

MACHINES

ISO 9001:2015 CERTIFIED QUALITY MANAGEMENT SYSTEM

DIAPHRAGM COMPRESSORS

SIMPLEFUEL STATIONS

HYDROGEN REFUELING STATIONS (HRS)



Our Solution: UPTIME

THAT'S WHAT OUR CUSTOMERS DEMAND. THAT'S WHAT WE DELIVER.

Meet PDC Machines. We are an equipment manufacturer in Eastern Pennsylvania, USA serving the hydrogen energy and industrial gas markets. Since 1977, our products have been synonymous with heavy duty operation, rugged design, and extended uptime for long-term reliability around the world. Our solutions are based on these three staples:

We perform under pressure.

DIAPHRAGM COMPRESSORS

Bare units to complete skids with piping, automated controls and instrumentation.

SIMPLEFUEL STATIONS

Production, compression, storage, dispensing.
Small package. Small setbacks.

HYDROGEN REFUELING STATIONS (HRS)

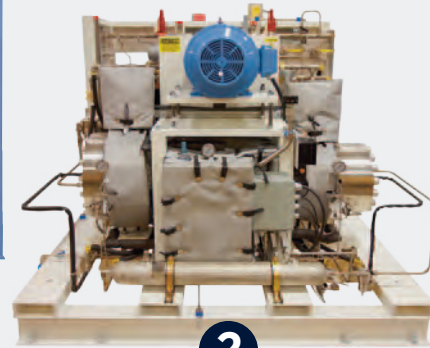
Designed and configured for your fleet vehicles fueling profile.

