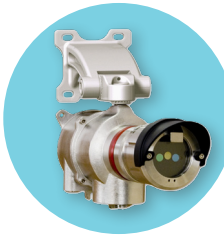




Empowering safety during your hydrogen transition



Flame detectors

Using optical systems capable of "seeing" a hydrogen flame



Portable gas detectors

Single gas and multiple channel equipment and docking stations for daily calibration

Portable GS700 gas leak detector

Ideal for eliminating fugitive leaks in methane-based hydrogen production systems and distribution (PPM, LEL and Volume detection ranges)



GDCloud™

Digitalisation for efficient security and compliance. Location tracking, preventative and condition-based maintenance, intelligent alarm prioritisation, data recording and selective data transfer with leading cyber-security protocols



Controllers and systems

Wired or wireless networks of gas and flame detection equipment to enable integrated site safety strategies



Application Engineering, technical support, installation, maintenance and rental

Expert engineers, service contracts and rental of portable and transportable equipment for end-to-end solutions



Fixed gas detectors

With a range of sensors for hydrogen and other toxic or flammable gases associated with hydrogen production, distribution and utilisation



You focus on your Hydrogen Transition, we focus on your safety.

Comprehensive range of gas and flame detection equipment and services for use throughout the hydrogen value chain

Systems and equipment for gases related to the production of hydrogen, such as carbon monoxide, oxygen and methane

Gas and flame detection equipment and systems for hydrogen derivatives such as ammonia, methanol and synthetic methane

Appropriate technology for hydrogen utilisation applications such as burners, mobility, steel making and fuels processing

Hydrogen gas and flame detection equipment can be integrated into existing compatible gas & flame detection systems

Hydrogen gas and flame detection equipment that could potentially be integrated into SIL2 or SIL3 systems





For a Safe Transition to Hydrogen

ProDetec products, systems and services for the full hydrogen value chain

Electrolysis:
hydrogen and oxygen gas detection

Reforming:
methane, hydrogen, and carbon monoxide gas and flame detection

Methane pyrolysis:
methane and hydrogen, gas and flame detection

Gasification:
hydrogen, oxygen and carbon monoxide gas and flame detection

Hydrogen liquefaction to enable distribution:
hydrogen and oxygen gas detection

Conversion of hydrogen to ammonia for shipping:
hydrogen, ammonia and nitrogen gas detection

Air separation:
gas detection for oxygen for gasification and nitrogen for ammonia

CCS:
carbon dioxide gas detection for carbon capture and storage for blue hydrogen

Hydrogen production

Hydrogen pipelines:
hydrogen gas detection

Hydrogen pipeline recompression:
hydrogen gas and flame detection

Hydrogen gas tube trailer filling:
hydrogen gas and flame detection

Liquid hydrogen tanker filling:
hydrogen gas and flame detection

Liquid hydrogen shipping:
hydrogen gas detection

Liquid ammonia shipping:
ammonia gas detection

LOHC hydrogen shipping:
hydrogen and BTEX gas detection

Hydrogen distribution

LOHC – Liquid Organic Hydrogen Carrier (eg Toluene)
BTEX – Benzene, Toluene, Xylene, Ethylbenzene

Underground hydrogen storage:
hydrogen gas and flame detection

Compressed hydrogen:
hydrogen gas and flame detection

Liquid hydrogen:
hydrogen gas and flame detection

Liquid ammonia terminals:
ammonia gas detection

LOHC hydrogen terminals:
hydrogen and BTEX gas detection

Hydrogen storage

Hydrogenation of edible oils to fats:
hydrogen gas detection

Biofuels hydrogenation:
hydrogen and VOC gas and flame detection

Synthetic aviation fuels:
hydrogen, carbon dioxide, LEL and VOC gas and flame detection

Hydrogen for backup power generation on fuel cells:
hydrogen gas detection

Hydrogen fired gas turbines for power generation:
hydrogen gas and flame detection

