

Atlas Copco



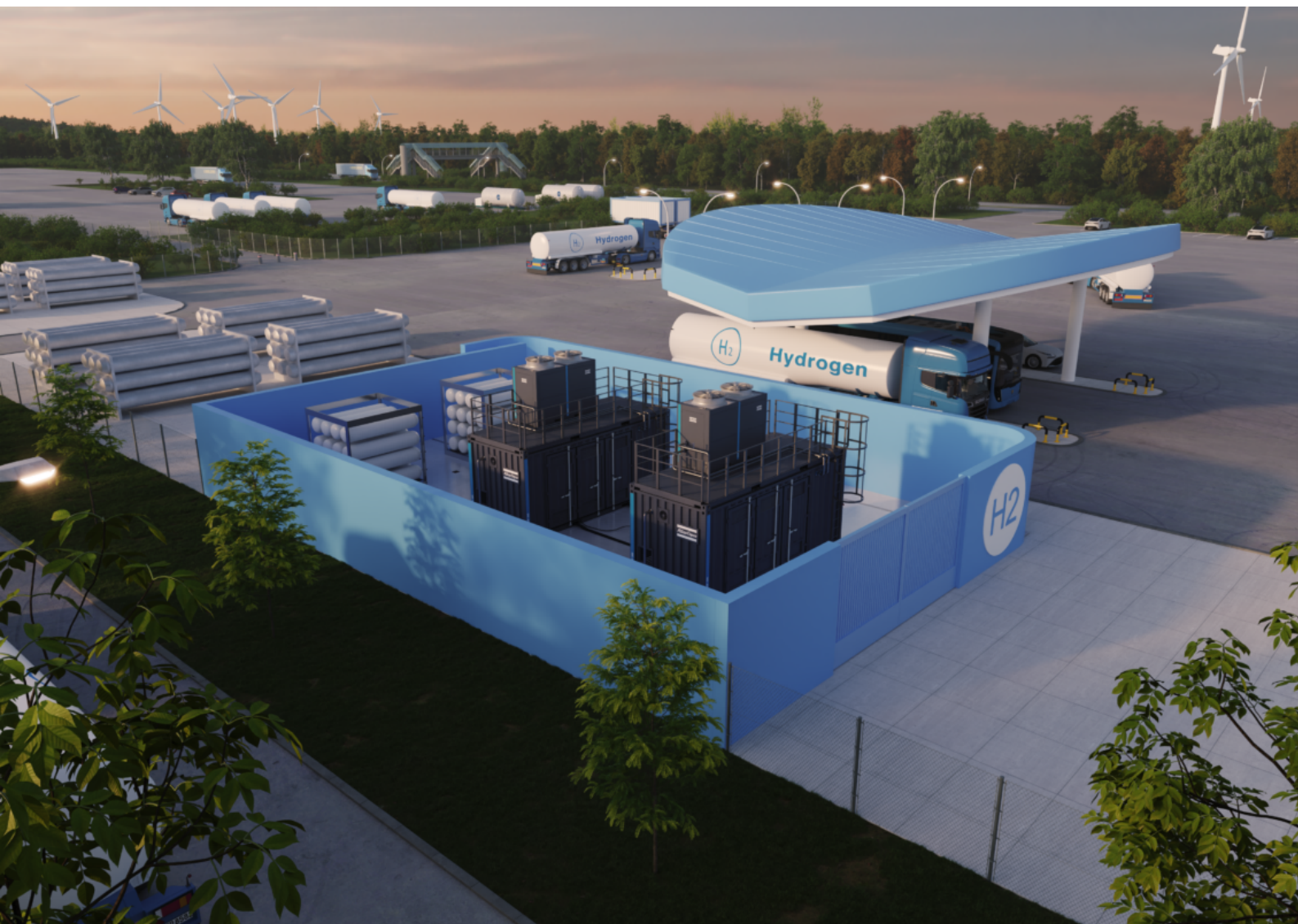
# H2Y Hydrogen Hydraulic Booster

True 24x7 high pressure booster for mobility & more.

# Leading innovation for the hydrogen economy

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As a vehicle fuel, hydrogen has the potential to decarbonize mobility. H2Y compressors were developed to support hydrogen refueling and trailer filling stations as they develop this exciting resource. Whether you are adding to your fueling infrastructure or just getting started, these ultra-reliable boosters have the technologies you need to maintain constant discharge pressure in varying conditions. Efficient and cost-effective to run, they deliver peak performance in 24/7 service, helping you lead the way to a more reliable transport and mobility sector.





### Safety

Safety features specifically for the challenges of hydrogen handling



### Gas quality

Oil-free technology to protect your output



### Reliability & durability

Dependable operation with low maintenance and long service intervals



### Energy efficiency

Tailored technologies, including Variable Inlet Pressure & Variable Piston Pump options



