

Technology & solutions for a sustainable development



Clean Energy[®]
COMPRESSION



**idro
meccanica**

Mission

We believe that world development is driven by the production and use of **clean energy**.

Protecting the environment and ensuring **sustainable development** is our mission.

Driven by this mission, we build **infrastructures** for the use of **natural gas, biomethane** and **hydrogen** as primary energy sources, providing solutions along the **entire energy value chain**.

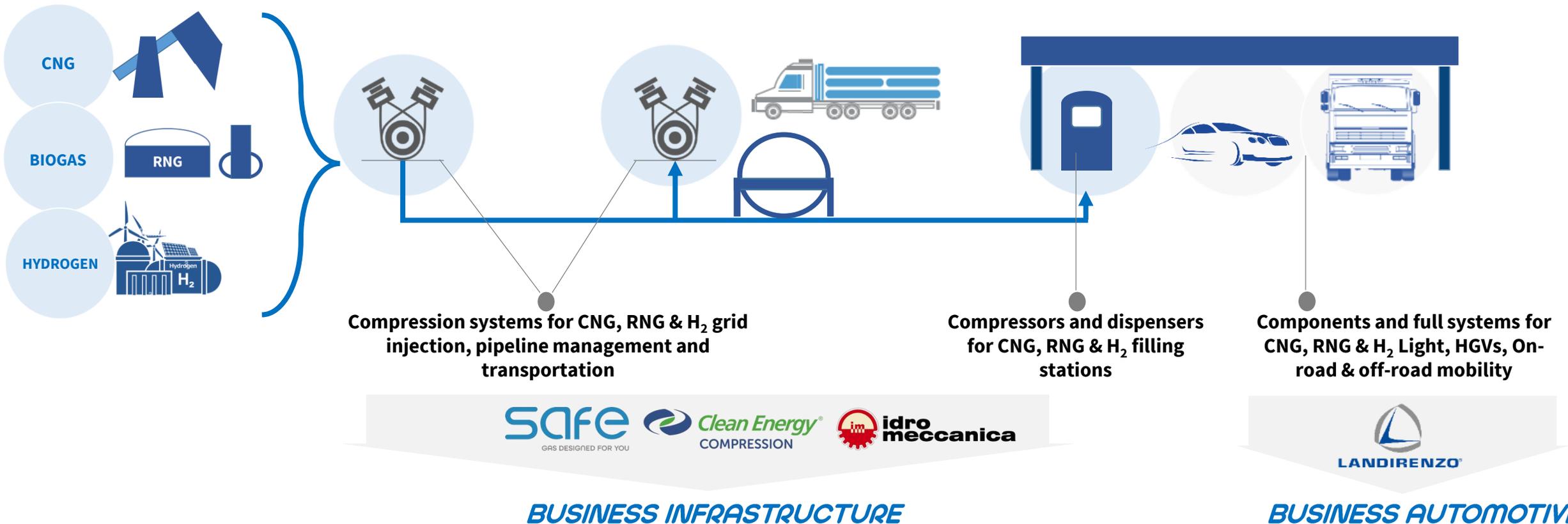
Fostering energy transition

... through the entire value chain

Post-generation

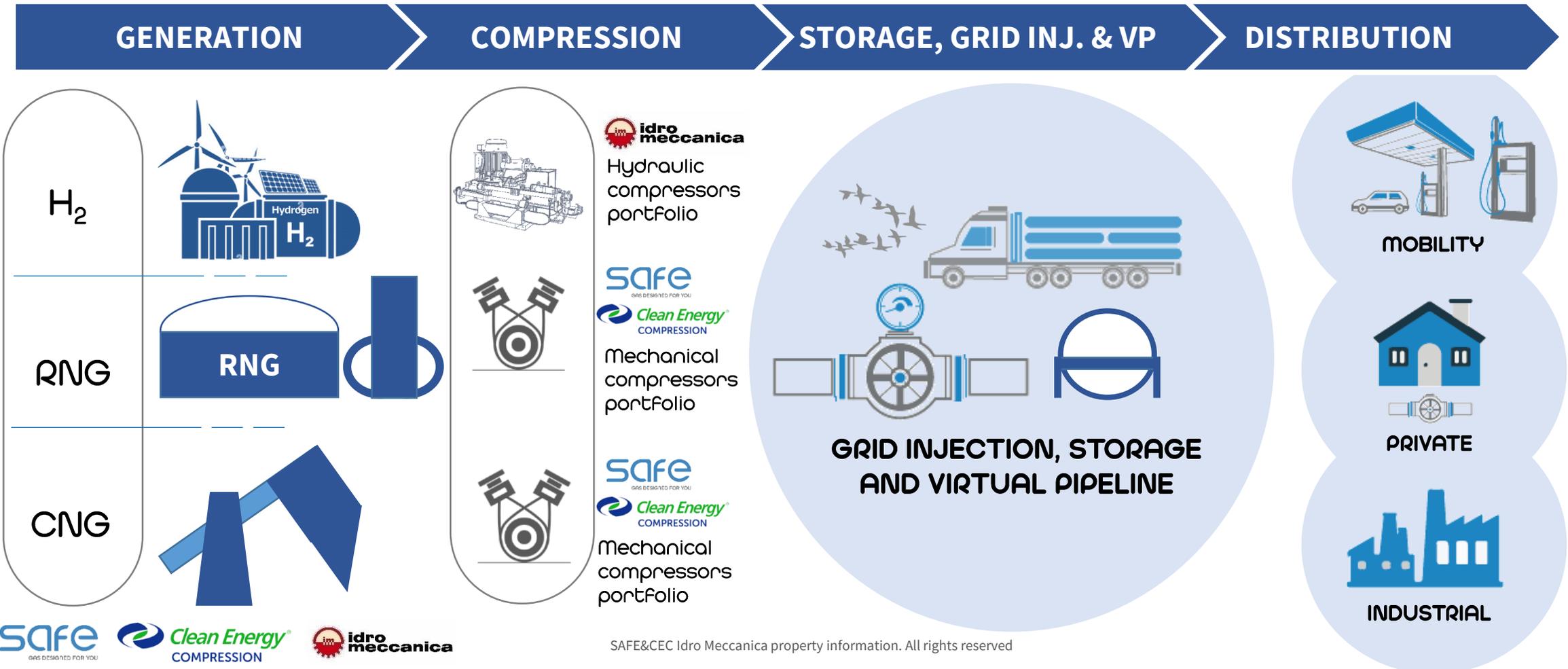
Transportation

CNG, RNG, H₂ Mobility



Clean technology solutions

We foster energy forward through the use of compression/decompression systems along the entire infrastructure energy value chain. With our expertise and know-how we provide our Customers with cutting-edge solutions able to handle any type of gas: Hydrogen, biomethane, natural gas and syngas



