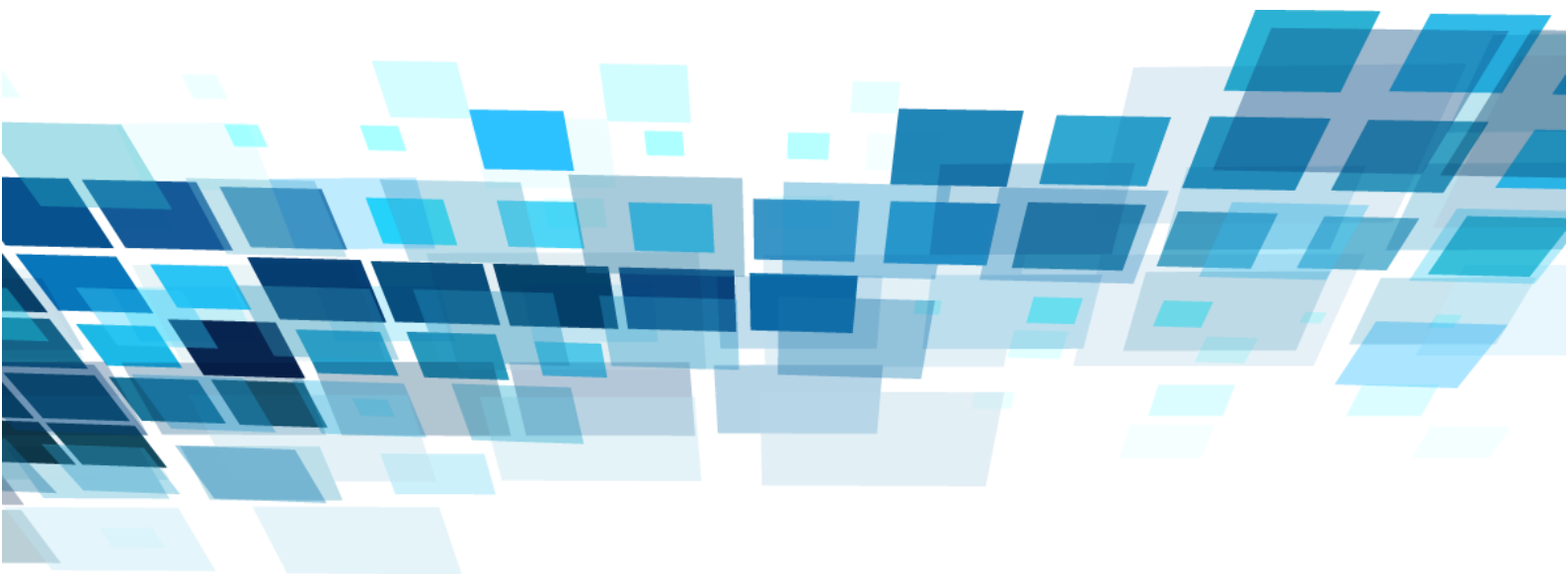


HYDROGEN MOBILE FUELLING STATIONS



Pure Energy Hydrogen s.r.l.

Global Pioneer and supplier of quality hydrogen solutions

HYDROGEN FUELLING STATION

Installing hydrogen fuelling stations since 2005

The Pure Energy Hydrogen is a global supplier for hydrogen filling stations and dispensers for 350 and 700 bar vehicles.

Our Hydrogen filling stations are purposely built and customised to your bespoke requirements all with the latest innovations in safety and operation. All our design and manufacture provide the standard functionality of a traditional gasoline dispenser.

If you have a fleet of vehicles, buses, forklifts, tractors, motorbikes or you have a hydrogen internal combustion engine converted vehicle, a hydrogen filling station is your next step towards to reach a zero emissions transport.

The Station includes production, compression, storage and dispensing to vehicles in a compact and versatile footprint. The Pure HyPOD[®] concept with housing in ISO shipping container offers a plug and play solution for mobile or stationary setup.



Micro Mobile Hydrogen Fuelling Station

The Micro mobile fuelling station can produce Pure Hydrogen® and compress up to 900 bar. Gas is stored internally within the station and allows a quick dispense into vehicles up to 700 bar.