DIAPHRAGM COMPRESSOR

PRODUCT FAMILY



1



2



3

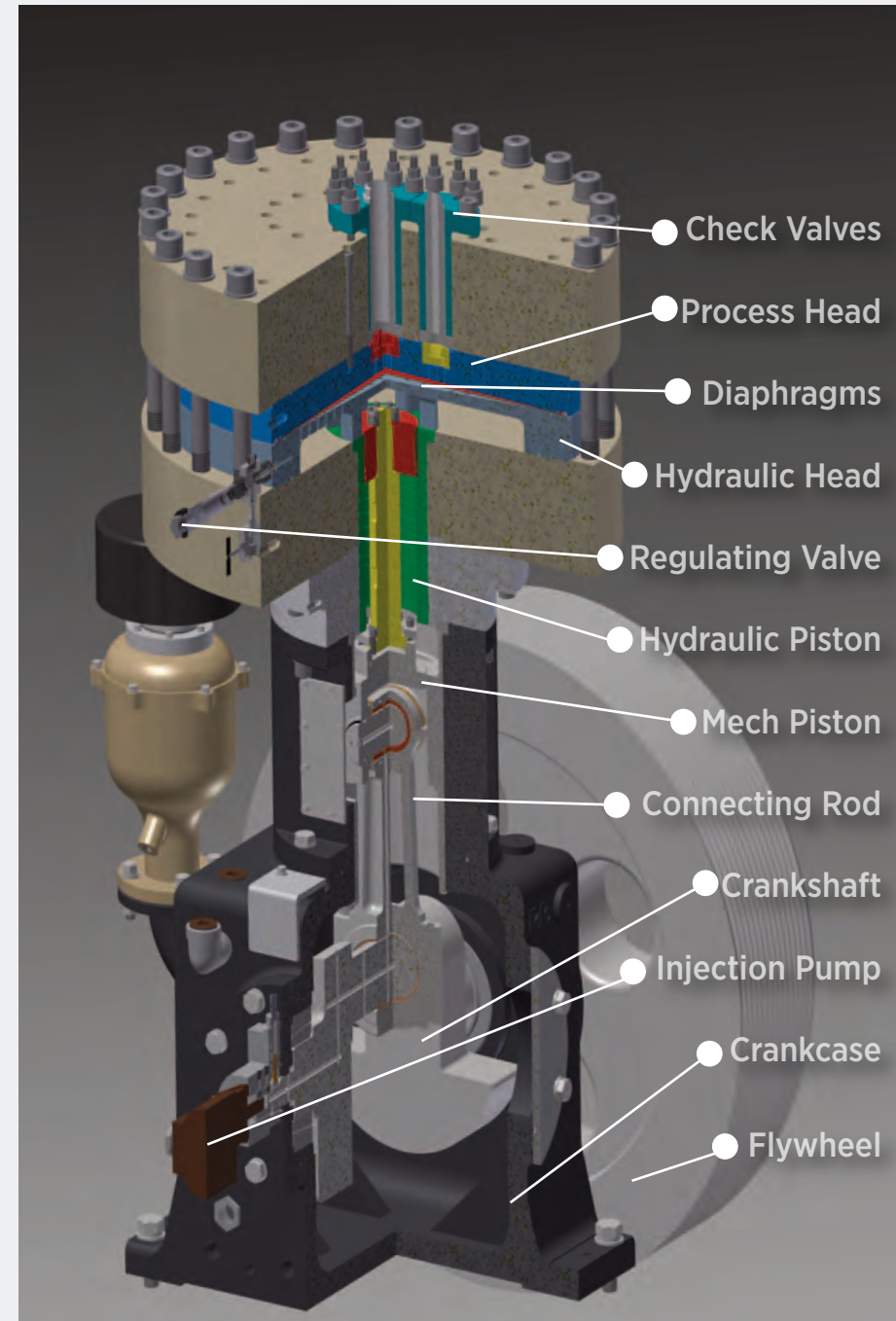


4

- 4 compressor crankcase options with associated heads
- All compressor options are capable of suction pressures from atmospheric to 1,000 barg.
- Greater flow capacity with crank size, rod load, and head diameter

Example: H₂ gas, 30 bar in, 500 bar out

- 1 **PDC-13 — 1000 kg/day**
15' L x 8' W (4.5 x 2.4 M)
- 2 **PDC-4(150) — 115 kg/day**
6.5' L x 6.5' W (1.9 x 1.9 M)
- 3 **PDC-4(100) — 70 kg/day**
6' L x 6' W (1.8 x 1.8 M)
- 4 **PDC-3 — 50 kg/day**
3' L x 3' W (1 x 1 M)



POSITIVE DISPLACEMENT MACHINE

HYDRAULIC SYSTEM

- Crankshaft driven by electric motor
- Reciprocating piston
- Hydraulic piston energizes diaphragm movement
- Hydraulic oil regulating valve