Offering

The Group offers a wide range of technologies that are translated into an integrated **product and service portfolio**

From **highly customized** to **standardized** and integrated solutions developed with Customer;

Innovation driven by **technical experience** in Compression: Water cooling, high speed & low speed compressors with direct coupling;

Worldwide presence to ensure **localization**. We operate in Europe, Middle East, Russia & CIS, Asia & Pacific, North and Latin America.

We bring a comprehensive set of competences, skills, and product offering, with global capabilities

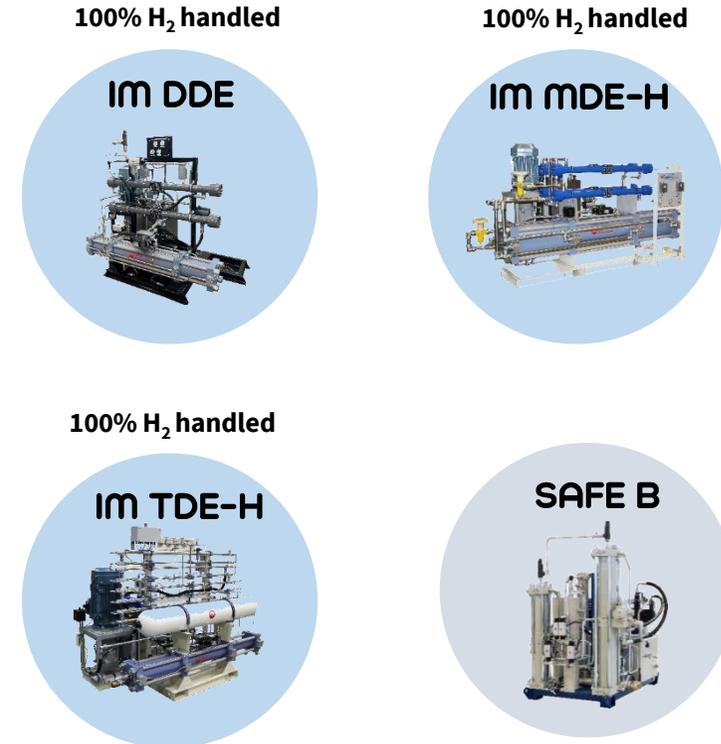


Our CORE Product Portfolio

Reciprocating mechanical compressor series



Hydraulic compressor series



We offer a wide range of compressors which can be integrated in a complete system according to Customer's requirements