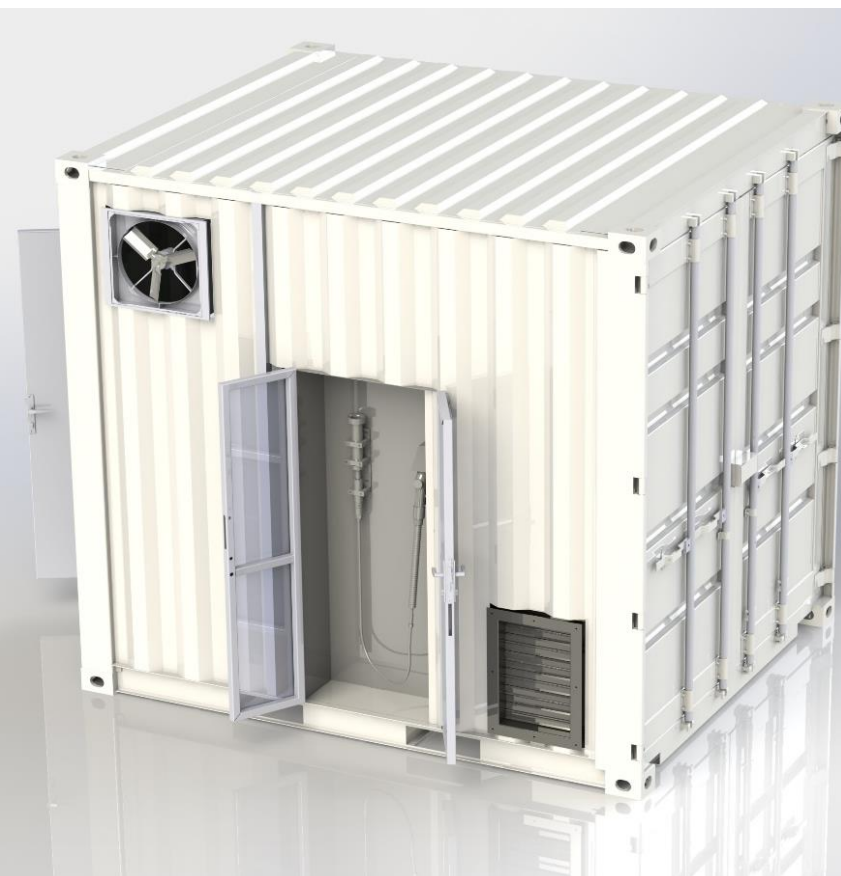
The Micro mobile hydrogen fuelling system has a compact footprint. It is integrated within a standard 10' ISO shipping container.

The system requires only electricity and a water source and can dispense 99.999% pure hydrogen.

Input water is first filtered in a unique filtration system that produces ISO 3696 type 2 purified water with a fixed residue of less than 1 PPM, which prolongs the life of the electrolysis process.

Electricity can be supplied from Renewable energy; the system adapts its production automatically in relation to the Renewable energy available at site.

- Compact footprint
- Plug and play concept
- Scalable with capacity up to 10kg/day
- Mobile arrangement in ISO 10" container
- Remote control and monitoring capability
- Variable gas production to follow Renewable Energy



The H₂ production is performed using latest Electrolysis technologies. The production module can be based on AEM, PEM or Alkaline Electrolysis technology.

All of them, allow a reliable and ultra clean on-site H₂ production directly from water and electricity.

The compression is based on reciprocating oil free diaphragm compressor. This technology is able to reach compression performance up to 900 bar, guarantee zero contamination and absolute purity as the gas at intake. Hydrogen is then stored in high pressure steel cylinders to allow quick dispensing into the vehicle.

Features

- H2 Production Capacity: 2kg/day. Can be expanded up to 10kg/day
- H2 Storage capacity 7kg at 450 barg.
- Diaphragm compressor up to 700 bar.
- H2 dispensing for H70 Hydrogen up to 700 bar.
- Fuelling capacity 5kg at 700 barg in about 30 minutes.
- Hypod housing in ISO 10" Container

H2 ELECTROLYSER

Hydrogen is produced using state of the art AEM electrolysis of water to produce hydrogen through the use of electricity. Equipment is provided with all necessary auxiliary items to provide safe reliable onsite hydrogen production, including water treatment, gas purification and safety systems.

