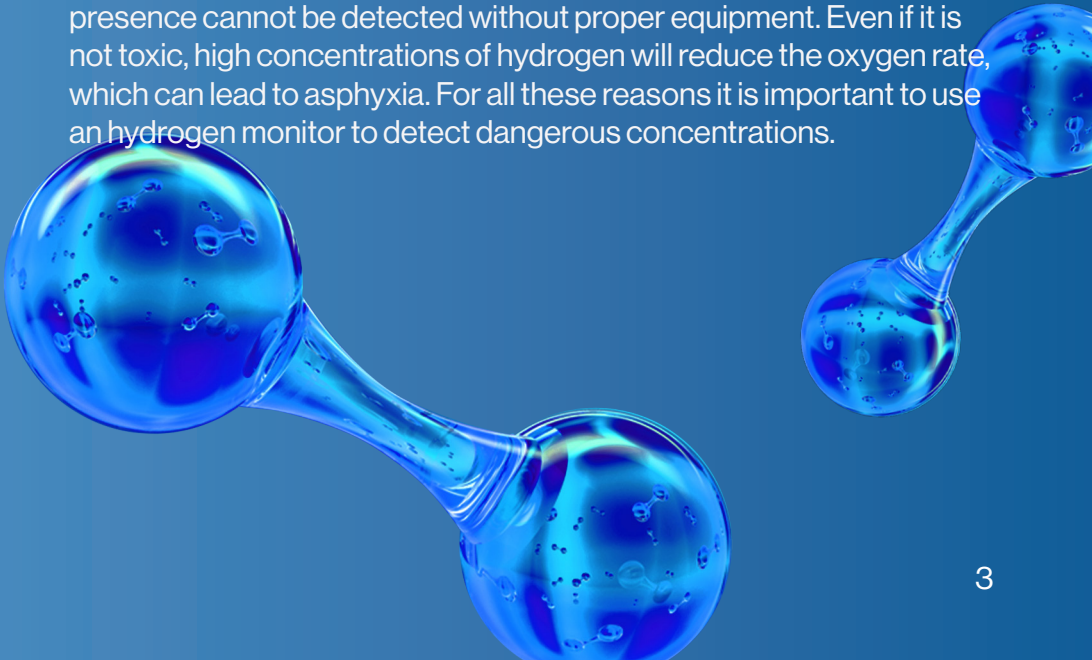
we watch gas  
where you can't

## Introduction

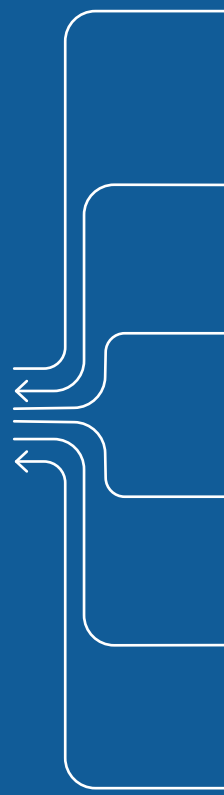
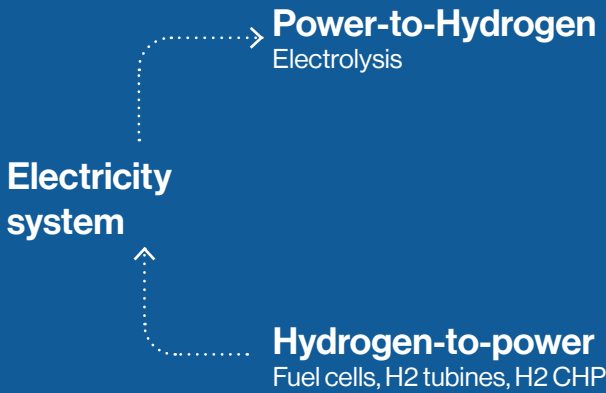
Industrially produced by reforming hydrocarbons – natural gas steam reforming – hydrogen ( $H_2$ ) – also called dihydrogen – is mainly used to remove sulphur from petroleum fuels and to produce ammonia. It is also considered as the fuel of the future (fuel cells). It is primarily released while charging batteries or during welding.