Group capabilities in H₂

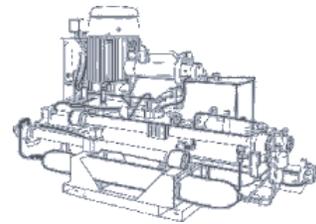
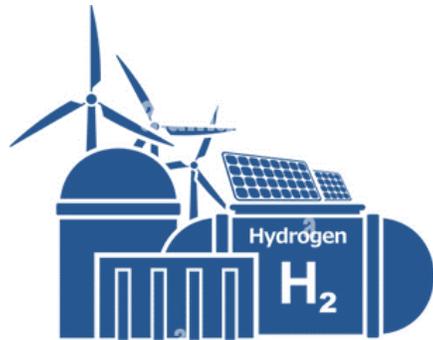
Clean technology solutions: Hydrogen

GENERATION

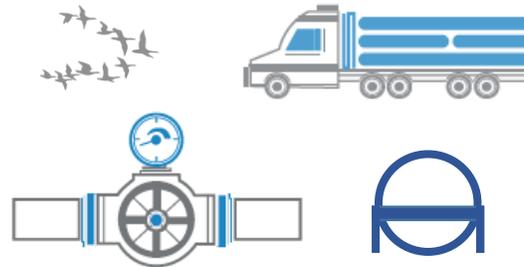
COMPRESSION

STORAGE, GRID INJ. & VP

DISTRIBUTION



Max discharge pressure:
500 bar (7,250 psi)