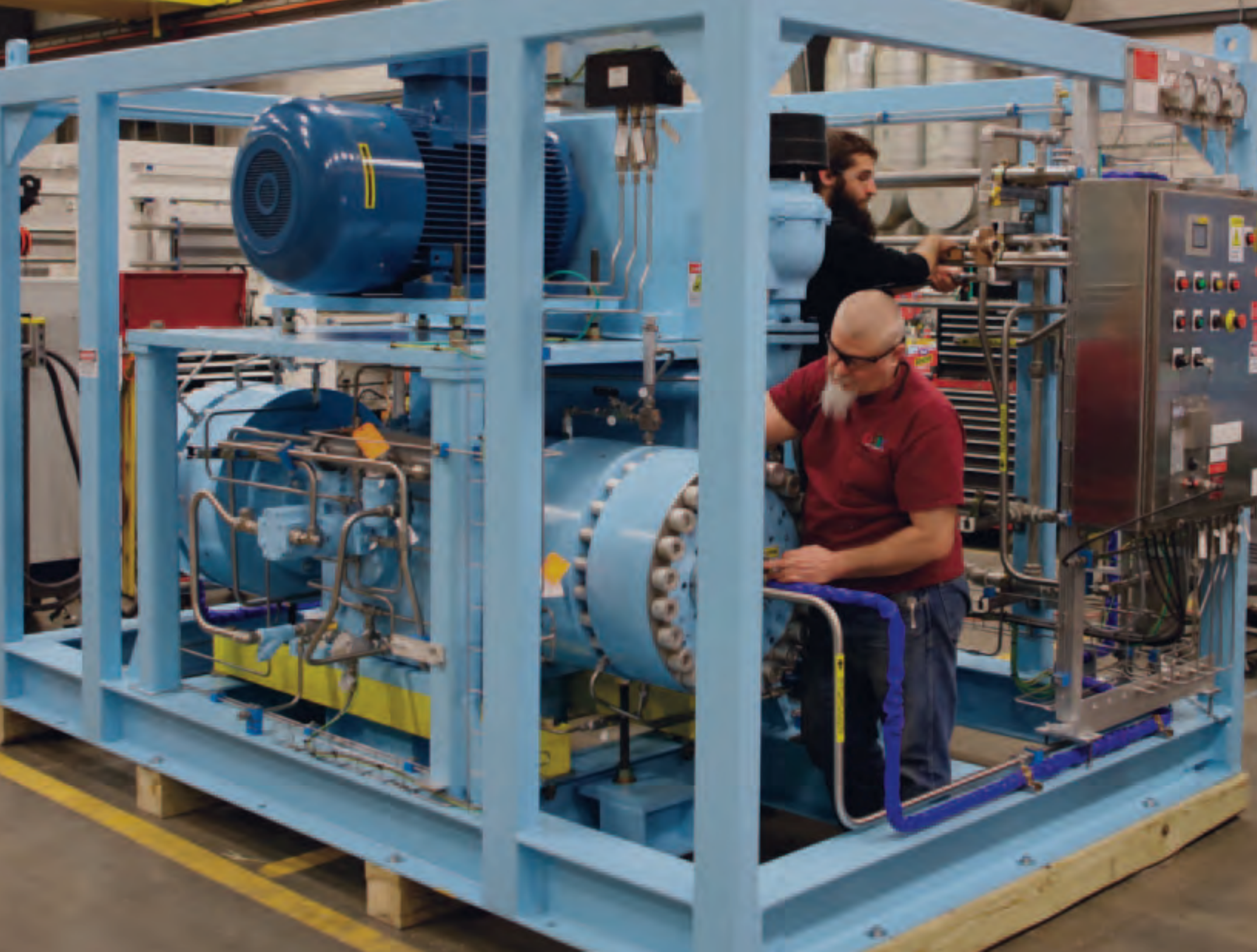
COMPRESSION SYSTEM

- Gas head assembly
- Triple Diaphragm set
- Check valves

DIFFERENTIATORS

- Non-contaminating (oil separated from process gas)
- Leak-free
- Energy efficiency (no dynamic seals)
- Low maintenance

WHAT IS A DIAPHRAGM COMPRESSOR



VERY HIGH DISCHARGE PRESSURES

Up to 1034 bar (15,000 PSI)

NON-CONTAMINATING COMPRESSION

Gas is completely isolated from the hydraulic system to replace diaphragm leak detection system