### Atlas Copco expertise

Proven legacy in hydrogen, and the industry's largest service organization



### Serviceability

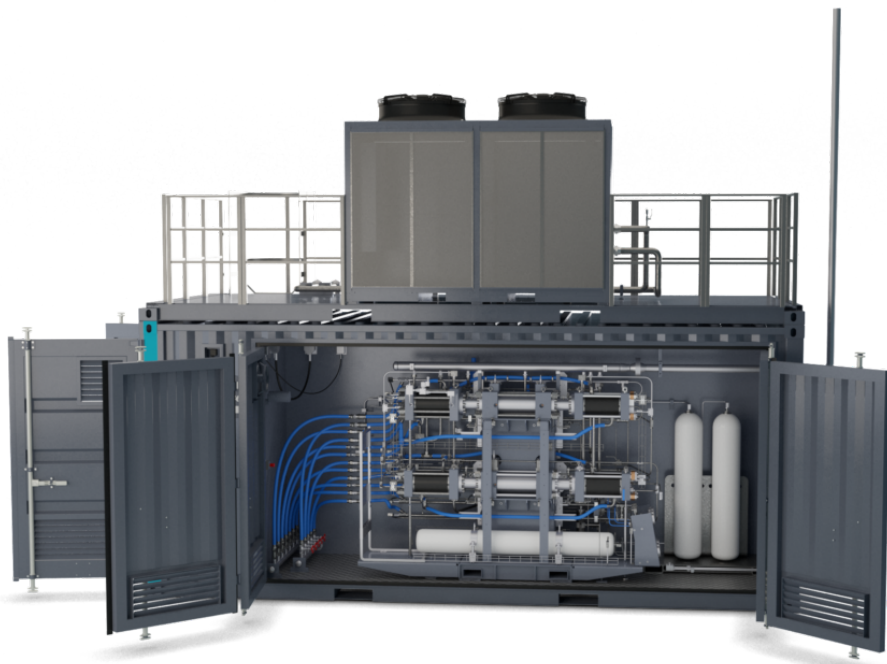
Straightforward maintenance and high uptime to keep your operation running at maximum availability



# A Plug & Play system to match your needs

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H<sub>2</sub>Y compressors feature a modular design that makes them easy to integrate into any hydrogen storage or Hydrogen Refueling Station (HRS) system. The standard compressor is supplied in a 20-foot container, combining easy transportation and outdoor installation with maximum flexibility when it comes to space utilization. The standard package includes the compressor, chiller, pre-cooler, intercooler, and aftercooler. These are supplied, along with all the other components you need, as one smart Plug & Play solution.





# Engineered for efficient hydrogen compression

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H<sub>2</sub>Y compressors are designed to meet the specific challenges of hydrogen compression and storage. Along with maximum reliability, we prioritized safe handling and zero contamination, delivering the quality you need. Explore the highlights below to find out more.



# H2Y

## FIRST VIEW



## SECOND VIEW





## 1 Control panel

- SIL level components (where needed) for managing safety
- Novel control philosophy
- In built UPS for fail safe operation
- Customer connectivity
- Fast acting PLC for reliable and efficient operation
- Variable inlet pressure and variable piston pump with AC logic to provide peak performance



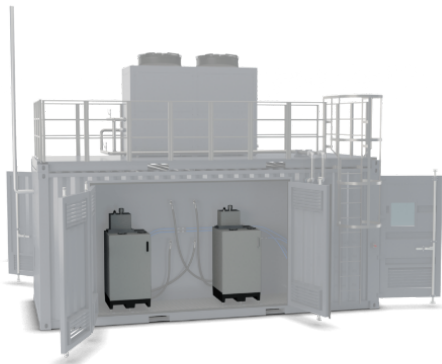
## 3 Container

- Plug and Play solution
- Easy to transport and install
- In built safety system
- Exhaust system to ensure safe operation
- Integrated ladder for easy accessibility
- PLC mounted within container in safe area



## 2 Hydraulic power unit

- Atlas Copco own integration software to ensure energy efficiency and reliability
- Low power
- Low need of oil
- Low noise

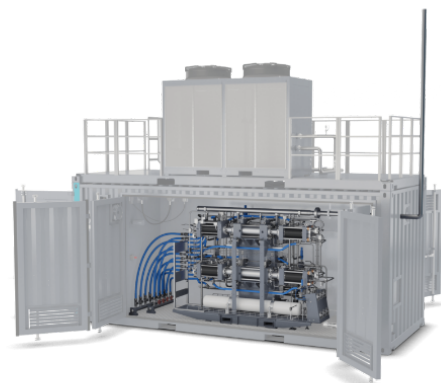


## 4 Atlas Copco TCX chiller



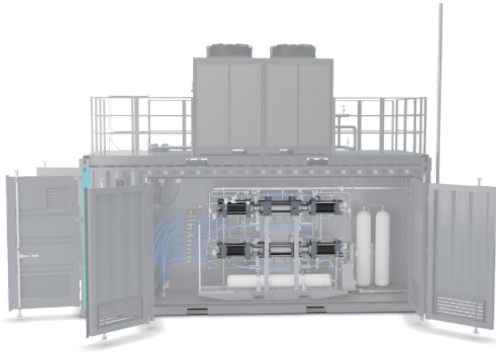
## 5 Core unit design for long service intervals

- High quality cooling cylinder jackets
- Large compression chambers with ideal pressure ratio and RPM
- No blow-off during stop and restart
- Stage bypass system
- Extremely low vibration and pulsation



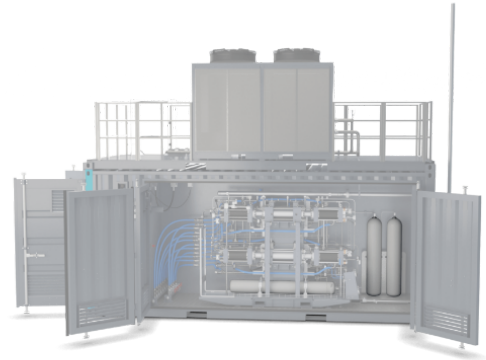
## 6 Distance piece

- 100% oil-free
- Reliable Atlas Copco piston rings for long life
- Long distance pieces ensure compression chambers are perfectly oil-free
- No risk hydrogen contamination