GRID INJECTION, STORAGE AND
VIRTUAL PIPELINE



MOBILITY

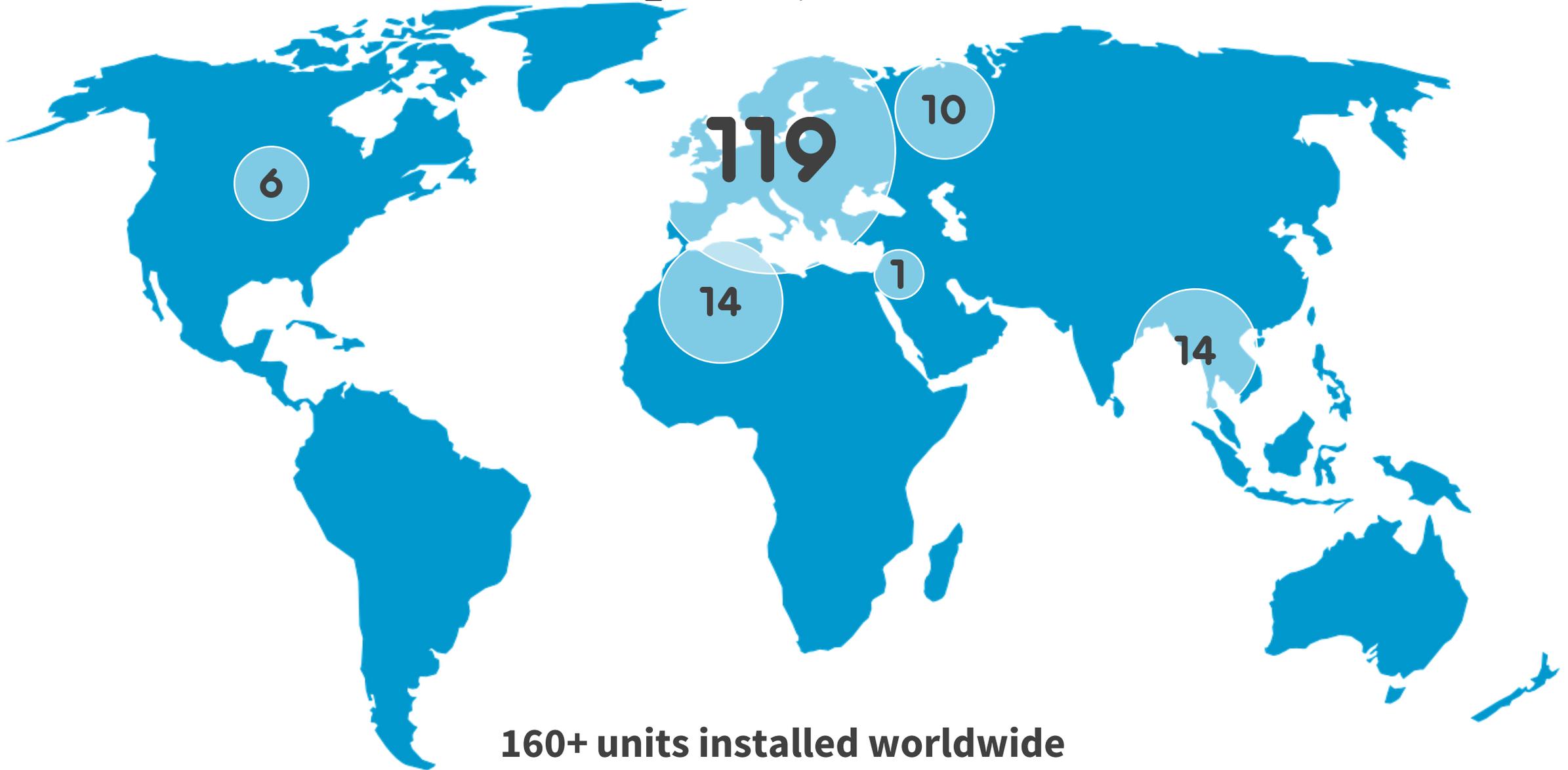


PRIVATE



INDUSTRIAL

Our references in H₂ compression



160+ units installed worldwide

Idro Meccanica hydraulic compressors

Based on a hydrostatic transmission, they are featured by one hydraulic cylinder and two gas cylinders. A steel rod connects the oil piston with two gas pistons. The pressure of the oil on the oil piston moves the connecting rod and gas is compressed in the gas cylinders by the gas pistons. The only moving part is the connecting rod.

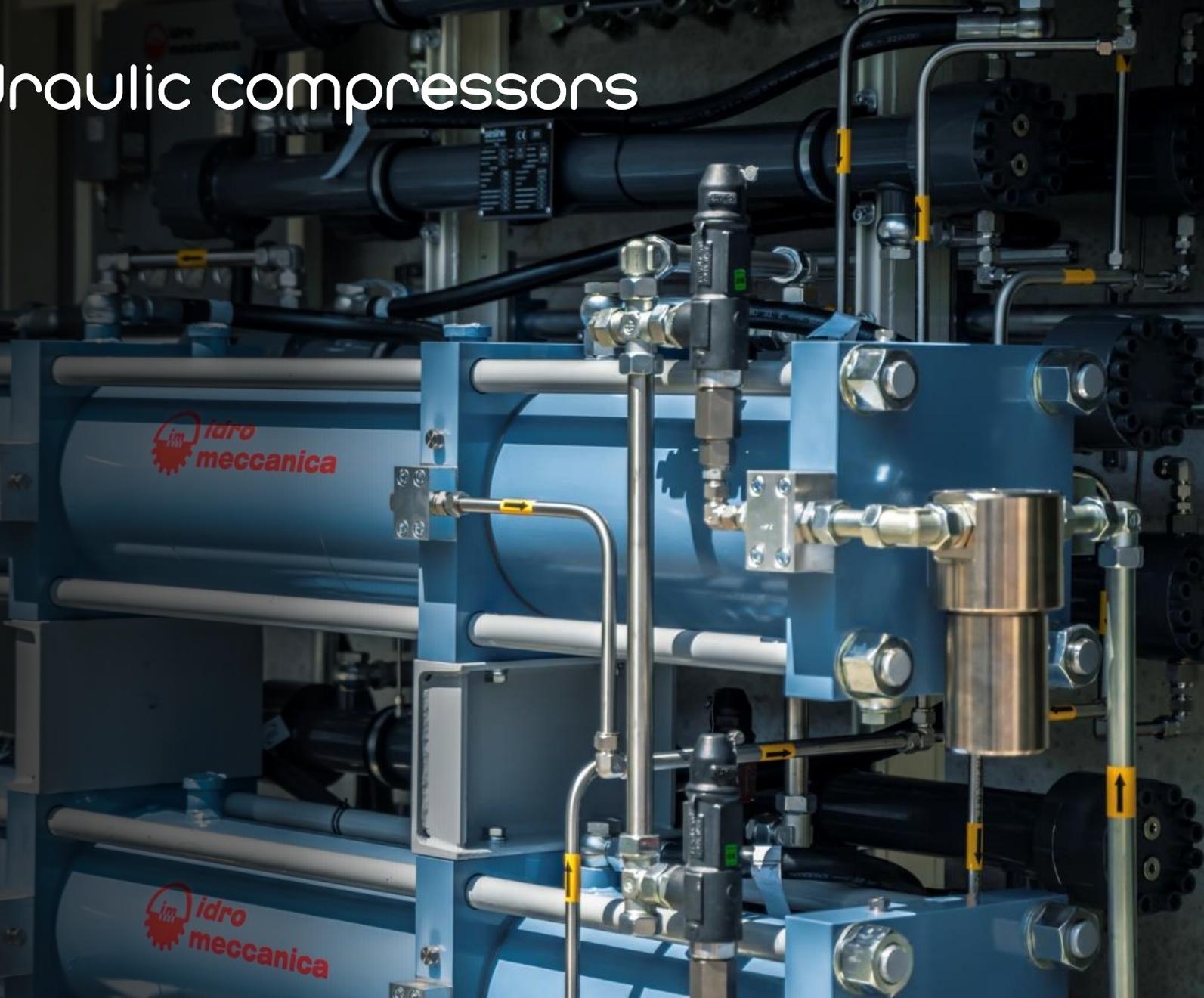
The compressors are water-cooled.