MAXIMUM UPTIME

Reliable operation

LEAK FREE GAS COMPRESSION

Static seals and environmentally safe

INDUSTRY-LEADING ENERGY EFFICIENCY

Low energy costs

LOW MAINTENANCE COSTS

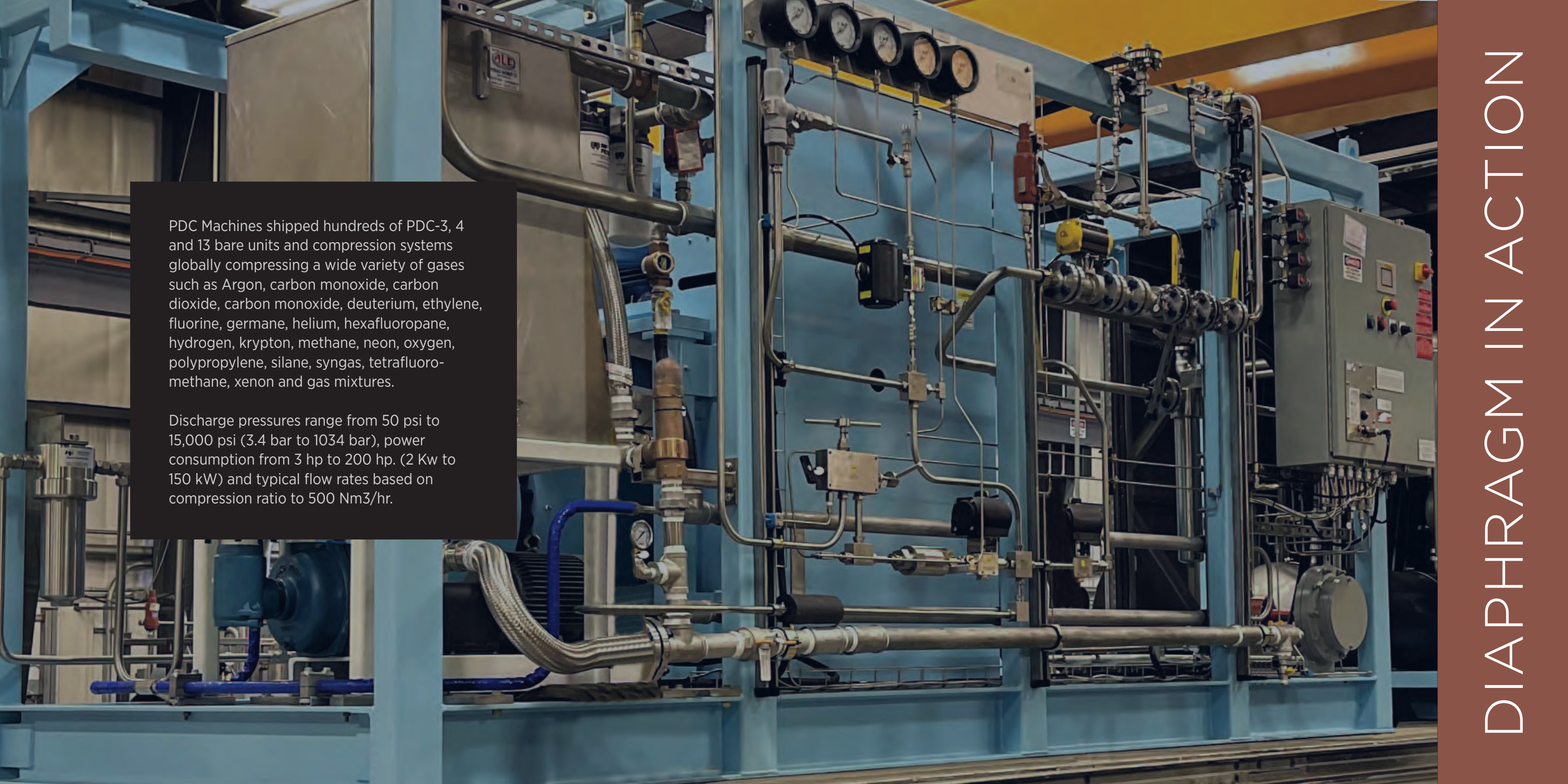
4,000 to 8,000 hr head maintenance intervals

FLEXIBLE OPERATION

Variable suction pressure

LONG TERM PERFORMANCE

20+ year life



PDC Machines shipped hundreds of PDC-3, 4 and 13 bare units and compression systems globally compressing a wide variety of gases such as Argon, carbon monoxide, carbon dioxide, carbon monoxide, deuterium, ethylene, fluorine, germane, helium, hexafluoropane, hydrogen, krypton, methane, neon, oxygen, polypropylene, silane, syngas, tetrafluoromethane, xenon and gas mixtures.

Discharge pressures range from 50 psi to 15,000 psi (3.4 bar to 1034 bar), power consumption from 3 hp to 200 hp. (2 Kw to 150 kW) and typical flow rates based on compression ratio to 500 Nm³/hr.