## Hydrogen gas Hazards

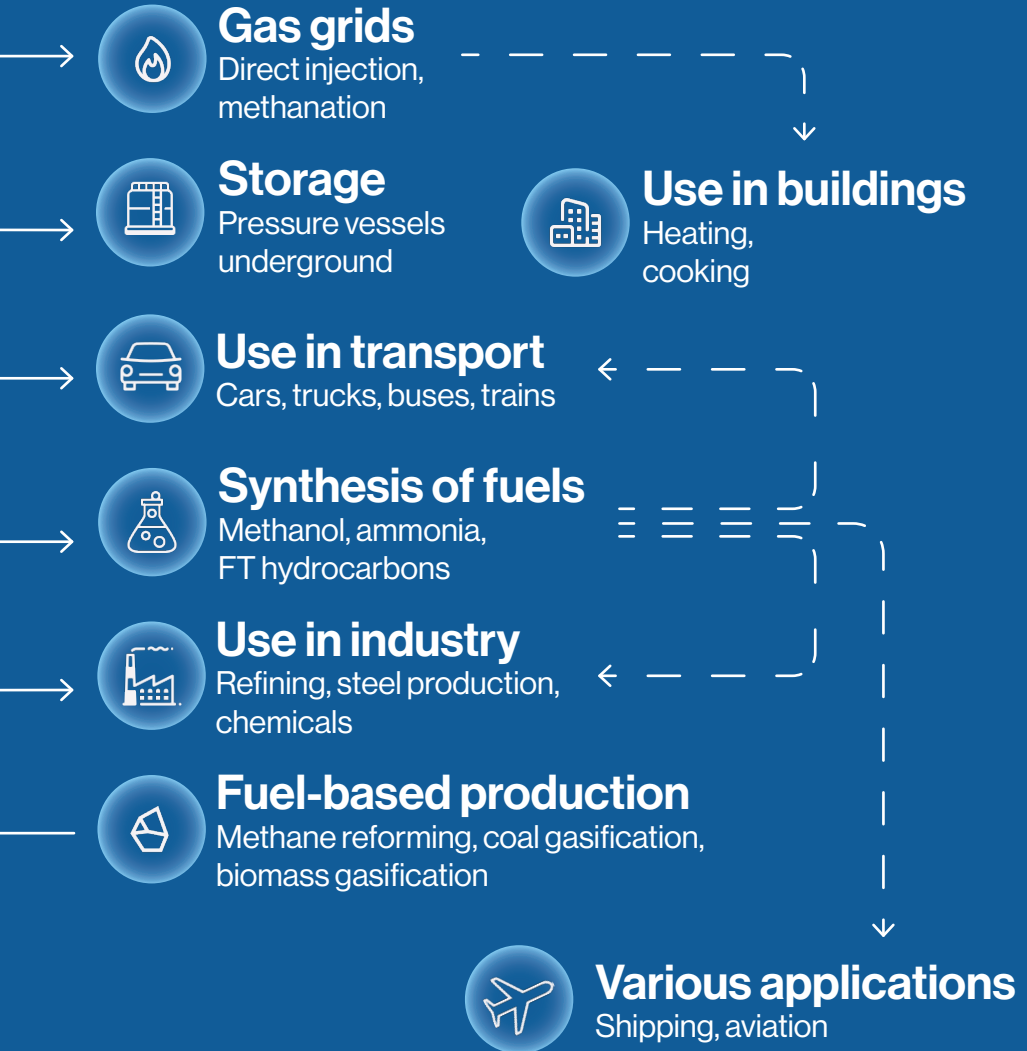
Hydrogen ( $H_2$ ) is extremely flammable (R12) with wide explosive limits between 4 and 75% volume. As it is particularly lightweight, major hydrogen gas hazards are the replacement of oxygen in suspended ceilings and other high up confined spaces. Colorless and odorless, its presence cannot be detected without proper equipment. Even if it is not toxic, high concentrations of hydrogen will reduce the oxygen rate, which can lead to asphyxia. For all these reasons it is important to use an hydrogen monitor to detect dangerous concentrations.



- Hydrogen
- ..... Electricity
- - Other



# H<sub>2</sub> usage



# The Increasing Demand for Gas Detection in the Hydrogen Market: Overcoming Challenges as the Industry Grows

As the world shifts towards more sustainable energy sources, hydrogen has emerged as a leading contender. With its high energy density and potential to emit zero greenhouse gases, the hydrogen market is expected to grow significantly in the coming years. However, ensuring safety in hydrogen production, storage, and transportation poses unique challenges that necessitate deploying advanced gas detection systems.