Electrolysis Technical Specifications

Electrolyser type	AEM
Maximum H2 Production	1Nm3/h – can be expanded up to 5 Nm3/h
Output pressure	30 barg.
H2 purity	99.999%



H2 STORAGE

The Pure MCP-500bar storage system is made with a manifold cylinder pack consisting of 5 cylinders. The Pure MCP is based on Steel cylinders K-type with void volume of 50 Liters and working pressure of 500 bar. The MCP frame has attachments secured within the container structure and is supplied with overpressure safety valves and H2 leak detection system.

H2 storage Technical Specifications

Maximum working pressure	500 barg.
Cylinder material	High grade steel
Cylinder volume and quantity	50 Litres, 5 units.
Total H2 capacity	7 kg @ 450barg.

H2 COMPRESSOR

This Pure H2 Compressor oil-free model is designed for an inlet pressure of 5 bar with an output maximum delivery pressure up to 700 barg. Equipment is provided with all necessary auxiliary items to provide safe reliable onsite hydrogen compression. Inside the compressor, the gas wet parts will be in contact with only stainless steel. The static seals of the membrane compressor guarantee zero gas leakage. Of critical importance, the compressor conforms to CE/PED/ATEX standards.



H2 Compressor Technical Specifications

Minimum suction pressure	5 barg.
Flow rate	5Nm3/h @ 30 inlet pressure
Discharge pressure	H2 storage Line at 450 barg H2 vehicle line 700 barg
Compressor type	Oil free reciprocating diaphragm

The compressor includes an inlet gas filter of 7 μ m on the hydrogen gas side on each compression stage. This prevents any debris entering into the compression system and prolong the lifetime of the diaphragm membranes. Temperature is monitored continuously at each stage and cooling of the compressor and of the hydrogen gas is achieved with unique cooling system with inter & after coolers.

To obtain the highest protection to the compressor and other surrounding equipment, a pressure relief valve has been inserted between each stage and a triple redundant overpressure safety protection at the outlet of the compressor. This includes pressure transducer, pressure safety switch and pressure safety valve.

All the electrical and mechanical instrumentation installed on board of the compressor is suitable for Atex classified zone (minimum zone 2). The compressor electrical motor is IP55 Eexd IIC rated. Signals from onboard instrumentations allow the monitoring and controlling in real time of the compressor operation; information are shown on the HMI panel of the compressor control unit

H2 DISPENSER

The Pure H₂-Dispenser includes a PLC based control system and a user interface with HMI panel. The refuelling process is completely operated, controlled and monitored from the HMI user interface of the dispenser control unit.

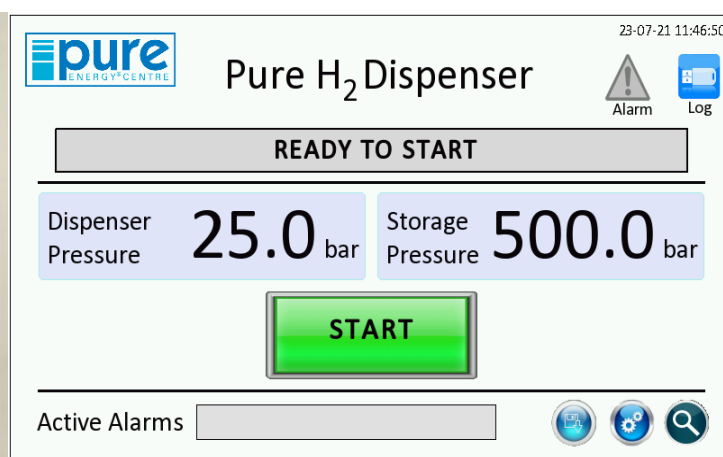
When using the Dispensing system, the management of the storage banks is completely automatic, the operator should perform only the START command from the HMI panel.