All gas seals are made of a special PTFE (Teflon) self-lubricating compound and the gas cylinders are non-lubricated.

The inlet and outlet valves of each stage of the compressor are check-valves that require no maintenance at all.

All electrical apparatus on the compressor are designed to be used in a Z2 (Z1 upon request) hazardous area. The electric motors are explosion-proof and all instruments are intrinsically safe fed.

The units are supplied mounted on a steel frame. There is no need of foundations; the units could be placed on the existing floor.



... And strengths

AVAILABILITY & RELIABILITY

Low speed results in +20 years service life. Wear parts, such as gas seals, are self-lubricating PTFE-based and have an average life of 5,000 operating hours.

EFFICIENCY

The wide range of pressures and the very low power consumption - thanks to the low speed range - make our compressors the ideal solution delivering high efficiency and low TCO.

FLEXIBILITY

Hydraulic compressors are relatively simple with only one moving part: the piston rod to which the oil and gas pistons are attached.

GREEN

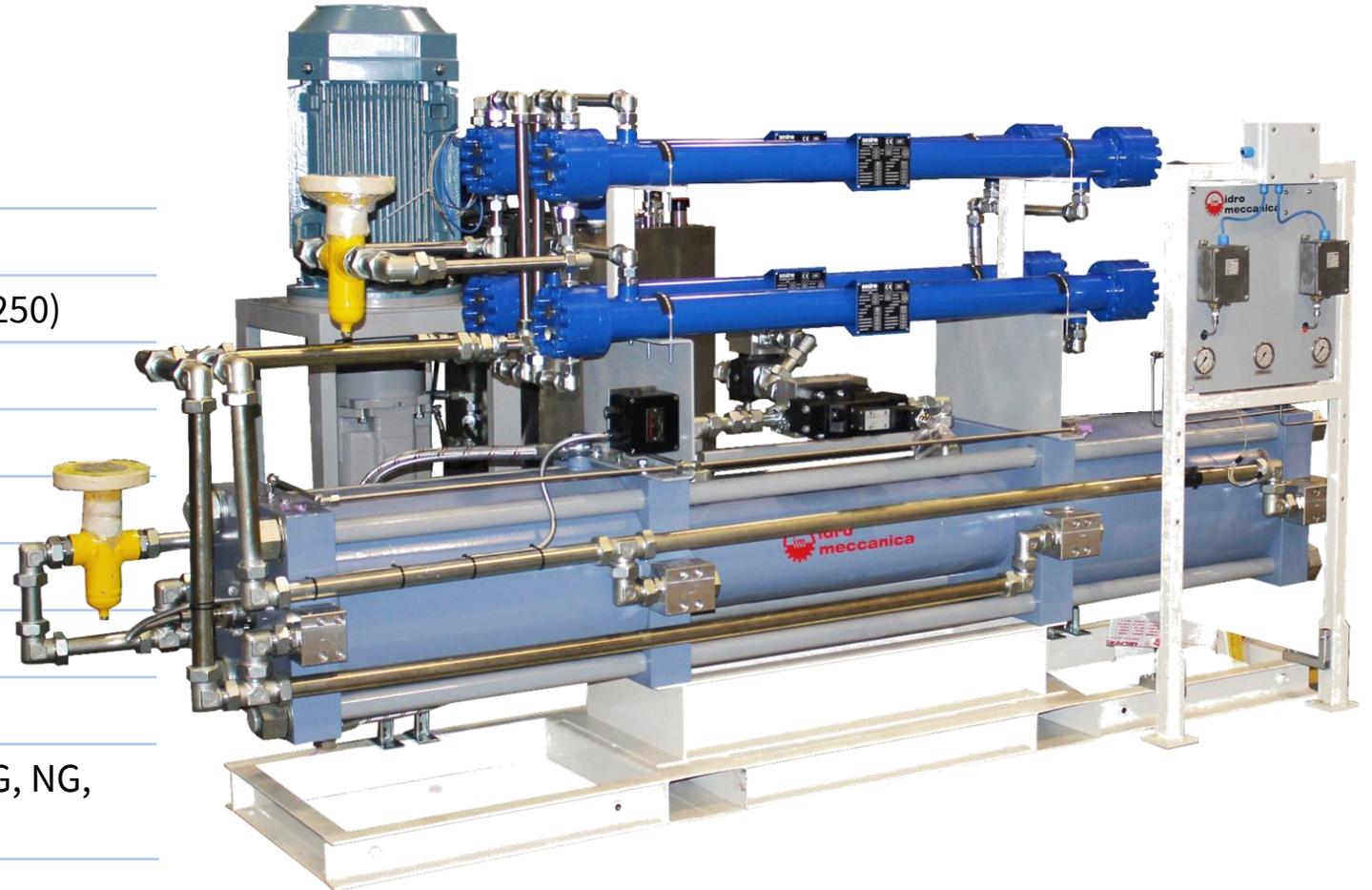
The new generation features a "Long Distance Piece" (LDP) that prevents any gas contamination.