The importance of gas detection in the hydrogen industry  
Hydrogen is highly flammable and can form explosive mixtures with air or other oxidizers. This inherent risk demands reliable gas detection systems to ensure the safety of personnel, infrastructure, and communities. Gas detection devices are crucial in monitoring and detecting potential leaks, enabling prompt response measures and minimizing the risk of accidents.

## Challenges of gas detection in the hydrogen market

### 1. Detection Technology:

One of the primary challenges in the hydrogen market is selecting suitable gas detection technology. Traditional gas detectors may need help to accurately detect hydrogen due to its low molecular weight and smaller detection thresholds. Development and adoption of advanced detection technologies capable of detecting low levels of hydrogen are essential.

### 2. Calibration and False Alarms:

Detecting hydrogen in low concentrations requires precise calibration to avoid false alarms. Calibration processes must be carefully conducted to ensure accurate detection while minimizing false triggers, which could cause unnecessary disruptions and cost overruns.

### 3. Environmental Factors:

Environmental conditions, such as temperature, humidity, and pressure, can affect the accuracy of gas detection systems. Hydrogen's low boiling point and potential for rapid diffusion pose additional challenges. Ensuring sensors resist environmental factors and are correctly positioned is crucial to maintaining reliable gas detection.

### 4. Compatibility and Integration:

As the hydrogen industry grows, integrating gas detection systems with existing

infrastructure becomes essential. Ensuring compatibility with the latest communication protocols, such as the Industrial Internet of Things (IIoT), facilitates real-time monitoring and predictive maintenance, allowing for proactive risk management.

## Overcoming the challenges

### 1. Technological Advancements:

Significant investment in research and development is required to improve gas detection technology. Collaborations between industry stakeholders, academia, and research institutions are essential for developing susceptible and reliable gas detectors tailored for hydrogen detection.

### 2. Standards and Regulation:

Establishing robust standards and regulations specific to gas detection in the hydrogen industry is crucial. These guidelines should encompass technology, calibration, installation, maintenance, and response procedures.

### 3. Training and Education:

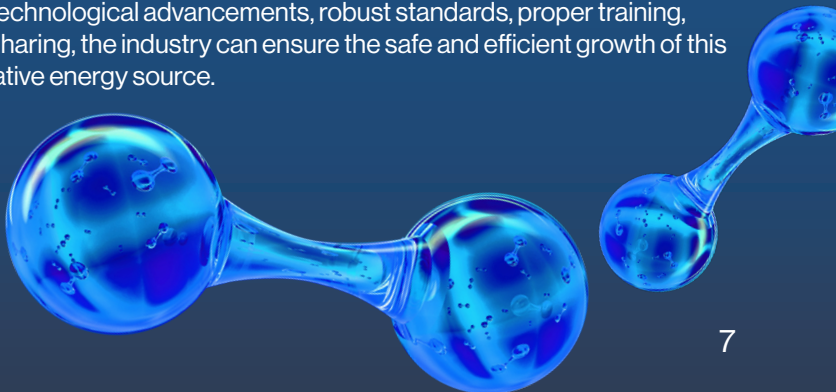
Ensuring that personnel operating and maintaining gas detection systems are adequately trained is vital. Regular training programs should cover the proper use of equipment, calibration techniques, troubleshooting, and emergency response procedures.

### 4. Collaboration and Knowledge Sharing:

Sharing experiences and best practices across the industry can help overcome challenges associated with gas detection in the hydrogen market. Collaborative efforts, industry forums, and knowledge-sharing platforms can facilitate information exchange, accelerate technological advancements, and drive standardization.

### Conclusion

As the demand for hydrogen continues to rise, ensuring safety in its production, storage, and transportation through effective gas detection systems becomes paramount. By addressing the challenges associated with gas detection in the hydrogen market through technological advancements, robust standards, proper training, and knowledge sharing, the industry can ensure the safe and efficient growth of this promising alternative energy source.



## Compatible products

At WatchGas, we always have the right solution for your application. Whether you need portable or fixed, single gas or multi-gas. Please look at our compatible products or contact us directly at [info@watchgas.com](mailto:info@watchgas.com).