H2 STORAGE

4.8 kg
2-hr firewall

H2 VALVE PANEL

Flow control

CONTROL PANEL

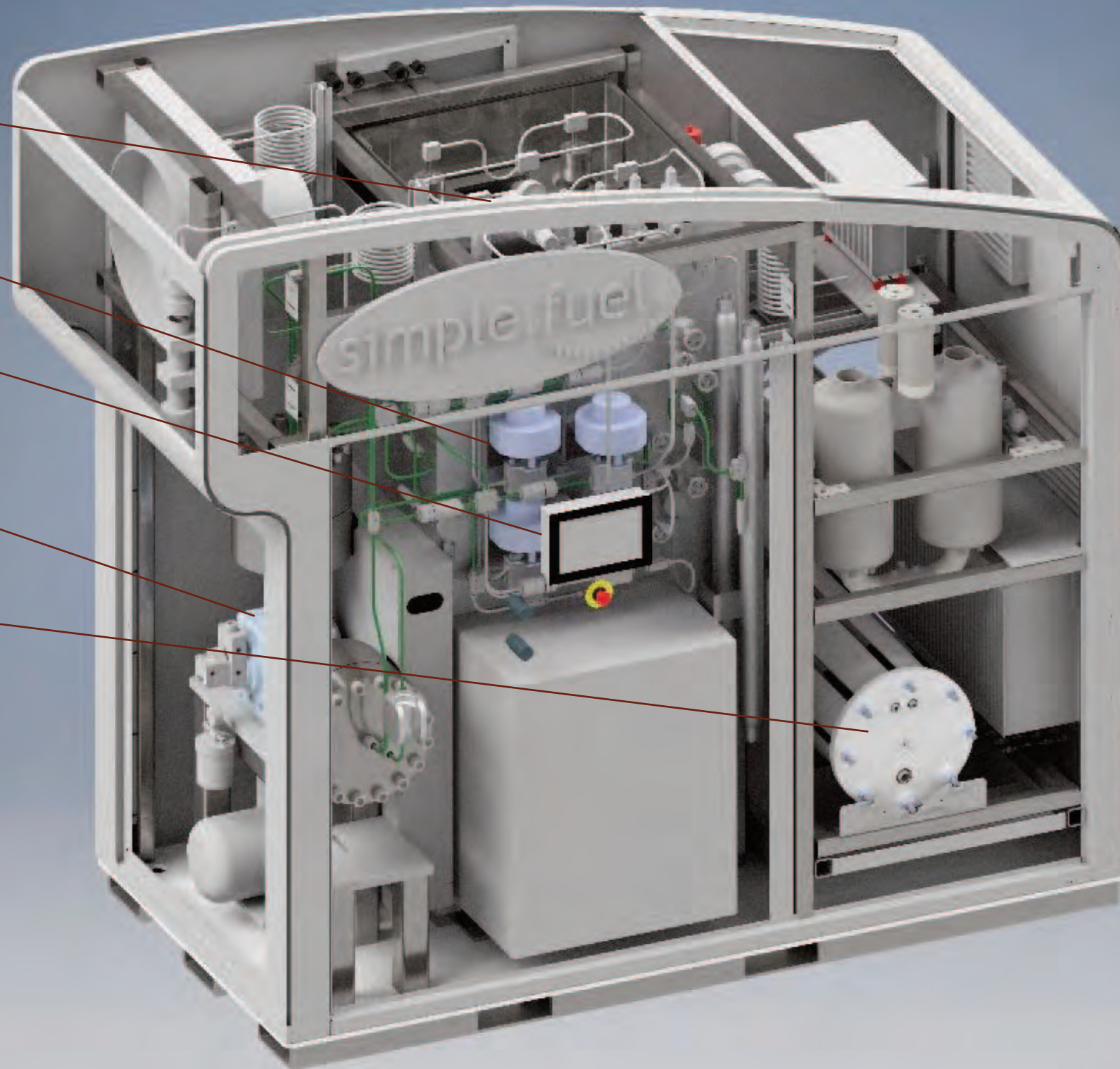
PLC
Remote monitoring

COMPRESSOR

H2 to 350-700 bar

ELECTROLYZER STACK

20 kg/day



simple.fuel.®

your on-site hydrogen fueling solution

MINIMAL SETBACKS

Adjacent to building

MOVED EASILY

Plug and play

STANDARDIZED PRODUCT

NFPA (US)
IECEX (Australia)
PED/ATEX/CE (Europe)
KHK (Japan)

SIMPLIFIED PERMITTING

Factory 3rd party certification

WHAT IS SIMPLIFUEL

AFFORDABLE HYDROGEN FOR SMALL SCALE APPLICATIONS

PROBLEM

At low volume, traditional H₂ supply methods are highly expensive (e.g., tube trailer / dispenser)

IMPACT

Small operations do not have affordable options to enable fuel cell usage:

Fuel cell usage

- Forklift fleets (20 trucks)
- Small car fleets (10-20 cars)

SOLUTION

- Scalable for evolving demand
- 10-20 kg/day
- Drop-in installation, small footprint



WHY SIMPLEFUEL



Photo Credit: Toyota Industries Corporation (TICO) Takahama Factory, Aichi Prefecture, Japan



Customer:

Toyota Industries Corporation (TICO)

Location:

Takahama Factory, Aichi Prefecture, Japan

Application:

Hydrogen fueling for forklifts in industrial vehicle manufacturing plant.