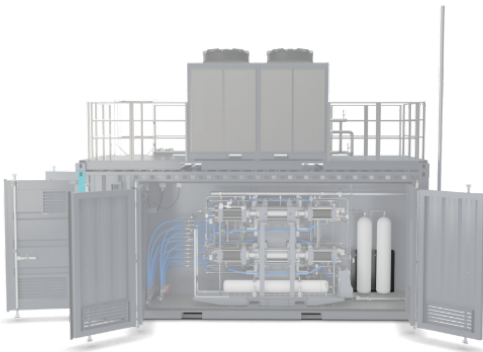
## 8 Buffers

- Inlet buffer to have steady inlet pressure readings from electrolyzers
- Available in ASME & PED versions



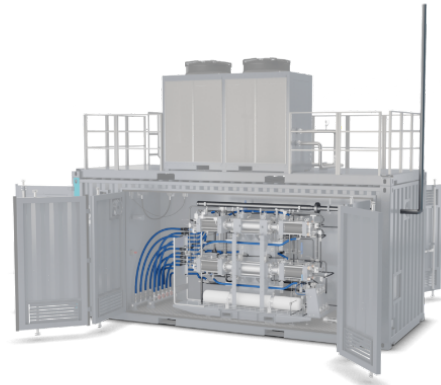
## 7 Leakage management system

- Automatic gas and oil chamber flushing system for manless operation
- Preventive maintenance through monitoring trends of Oil & Gas leakage



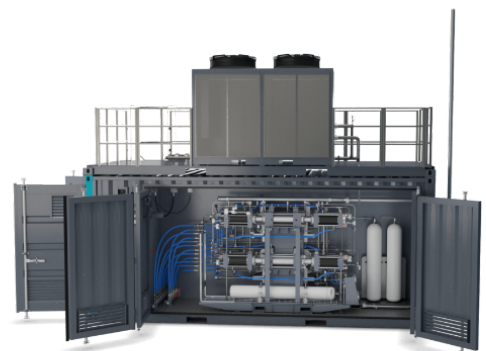
## 9 Piping & tubing

- All parts coming in contact with H<sub>2</sub> are SS 316L or SS alloys
- Integrated tube in tube coolers



## 10 Safety in design

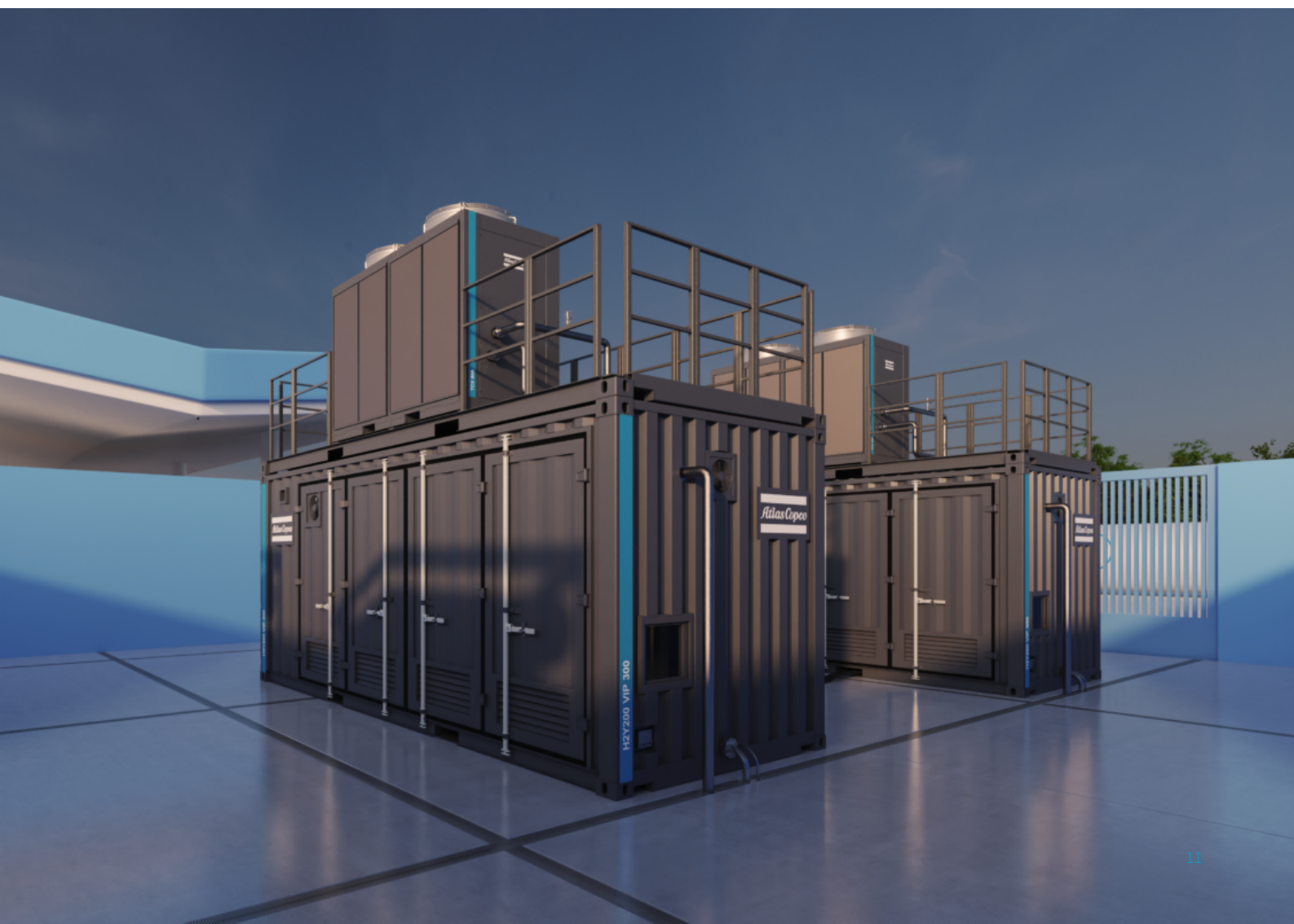
- 1x gas and flame detectors for explosion proof zone
- 2x extraction fan (explosion proof)
- Ergonomically located emergency shutdown buttons
- Appropriate grounding between control panel and compressor