Hydrogen conversion to ammonia:
hydrogen, nitrogen and ammonia gas detection

Hydrogen for direct reduction of iron:
hydrogen and carbon monoxide gas and flame detection

Hydrogen blending into gas pipelines:
hydrogen and methane gas and flame detection

Hydrogen for float glass making:
hydrogen gas detection

Fossil fuel desulphurisation and hydrotreating:
hydrogen, hydrogen sulphide, LEL and VOC gas and flame detection

Hydrogen refuelling stations:
hydrogen gas detection

Hydrogen mobility:
hydrogen gas detection

Hydrogen fired burners:
hydrogen gas and flame detection

Hydrogen conversion to methanol:
hydrogen, carbon dioxide and VOC gas and flame detection

Methanation:
hydrogen, carbon dioxide and methane gas and flame detection

Annealing metals:
hydrogen gas and flame detection

Hydrogen utilisation in new and established applications



Such an (extra) ordinary Gas



Is hydrogen gas and flame detection only required during hydrogen production?

Gas and flame detection is required when hydrogen is produced, stored, transported and used. Different equipment and systems are recommended for various applications but safety is a priority throughout the whole length of the hydrogen value chain.

What kind of gas detection sensors are suitable for hydrogen?

Teledyne Gas and Flame Detection uses a range of catalytic and electrochemical sensors in their hydrogen gas detection equipment. For maximum safety, it is recommended to use two different technologies to detect any type of gas, and the same applies to hydrogen.

Will our current LEL flammable gas detection equipment work with hydrogen?

Hydrogen is a flammable gas and can be detected by some LEL sensors. However, not all flammable gas detection systems can detect hydrogen reliably. Consult an expert if there is any change of operating conditions, such as beginning to use hydrogen.

Can my existing natural gas flame detection system work with hydrogen?

Many flame detection systems for use in hydrocarbon processing are configured to "see" combustion products such as water, soot or carbon dioxide. Pure hydrogen burns to form only water so special flame detection equipment must be used with hydrogen.

Are there government subsidies for purchasing hydrogen gas and flame detection equipment?

Subsidies exist for many hydrogen projects, but we are not aware of any special subsidies for implementing gas and flame detection equipment. However international standards and guidance notes require the use of appropriate gas detection systems so they should be budgeted for in hydrogen projects.

Do we need to purchase toxic gas detectors for hydrogen?

Hydrogen is not toxic. However, many thermo-chemical processes that make hydrogen generate syngas, or producer gas, which contains carbon monoxide (CO), which is toxic. In these cases, the use of CO detectors is recommended. H₂ toxic gas detector could be applied, depending the range of detection & alarms levels needed.

Are the fumes from hydrogen combustion toxic?

Pure hydrogen burns to form water, which is not toxic. However, many hydrogen-related applications burn syngas or producer gas which contains CO. Gas detection should consider CO in addition to hydrogen in these cases.

You focus on your Hydrogen Transition, we focus on your safety

Enabling a safe and efficient energy transition

ProDetec stands for the safety of your people and security for your assets.



New equipment installations, transformation of existing processes and upstream feedstocks.

There will be many roads to the hydrogen economy. Decarbonisation of hydrogen production with carbon capture and storage for existing applications of hydrogen such as refined product desulphurisation will be a priority. New applications for hydrogen in aviation, shipping, mobility, heating, power generation and iron and steel making will also pull for new equipment for hydrogen production, distribution and utilisation. Conversion of hydrogen to methanol or ammonia for long distance shipping will also be required. Many of the new processes will also require upstream feedstock production, for example gasification to make hydrogen from coal or biomass needs oxygen and ammonia production needs nitrogen.

Whatever the production technology, whatever the distribution and storage mode, whether it is decarbonisation of existing processes or investment in new assets, Teledyne Gas and Flame Detection is ready to support the safe and efficient development of the hydrogen economy and other related decarbonisation technologies.