The Dispenser is able to communicate with sensors and actuators installed on an internal priority panel that manages the hydrogen storage and dispensing

with compressor, this allows to monitor the fuelling process, visualise the pressure level on the screen of the HMI and visualise the pressure on the vehicle while dispensing.

H2 Dispenser Technical Specifications

Maximum working pressure	900 barg.
Fuelling pressure	700 bar
Fuelling capacity	5 kg at 700 bar in 30 minutes.
Dispenser Nozzle	TK17 type

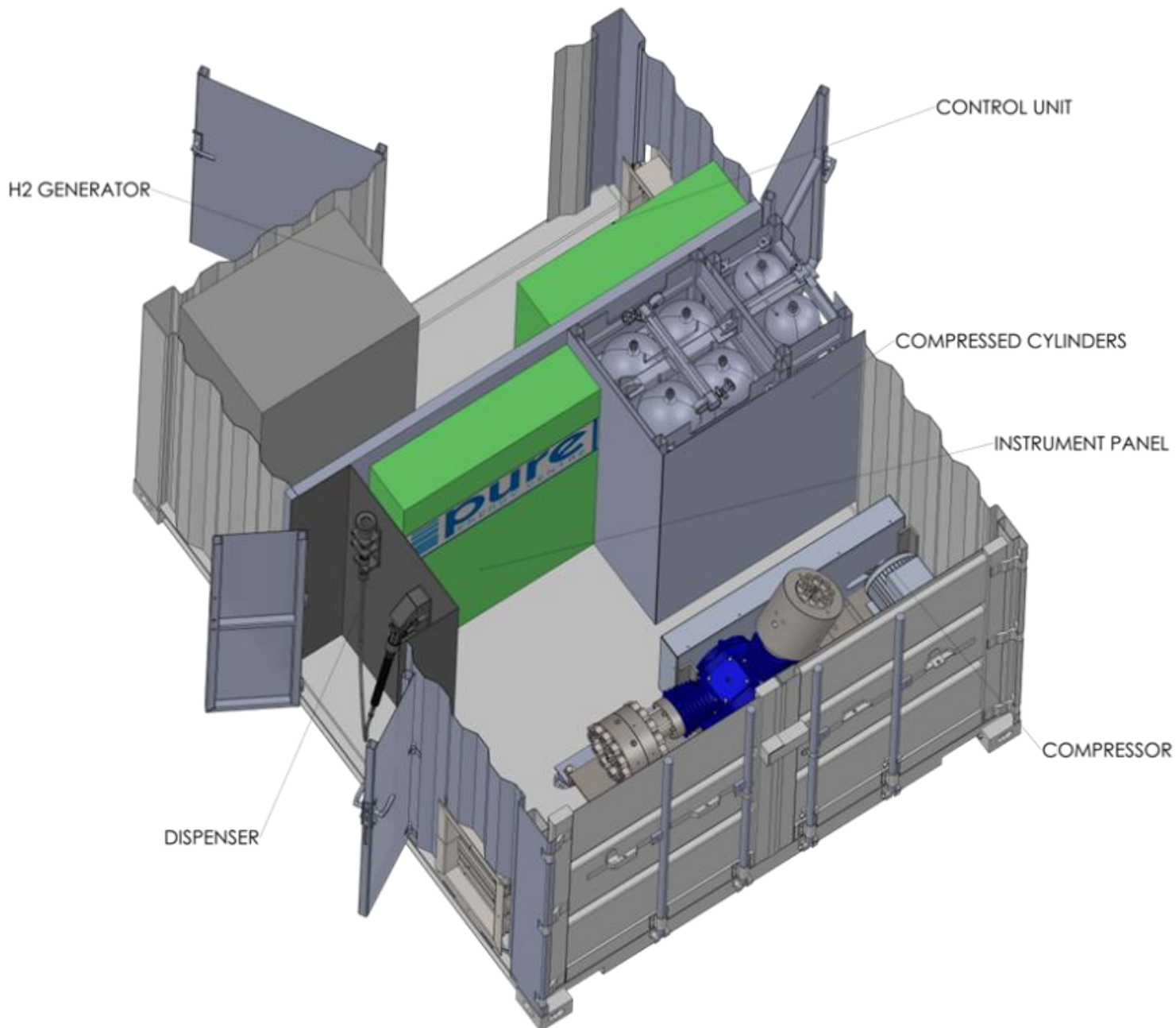


HyPOD®

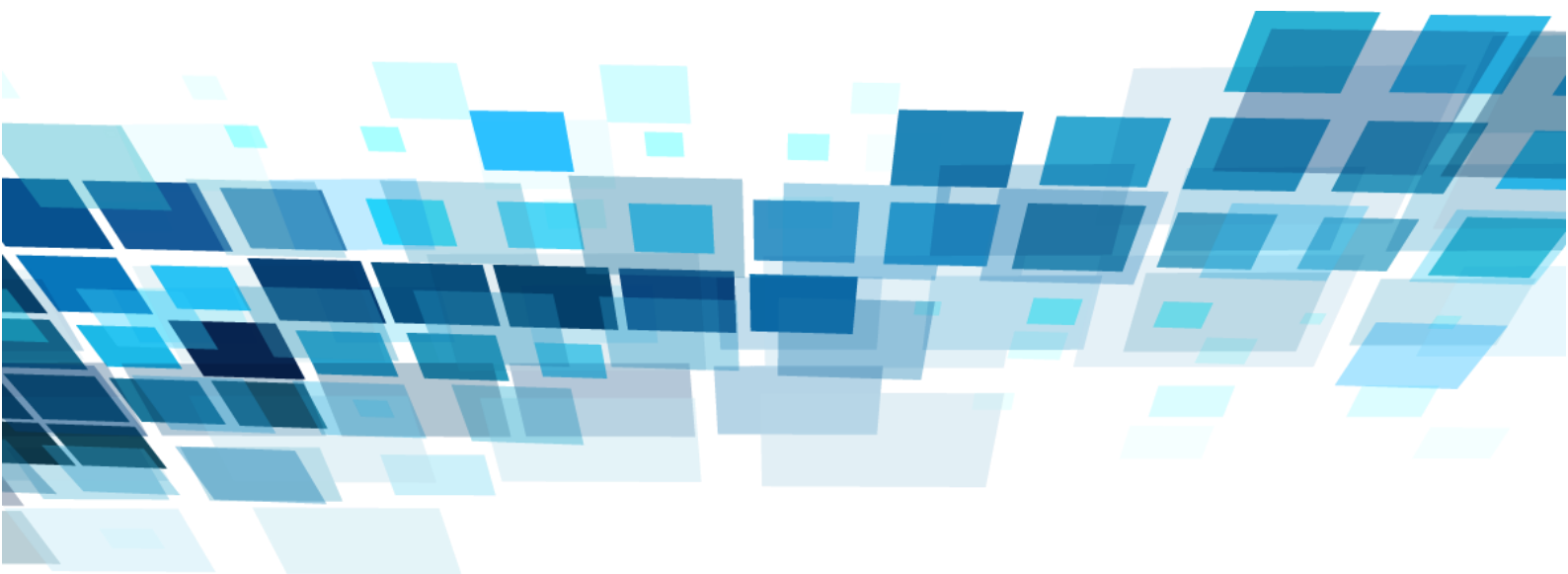
The installation of the Hydrogen system all valves and the electric boards in performed in a ISO modified container. The container is named HyPOD®. Temperature conditioning unit will be installed in the electric and process rooms and detectors in both gas and electric room. The main gas room and the electric room will be also ventilated with a fan. Within the containerised HyPOD® package all auxiliary devices will be integrated including:

- Hydrogen generator, compressor, dispenser and storage
- Electrical control board and distribution.
- Electrical cables between equipment.
- Interconnecting Gas piping between equipment.
- Gas leak detection system with system interlock
- Segregated process and control areas.
- Climate control system.
- Lighting system (Atex comply in the process gas room)
- Emergency shutdown equipment
- Active ventilation system

Micro Mobile Hydrogen Fuelling Station



- Compact footprint
- Plug and play concept
- Scalable with capacity up to 200kg/day
- Mobile arrangement in ISO container
- Remote control and monitoring capability
- Variable gas production to follow Renewable Energy



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