# All-in-one water chillers: the perfect H2Y partner

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The Atlas Copco TCX series of compact all-in-one water chillers offers a perfect complement to the H2Y compressor in your HRS system. Featuring an air-cooled condenser with an integrated hydro module, these chillers are specially designed for cooling water (or a mixture of water and glycol) for a plug and play solution.

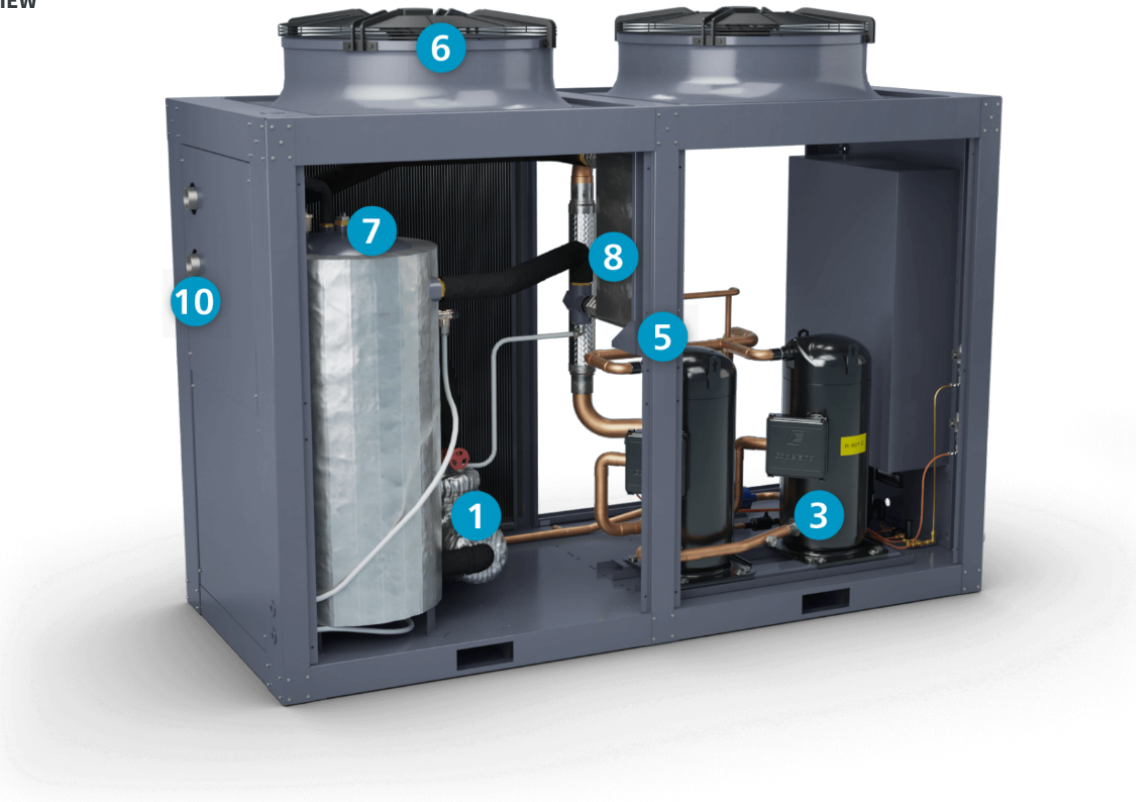


# TCX chillers

## FIRST VIEW



## SECOND VIEW



## 1 Quality stainless steel components

- Stainless steel tank and centrifugal pump hydraulic parts
- Factory installed and tested
- Prevents contamination of process water with rust particles
- Superior reliability and temperature control



## 4 Robust IP54 rated canopy

- Galvanized steel structure painted with epoxy-polyester powder
- Usable indoors and outdoors without additional protection
- Suitable for ambient temperatures down to -10°C
- Reduces noise and impact on working environment
- Small footprint adds flexibility and saves space



## 2 State-of-the-art microchannel condensers

- Simple, lightweight aluminum microchannel design
- Coated for long life without corrosion
- 30% lower refrigerant charge compared to other standard types of heat exchangers
- Reduced maintenance costs



## 5 Wide doors and convenient component layout

- Easy access for inspection and servicing
- Reduced maintenance time
- Lower risk of breakdowns



## 3 Fully hermetically scroll compressor

- Fully hermetically sealed refrigerant compressor prevents refrigerant gas leaking
- No maintenance required
- Phase sequence relay avoids compressor failure in case of changing power supply



## 6 Reliable cooling

- Simple, robust and durable
- Cost-saving on-off regulation
- Innovative blade profiling for superior efficiency
- Variable speed regulation (phase-cut and EC fans) options available for operation in lower ambient temperatures