MDE-H single stage series datasheet

The Ideal solution for high pressure **high-flow rate applications** and **grid injection**

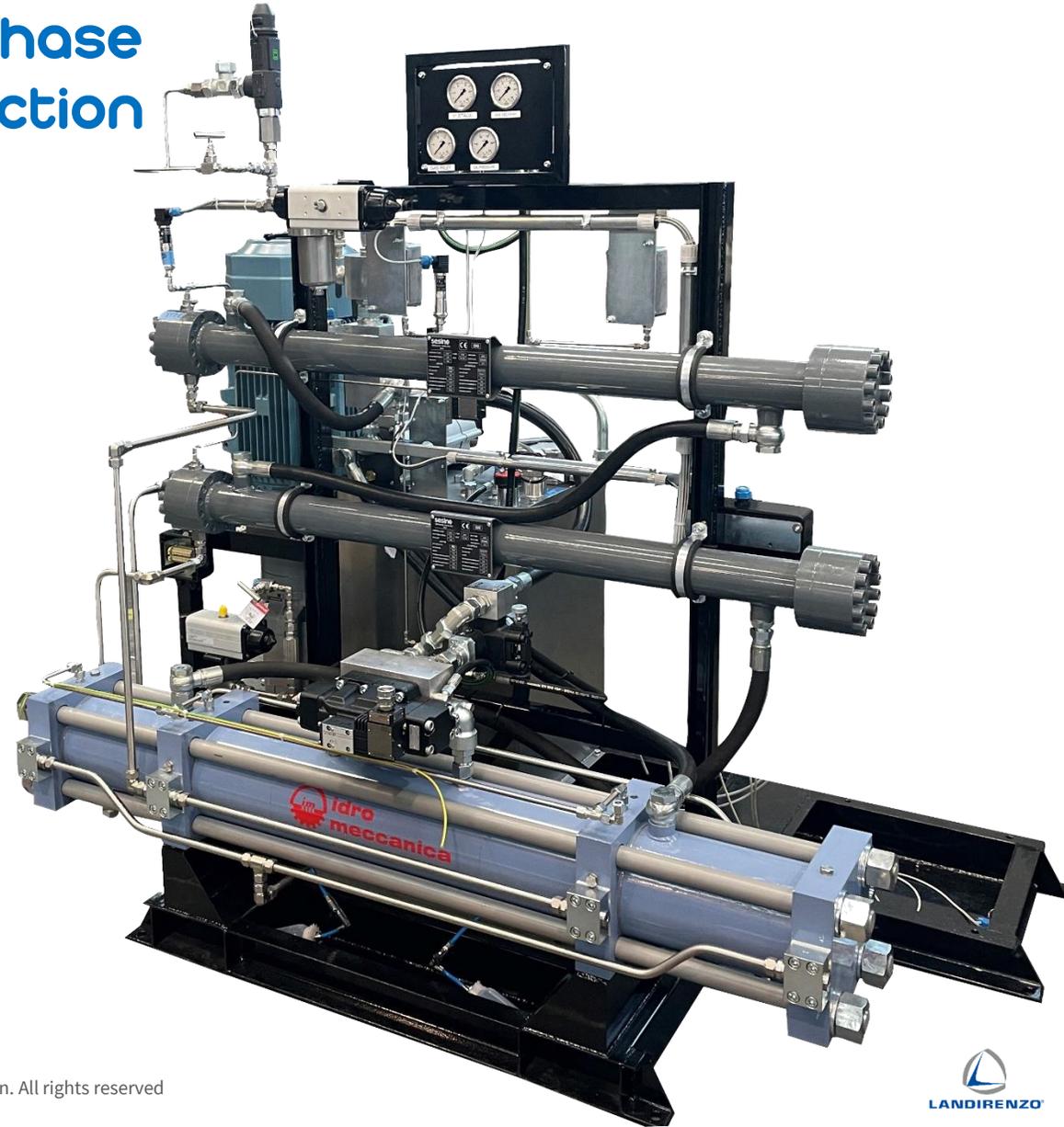
Cylinder	No.	2
Stages	No.	1
Suction pressure	bar (psi)	4 ÷ 500 (58 ÷ 7,250)
Discharge pressure	bar (psi)	500 (7,250)
Max flowrate	Ncm/h (SCFM)	3,500 (2,065)
Power	kW (Hp)	75 (100)
Max speed	rpm	80
Maintenance	hours	5,000
Configuration	-	Single or twin
Gas handled	-	Hydrogen , RNG, NG, Syngas