### The SST1 H<sub>2</sub> Serviceable

- TWA & STEL Alarms;
- NFC and WatchGas SST Application;
- 3-year battery life based on alarms;
- Serviceable battery and sensors;
- Solid Polymer Sensor Design;
- Two sensor ranges 0-1000 ppm or 0-20,000ppm;
- Largest LCD display in its class;
- External filters.



### SST5

5-gas device that has the 5th sensor as a H<sub>2</sub> option with 0-1000 ppm or 0-20,000 ppm reading. Ideal for Hydrogen and Green Energy market. For more information please contact us at [info@watchgas.com](mailto:info@watchgas.com).



### UNI Sustainable H<sub>2</sub>

- Large LCD, 30% larger than most gas detectors;
- Size: 88 x 62 x 33 mm;
- Weight: 125gr;
- Event logger;
- IP-68;
- Password protection;
- Six bright red flashing LEDs;
- Low, High, TWA & STEL alarms.

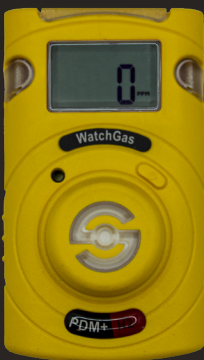






## PDM H<sub>2</sub>

- TWA and STEL;
- Lightweighted & Compact;
- Stores up to 30 events;
- Cost-effective;
- IP-67;
- Fast bump tests with Docking Station;
- Visual, Acoustic and Vibration alarm;
- User-friendly.



## PDM+ H<sub>2</sub>

- TWA and STEL;
- Lightweighted & Compact;
- Stores up to 30 events;
- Low cost of ownership;
- Sustainable;
- IP-67;
- Fast bump tests with Docking Station;
- Visual, Acoustic and Vibration alarms.



## POLI

- Man Down Alarm with real-time remote wireless notification;
- IP-65 (pumped versions) & IP-67 (diffusion versions);
- Water and dust resistant case;
- Real-time gas concentration readings and alarm status enabled by state-of-the-art wireless technology;
- Large graphical display icon-driven user interface ;
- Simple-to-operate two-button user interface;
- Easy access to pump, sensor, filter, and battery;
- Intelligent sensors store calibration data, so they can be swapped in the field.





## AirWatch Mk1.2

- Functions in standalone mode or as part of a mesh network;
- Automatically switches pumps, on/off buttons, ventilation, etc.;
- Developed for demanding environments;
- Can be used inside and outside;
- Flexible and programmable;
- Built-in pump;
- Available with battery pack.



## WatchGas 102

- Data logging;
- Three alarm stages + relays;
- 4-20mA analog output;
- Sensor input select 4-20mA/mV BRIDGE;
- Backlit alphanumeric full status display;
- Front panel access to set up and maintenance of parameters.



## WatchGas Combi 16/64/80

- 1-16 direct 4-20mA sensors – 2/3 wire;
- 1–8 plugin direct catalytic cards;
- Network up to 16 controllers enabling up to 1024 addressable sensors + direct sensors;
- Single 4 core sensor network (addressable);
- Parameter set up via pc or front panel;
- 3 alarm levels with time to alarm option;
- Addressable relay module – 4, 8, and 32-way option;
- Continuous data logging via pc – option (combi soft);
- Automatic safety check diagnostics /system surveillance;
- System management via remote access.





## WatchGas 404+

- Versatile System Configuration;
- Flammable, Oxygen, Refrigerant and Toxic Gases;
- 1 to 4 sensors;
- Plug-in sensor channel cards;
- Two-alarm stages;
- Selectable alarm relays;
- Analogue 4-20mA output;
- Delay to alarm option.



## 15J(WIN) / 30J(WIN)

- Robust and weatherproof;
- Flexible output options;
- Addressable or stand alone;
- Hyper Terminal communications RS232 line data and set up with 232 adapter.



## Defender

Perfect in a great diversity of applications, such as:

- Agriculture;
- Breweries;
- Car parking garages;
- Pools;
- And many more.



## XDI & XDIwin

- Explosion proof;
- Rugged and reliable;
- Addressable or Stand Alone;
- Data logging;
- CANbus / 4-20mA outputs.



XDI



XDIwin

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