Photo Credit: Toyota Industries Corporation (TICO) Takahama Factory, Aichi Prefecture, Japan

WHY HRS

Our HRS is made up of compression, storage, chilling dispenser, safeties, controls, and factory certification.

CUSTOMIZABLE

Designed and configured for your specific vehicle fleet

SCALABLE

Grows with your fleet's future needs

ADAPTABLE

Accepts any source of hydrogen (electrolyzer, tube trailer, reformer, etc.)

RANGE OF DISPENSING PERFORMANCE

350 bar Medium Duty/Heavy Duty or
700 bar Light Duty
T20, T40 fills per SAE J2601 fueling protocol

ADVANCED CONTROLS

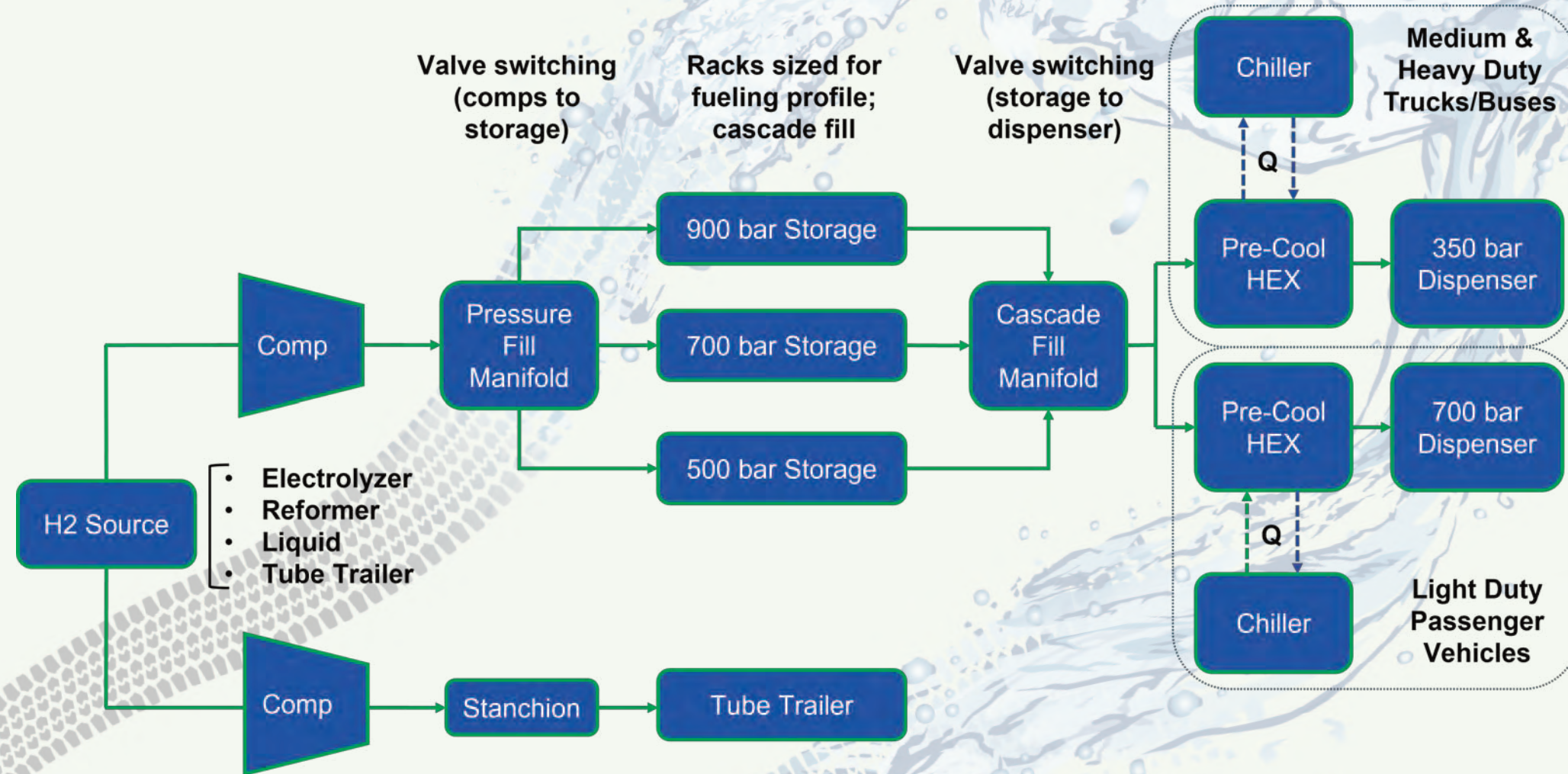
Remote monitoring and diagnostics
Complete controls for autonomous operation