DDE two-stages series datasheet

Generally used in a **first compression phase**
From the **H₂ generator** and for **grid injection**

Cylinder	No.	2
Stages	No.	2
Suction pressure	bar (psi)	14 ÷ 280 (203 ÷ 4,060)
Discharge pressure	bar (psi)	280 (4,060)
Max flowrate	Ncm/h (SCFM)	2,000 (1,180)
Power	kW (Hp)	75 (100)
Max speed	rpm	80
Maintenance	hours	5,000
Configuration	-	Single or twin
Gas handled	-	Hydrogen , RNG, NG, Syngas



TDE-H three-stages series datasheet

The ideal solution for **daughter stations** and **direct filling**

Cylinder	No.	2
Stages	No.	3
Suction pressure	bar (psi)	3 ÷ 500 (43.5 ÷ 7,250)
Discharge pressure	bar (psi)	500 (7,250)
Max flowrate	Ncm/h (SCFM)	1,500 (885)
Power	kW (Hp)	75 (100)
Max speed	rpm	80
Maintenance	hours	5,000
Configuration	-	Single or twin
Gas handled	-	Hydrogen , RNG, NG, Syngas



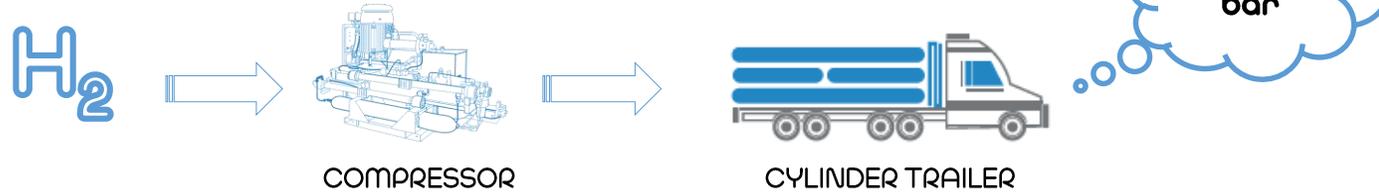
The perfect solution along the H₂ value chain

Our compressors are the best choice along the entire **HYDROGEN value** chain, from production to distribution. They can serve the following applications.

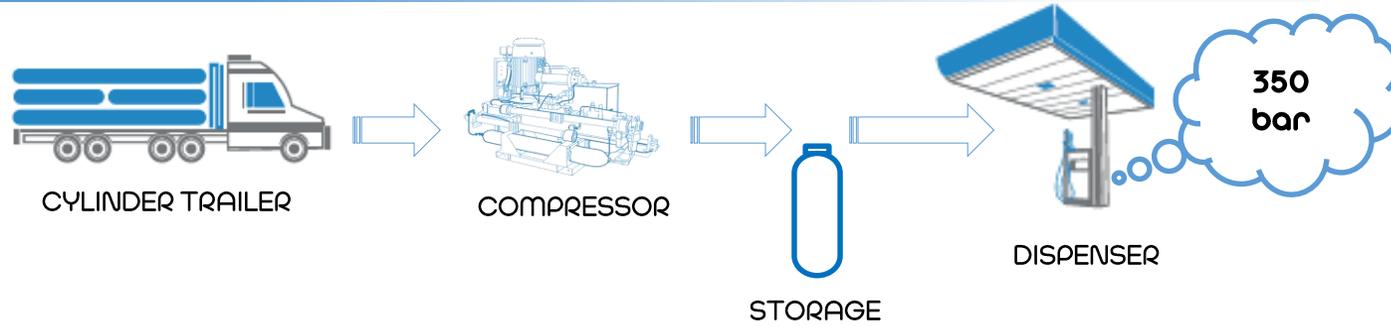
APPLICATIONS	PRESSURE RANGE (bar)	PRESSURE RANGE (psi)
H2 industrial use	from 4 to 250	from 58 to 3,625
Grid injection & cylinder trailer refilling	from 75 to 500	from 1,088 to 7,250
H2 industrial production	up to 500	up to 7,250
H2 refilling stations	up to 500	up to 7,250

The high flexibility of our compressors allows to fit the entire system to customer's requirements, selecting the best solution in terms of efficiency and performance with **highly competitive OPEX** and **CAPEX**. Our goal is to offer **carbon-free, environmentally friendly**, highly **available** and **reliable** solutions with **low operating costs**.