## 7 Wide range of safety devices

- Flow and level switches
- Thermal and pressure probes
- Crankcase heating
- Strainers
- Controller combines all chiller sensors into one system
- Timely warnings issued if operating parameters deviate from standard values



## 9 Elektronikon® MkV Touch unit controller with SMARTLINK software

- Energy-efficient Atlas Copco algorithms
- Continuous control of chiller parameters
- Effective integration into existing central control systems
- User-friendly interface
- **SMARTLINK** provides insights to enhance uptime and energy efficiency



## 8 Copper brazed plate evaporator

- Reliable stainless steel, withstands long-term temperature loads
- Compact, lightweight design



## 10 Easy Plug & Play connections

- Supplied as all-in-one package
- Fully assembled and tested in our factory
- Quick, trouble-free installation



## 11 IE3 rated efficient motor

- Ideal for continuous operation
- Delivers substantial energy savings



# Innovation for reliability and cost savings

Like all Atlas Copco equipment, H2Y compressors are engineered to deliver exceptional value to our customers. Specifically designed for HRS and trailer filling applications, these compressors integrate essential features and qualities to optimize your setup, ensure reliable output, and drive your business growth.

## Maximum safety in hydrogen handling

Safety is paramount when dealing with hydrogen. H2Y hydraulic hydrogen compressors are engineered to minimize risks associated with gas leakages, contamination, and other potential hazards. Each compressor package is equipped with advanced safety instrumentation and control loops to enhance reliability and provide peace of mind.

Our hydrogen compressors comply with major international and local safety codes. Each compressor undergoes rigorous testing at our facilities to guarantee optimal performance and safety. These measures reflect our commitment to providing safe and efficient hydrogen handling solutions that protect your operations and personnel.



## Pure oil-free hydrogen to protect your HRS operation

Fuel cell operations depend on high quality oil-free hydrogen to avoid risks relating to product spoilage, vehicle failure, downtime, and legal issues. H2Y compressors ensure oil-free compression to maintain gas purity and integrity. Their advanced technologies deliver the hydrogen quality you need to protect your business and meet stringent industry standards.

- Distance pieces equipped with oil sealing rings ensure physical separation between the transmission and the cylinders.
- The length of the piston rod is calculated so that no part in contact with oil enters the compression chamber.
- Packings with sealing rings ensure tightness between the cylinder and distance piece.

## Smooth, reliable production with low maintenance

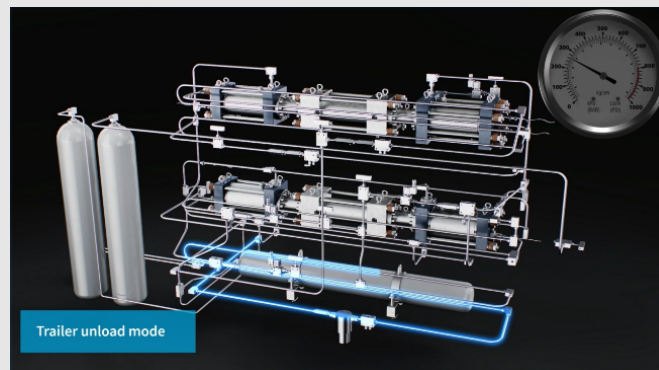
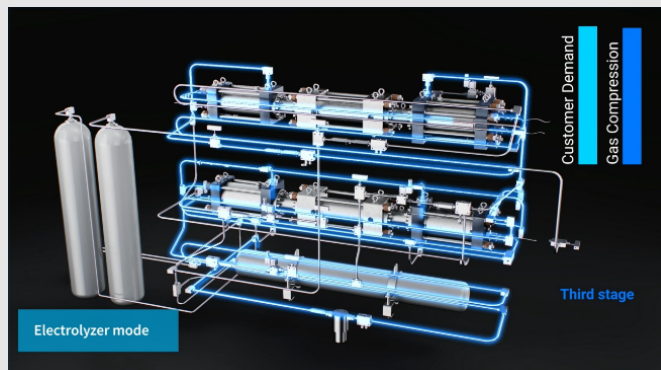
H2Y compressors are designed for 24/7 industrial service, ensuring a smooth and reliable hydrogen supply without constant supervision. With high-quality stainless steel components and minimized noise and vibration, they deliver continuous, dependable, and safe operation. Their low maintenance requirements reduce downtime and help keep costs in check.

## VPP (Variable Piston Pump)

A Variable Piston Pump version is available to maintain a set pressure at the inlet pressure vessel. This advanced technology ensures that the compression rate follows electrolyzer and SMR production rates, helping to drive greater efficiency and sustainability in hydrogen refueling and trailer filling operations.

## VIP (Variable Inlet Pressure)

H2Y compressors are available in a variable inlet pressure version suitable for trailer unloading. This version adapts to inlet pressures ranging between 300 to 20 bar. When the inlet pressure is high, the gas goes through a single stage of compression. If the inlet pressure drops (e.g. below 170 bar), a second stage of compression is activated. This system ensures consistent peak performance and maximum energy efficiency even when conditions are variable.



## A name you can trust in a changing world

The industrial world is evolving fast as we transition towards new energy sources in an effort to meet ever more urgent climate targets. With over 150+ years of experience, Atlas Copco has built an enviable reputation as a master in compression technology. We are passionate about meeting all our customers' needs, embracing new challenges with expertise, innovation, and outstanding product and component quality. Capably handling a wide variety of gases and gas mixtures, we can tailor our compressors to the specific requirements of your processes.