COMPREHENSIVE SAFETIES

IR detectors, head detectors, flammable gas detectors, and PSV

EXPEDITES PERMITTING

Factory certification to local codes and standards



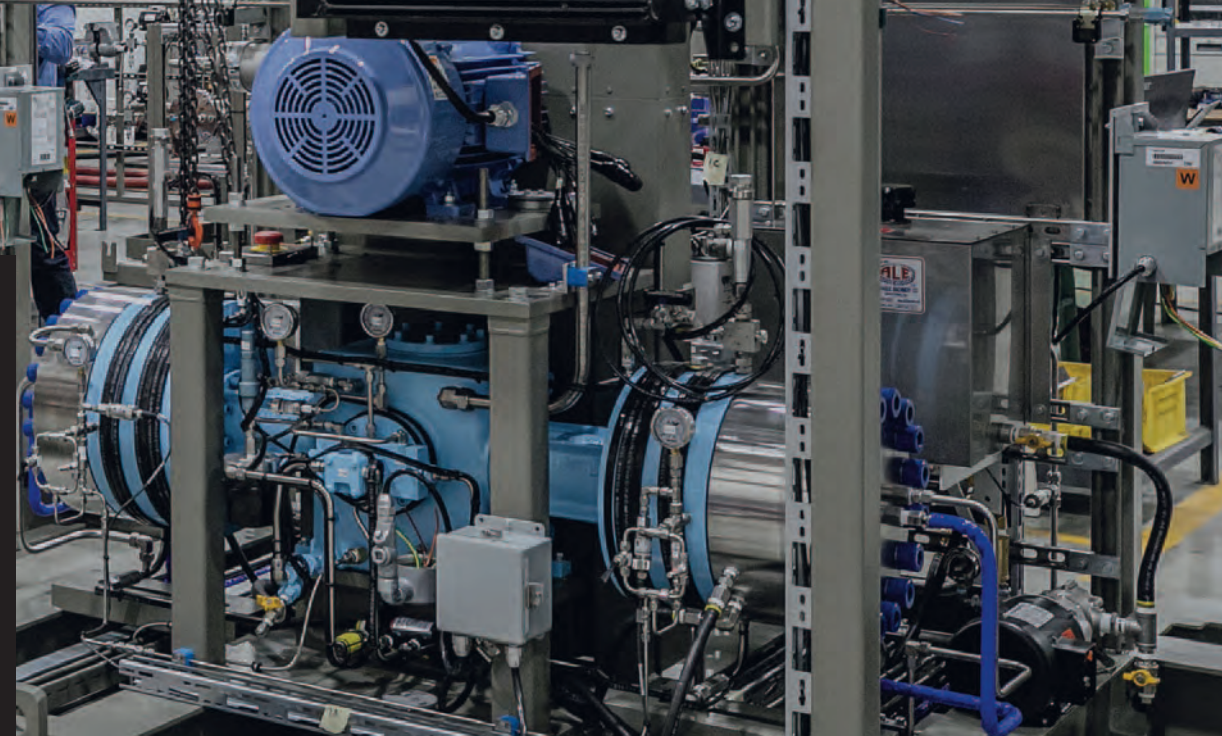
CHAMPAIGN-URBANA MASS TRANSIT DISTRICT (CUMTD)

PDC Machines and Ivys Energy Solutions are deploying a Hydrogen Refueling Station at the Champaign-Urbana Mass Transit District (CUMTD) in Illinois.

This MW scale hydrogen station will fuel a fleet of 12 New Flyer 60' zero-emission fuel cell electric buses. The hydrogen infrastructure solution includes compression, storage, chilling, dispensing, safeties, and controls.