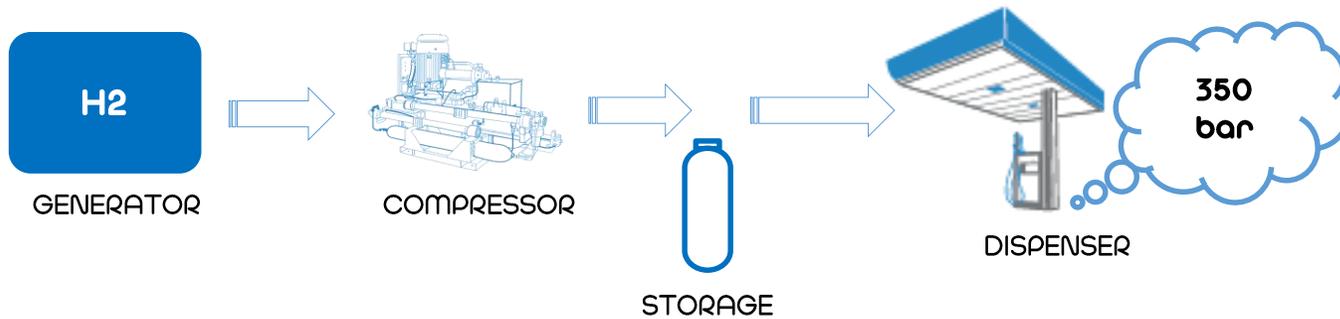
Some H₂ plant layouts



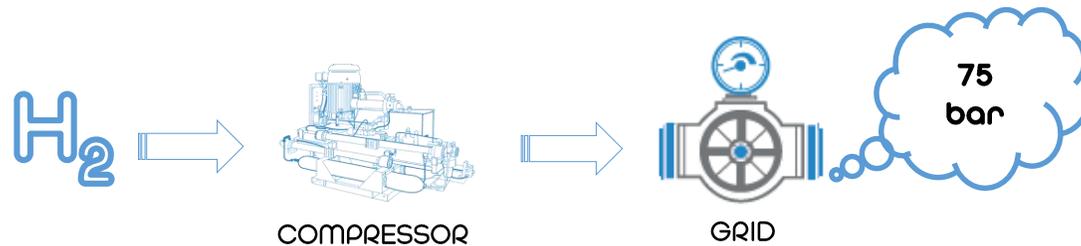
1 MOTHER STATION



2 DAUGHTER STATION



3 STATION WITH ON-SITE GENERATION



4 GRID INJECTION

Some references in H₂

H₂ grid injection Germany

APPLICATION	-	GRID INJECTION
COMPRESSOR SERIES	-	DDE
COMPRESSOR MODEL	-	DDE26.225.150
CONFIGURATION	-	Single
SUCTION PRESSURE	bar (psi)	8 (116)
DISCHARGE PRESSURE	bar (psi)	Up to 75 (1,088)
FLOWRATE (@ 8 P in)	Ncm/h (SCFM)	250 (147.5)
COMPRESSOR SUPPLIED	No.	1
EM POWER	Kw (Hp)	37 (50)

H₂ generation Denmark

APPLICATION	-	H ₂ GENERATION
COMPRESSOR SERIES	-	TDE/H
COMPRESSOR MODEL	-	TDH13.160.90.75
CONFIGURATION	-	Twin
SUCTION PRESSURE	bar (psi)	30 (435)
DISCHARGE PRESSURE	bar (psi)	350 (5,075)
FLOWRATE (@ 30 P in)	Ncm/h (SCFM)	120 (70.8)
COMPRESSOR SUPPLIED	No.	1
EM POWER	Kw (Hp)	22 (29.5)
ELECTROLYZER	Kw (Hp)	500 (670)



H₂ Filling station Italy

APPLICATION	-	H ₂ FILLING STATION
COMPRESSOR SERIES	-	TDE/H
COMPRESSOR MODEL	-	TDH85.120.75.50
CONFIGURATION	-	Single
SUCTION PRESSURE	bar (psi)	6-9 (87-130.5)
DISCHARGE PRESSURE	bar (psi)	360 (5,220) *
FLOWRATE (@ 9 P in)	Ncm/h (SCFM)	9 (5.3)
COMPRESSOR SUPPLIED	No.	1
EM POWER	Kw (Hp)	5.5 (7.4)

* Potentially up to 450 bar (6,525 psi)

Our growth plan in H₂

H2 path

DEVELOPMENT AND LAUNCH OF:

the second line of **mechanical hydrogen compressors (ST series)**

Launch of **1MW hydrogen horizontal compressor**

2023

DEVELOPMENT AND LAUNCH OF:

the first line of **mechanical hydrogen compressors (SV/SW series)**

the first line of **hydrogen dispensers** ✓

the first line of **hydrogen dryers**

2022

Test campaign on current **mechanical compressor line:**
gas handled ... natural gas with **20% H2** ✓

100% H2 Hydraulic compressors line product offering
with up to 1,000 barG discharge pressure ✓

2021



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COMPRESSION



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