### Always there for you

We care about the reputation of the business you have built. Along with first-class reliability to ensure uninterrupted production, we are committed to excellent service with strong local presence. Our expert teams are always on hand to answer questions, discuss solutions and take care of your servicing and maintenance needs.



# Smart gas solutions for your process

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The unique modular concept means that H2Y compressors can be installed in a range of systems and combinations. This offers you maximum flexibility as well as the potential to scale up as requirements change.

## A constant supply of compressed gas

Fast fill for a range of inlet pressures with constant supply of compressed gas. A reliable hydrogen fueling installation is key, as any downtime of your compressed gas installation will immediately impact your revenue.

From 'fast fill', large flow H2 fill station solutions to daughter stations in a virtual pipeline, Atlas Copco protects your hydrogen booster delivery chain with efficient, reliable, and safe solutions. Our containerized Plug & Play units are factory tested to ensure a long lifetime of trouble-free operation and 100% oil-free compressed hydrogen.

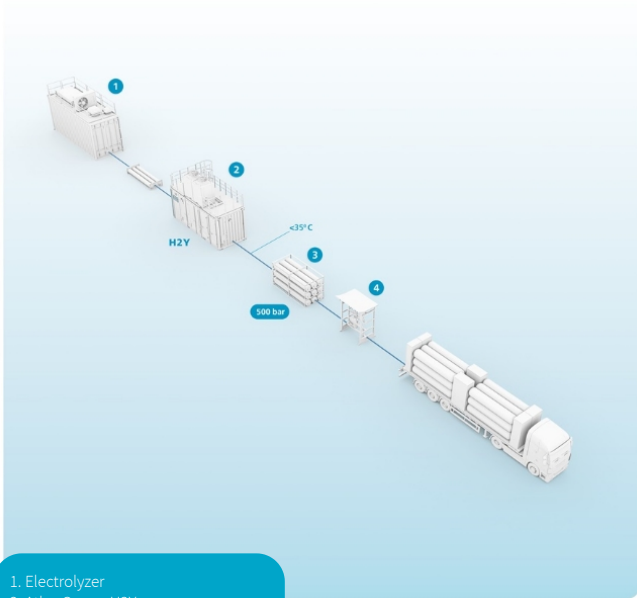


## Mother and daughter hydrogen stations

When operating a virtual gas pipeline from the supply line to a daughter station, the focus is on speed and efficiency. Our systems are designed to achieve this by minimizing pressure losses and ensuring the same high efficiency as you would expect when filling directly from a supply line. H2Y hydraulic compressor packages for daughter stations support the virtual pipeline segment by:

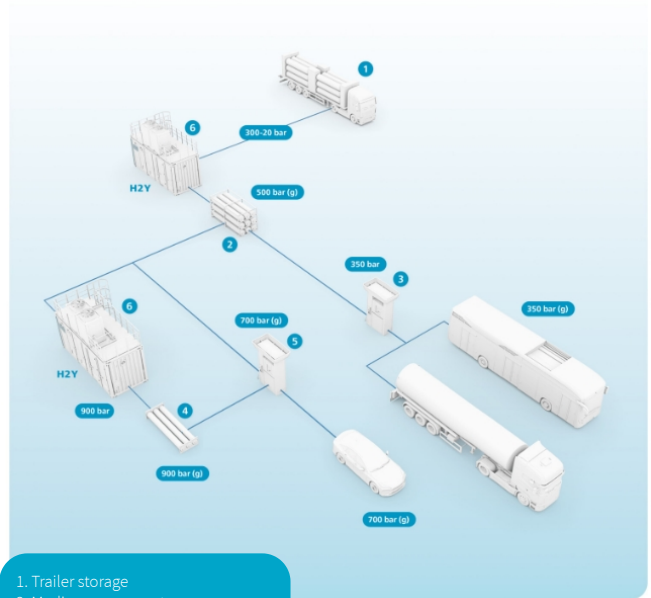
- eliminating the need for an external PRV (they accept variable inlet pressures from 300 bar to 20 bar)
- decreasing trailer unloading time by managing high inlet pressures and flows
- significantly reducing energy consumption by automatically adjusting to possible variations in inlet pressure, preventing pressure losses through regulators
- maintaining a constant flow rate