PDC and Ivys designed and manufactured the HRS to efficiently phase in buses. In Phase 3, each of the 12 buses will be fueled back-to-back with 35 kg within 14 minutes per fill.

This highly aggressive fueling profile results in 420 kg of total dispensed hydrogen within a 3 hour period. The HRS takes hydrogen produced from a MW-scale PEM electrolyzer and dispenses to the buses at 350 bar pressure at 20 degrees C temperature for a T20 fast fill. Additionally, the modular HRS design allows for future growth.

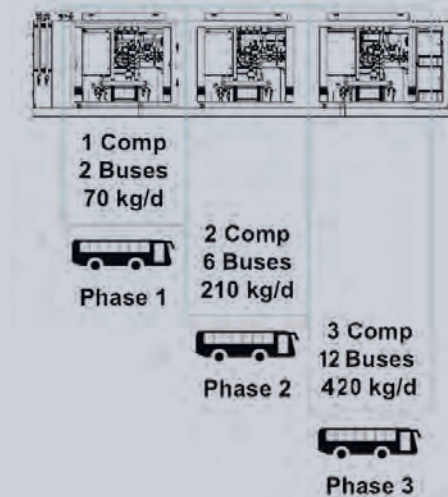


FAST FILLS

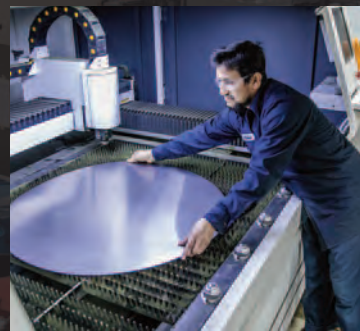
12 buses in 3 hours
35 kg in 10-14 mins

GROW WITH BUS FLEET

Phased approach
Redundancy on common skid
Scaling with efficiency



HRS IN ACTION



BACKGROUND

Founded 1977

2nd generation, family-owned

Local sourcing

MANUFACTURING

90,000 sq. ft., > 20 CNC

ISO 9001:2015 certified

SERVICE

Best-in-class global field service

Inventory / quality OEM spare parts

available direct from PDC

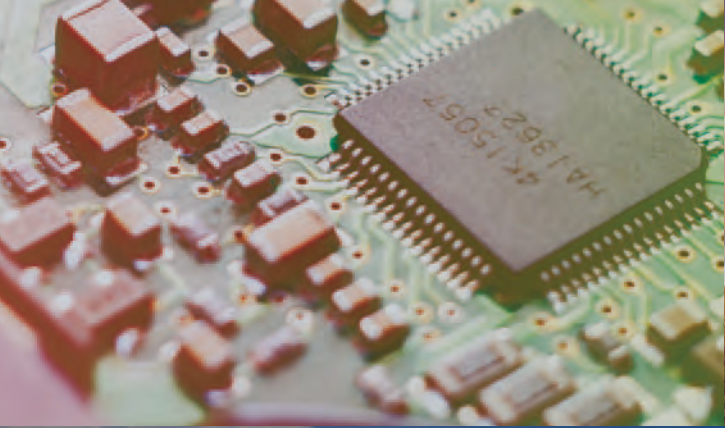
EXPERIENCE

> 4700 compressors installed

> 500 for H2 energy

> 50 Hydrogen Refueling Stations

WHO WE ARE



HYDROGEN ENERGY

Mobility stations for trucks, buses, cars, forklifts, trains, etc.

Power-to-gas to store or transport renewable energy

Injection to natural gas pipeline for decarbonization

INDUSTRIAL GAS

Petrochemical (Oil & Gas)

Chemical

Specialty Gas

Power Generation

Pharmaceutical

Semiconductor

Food & Beverage

Research & Development

WHAT WE DO



Our equipment is backed by a veteran team of engineers, factory assemblers and service technicians, providing a local presence to ensure maximum uptime of our customers' operations.

PDC Machines has offices in North America, Europe, China, Japan, and Korea. We also have partner offices in Australia, Middle East, and many locations around the world.

HOW WE SERVE YOU

Hydrogen Generation



Gas Compression



Station Developer



Hydrogen Mobility



WHO WE SERVE

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M A C H I N E S

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