# Mother station to truck (VPP)



1. Electrolyzer
2. Atlas Copco H2Y
3. Medium pressure storage
4. Filling panel

# Daughter station from truck (VIP)

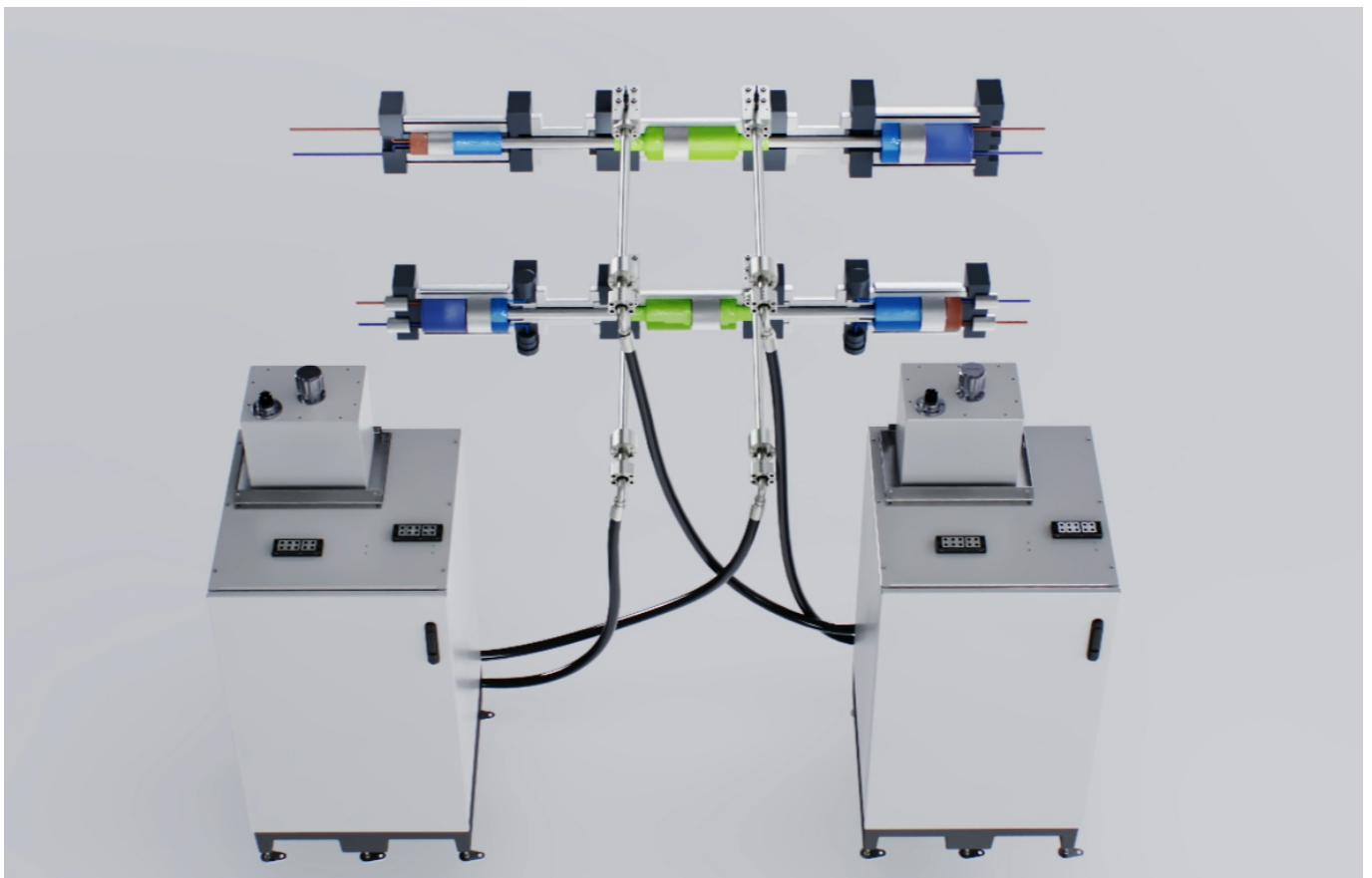


1. Trailer storage
2. Medium pressure storage
3. Dispenser
4. High pressure storage
5. Dispenser
6. Atlas Copco H2Y

# Working principle

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The working principle of the pistons in the H2Y revolves around the use of hydraulic pressure to compress hydrogen gas. In this system, hydraulic fluid is pumped into a cylinder, causing a piston to move. As the piston travels downward, it compresses the hydrogen gas that is contained in a corresponding cylinder, increasing its pressure. The reciprocating motion of the piston, driven by the hydraulic force, allows for efficient and continuous compression of the hydrogen, facilitating its storage and transport. This design ensures that the compressor operates smoothly and effectively, maximizing efficiency while minimizing energy loss.



# Technical specifications

## VIP

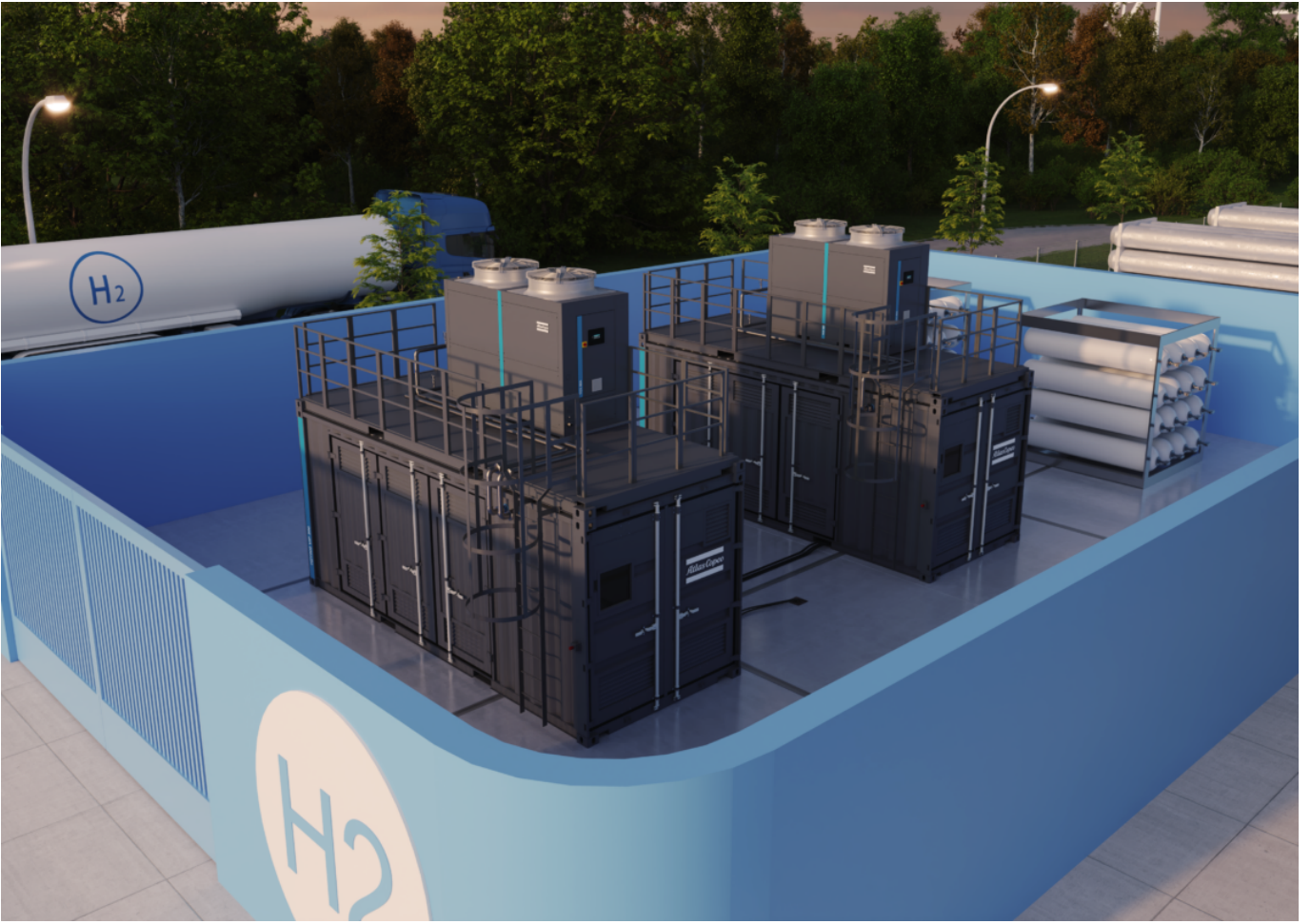
Sr No	Model	Inlet Pressure (Barg)	Discharge Pressure (Barg)	Gas Flow (Kg/hr)	Installed Power* (kW)
1	H2Y 174 VIP-500-H2	50	500	58	174
		300		115	
2	H2Y 174 VIP-380-H2	35	380	41.3	174
		300		116.2	
3	H2Y 87 VIP-500-H2	50	500	29	87
		300		57.5	
4	H2Y 87 VIP-380-H2	35	380	20.7	87
		300		58.1	
5	H2Y 42 VIP-500-H2	50	500	14.8	42
		300		24.3	
6	H2Y 42 VIP-380-H2	35	380	10.4	42
		300		24.8	

## VPP

Sr No	Model	Inlet Pressure (Barg)	Discharge Pressure (Barg)	Gas Flow (Kg/hr)	Installed Power* (kW)
1	H2Y 174 VPP-500-H2	20	500	35.3	174
		30		46.8	
		40		46.1	
2	H2Y 84 VPP-500-H2	20	500	16.6	84
		30		20.3	
		40		19.4	

(\*) : The installed power values do not include the chiller power or other auxiliaries inside the container. They only represent the motor power for the HPUs.

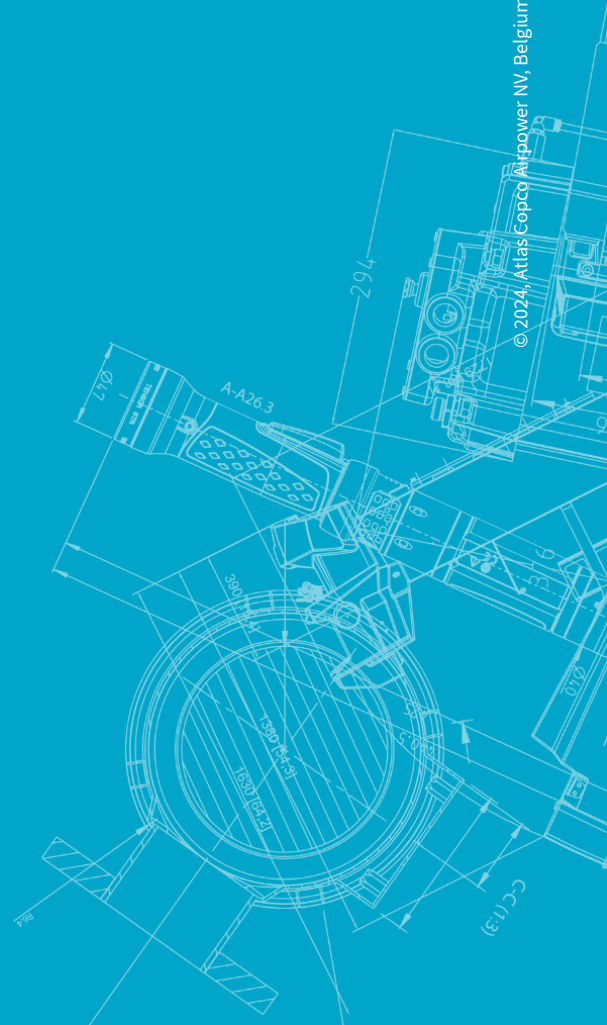
The shared performances, pressures are considered at bar(g), gas temperature considered at 20°C for all inlet stages. Cooling Water between 5 to 10°C.





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