Diaphragm Compressors

Designed and Constructed for High Reliability and Low Maintenance
Providing World-Class Diaphragm Compressors

This is accomplished through a unique combination of:

**In-House Engineering and Design**

PDC’s engineers utilize the latest engineering software and our own customized software packages to shorten the delivery cycle and increase productivity. We design our compressor systems to comply with local and international codes and standards.

**Modern Manufacturing Facility**

PDC is committed to continuously improving its manufacturing process, utilizing the latest lean manufacturing techniques to streamline our operations, keep costs down, and decrease lead times. We utilize fifteen computerized, numerically controlled machining centers to easily perform the most complicated machining operations.

**Stringent Quality Control**

To ensure our products exceed our customer’s expectations, PDC is 9001:2008 ISO certified and adheres to a strict Quality Assurance/Quality Control program at each stage of the manufacturing process.
PDC Machines has been manufacturing diaphragm compressors since 1977. Today PDC is a 2nd generation family-owned and operated business that is rooted in innovation, business discipline and fair pricing with a deep commitment to our employees, clients, and the communities we serve. We have earned a reputation for delivering the highest quality compressors quickly at the lowest cost possible.

Model selection Guide

PDC-4-800(100%)-3000(100%)

PDC = Manufacturer
4 = Compressor Series, (-3, -4, -5, -13, -P)
800 = 1st head discharge pressure rating, (psig)*
(100%) = 1st head loading factor, (35 to 150%)**
3000 = 2nd head discharge pressure rating, (psig)*
(100%) = 2nd head loading factor, (35 to 150%)**

* If head pressure rating are equal, compressor is a single stage/duplex
** Loading factor does not have to be identical for both heads

Serving Many Industries

PDC Machines state-of-the-art diaphragm compressors are the preferred choice for any application where high purity and leak-tight compression are required. Our compressors are found in virtually every industry worldwide.

These include:
- General Industrial
- Specialty Gas
- Industrial Gas
- Alternative Energy
- Bio Gas
- Power
- Chemical Processing
- Petrochemical
- Oil and Gas Refining
- Universities and Research
- Government
- Pharmaceutical
- Food & Beverage
- Semiconductor Industry

Typical applications

Include any gas which may be hazardous, toxic, carcinogenic, explosive, environmentally damaging, pyrophoric, corrosive, rare or of high purity. Examples include Ar, CH2, CO2, CO, He, H2, H2S, Kr, NO, O2, N2, NF3, PH3, SiH4 and Xe.

Triple Metal Diaphragm benefits

- Leak free compression
- Non contaminating
- High compression ratios
- High discharge pressures
- Able to process corrosives gases
- High reliability

Integrated Assembly and Testing

A majority of our components are sourced within PDC, providing complete control over manufacturing, quality and delivery schedule, bringing ultimate value to our clients.

MACHINE S. C O M

Serving Many Industries
PDC Machines technology for use in Hydrogen energy and refueling

PDC Machines has long been a proponent of hydrogen as an energy carrier. Over the years we have partnered with gas producers, technology companies, research companies and component suppliers to create practical and commercial world-wide acceptance of this concept. PDC specializes in providing complete hydrogen compression solutions in hydrogen energy installations for fuel cell vehicles, buses and material handling vehicles. We offer an extensive line of standard compressors and turn-key designed compression systems to meet an array of applications ranging from single sites to full-scale commercial stations.

Vehicle Fueling:
A wide variety of models are available that can meet discharge pressures ranging from 3,500 psig to 15,000 psig (241 barg to 1,034 barg) and flow rates ranging from 5 kg/day to 2,500 kg/day and beyond.

Bus, Medium and Heavy Duty Truck Fueling:
Compressors are available that can meet discharge pressures up to 15,000 psig (1,034 barg) and flow rates beyond 2,500 kg/day.

Material Handling Vehicles:
PDC Machines compressors have been integrated into distribution infrastructures for fuel cell material handling equipment. Models are available to boost pressures to 7,000 psig (482 barg) and beyond and flow rates from 5 kg/day to 2,500 kg/day.

Component and Systems Integration:
With decades of experience in high pressure hydrogen compression systems, integration and process knowledge PDC is the preferred source for component and system packaging in hydrogen fueling applications.
**SimpleFuel Hydrogen generation and dispensing**

A consortium team of technology innovators comprised of PDC Machines, IVYS Energy Solutions and McPhy Energy, which make up SimpleFuel™, developed a cost effective and reliable fueling solution in order to make hydrogen fuel more accessible to fuel cell vehicle customers in the automotive, fleet and industrial sectors.

SimpleFuel™ is designed as an all-in-one hydrogen generation, compression, storage and dispensing solution capable of delivering up to 10 kg/day of hydrogen to vehicles at pressures up to 700 barg (10,150 psig). 5 kg of hydrogen fuel is enough to fill one fuel cell electric vehicle (FCEV) for 300-360 miles.
PDC-3-300-600 two-stage compressor, deuterium gas, Specialty Gas Industry, 30 barg/435 psig discharge pressure, 8 Nm3/hr flow rate, 7.5 kW/10 HP motor.

PDC-3-300-7500 two-stage compressor, helium gas, Industrial Gas Industry, 517 barg/7,500 psig discharge pressure, 20 Nm3/hr flow rate, 7.5 kW/10 HP motor.

Suction Pressure Range
Sub atmosphere and above

Discharge Pressure
Psig/Barg
Representative Transfill Applications: 6,000/413
Representative Industrial Applications: 6,500/482
Representative Hydrogen Energy Applications: 14,500/1,000

Flow Rate
Up to Scfm/ Nm3/hr: 30/48

Horse Power
Up to Hp/kW: 15/10
PDC-3-300-1000 two-stage compressor, tetrafluoroethylene (TFE) gas, Chemical Industry, 48 barg/700 psig discharge pressure, 10 Nm3/hr flow rate, 4 kW/5 HP motor.

PDC-3-550-550 (50) single-stage duplex compressor, silane gas, Semi-Conductor Industry, 9 barg/135 psig discharge pressure, 5 Nm3/hr flow rate, 4 kW/5 HP motor.
**PDC-4-800-3500** two-stage compressor, oxygen service, Industrial Gas Industry, 240 barg/3,500 psig discharge pressure, 123 Nm3/hr flow rate, 15 kW/20 HP motor.

**PDC-4-300-300** single-stage duplex compressor, natural gas, Research & Development, 18 barg/261 psig discharge pressure, 90 Nm3/hr flow rate, 15 kW/20 HP motor.

**Suction Pressure Range**
Sub atmosphere and above

**Discharge Pressure**
Psig/Barg

Representative
Transfill Applications:
6,000/413

Representative
Industrial Applications:
6,500/448

Representative Hydrogen
Energy Applications:
14,500/1,000

**Flow Rate**
Up to Scfm/ Nm3/hr:
150/241

**Horse Power**
Up to Hp/kW:
40/30
**PDC-4-600-600 (130)** duplex compressor, hydrogen, Petrochemical Industry, 40 barg/580 psig discharge pressure, 350 Nm3/hr flow rate, 22 kW/30 HP motor.

- **Transmitter panel**
- **Alarm annunciator**
- **Auxiliary oil pump and motor**
- **Tie in points**
- **Controls with 2oo3 (two out of three) voting**
- **Suction and discharge accumulators**
- **Pressure gauges equipped with integral valve manifolds**
**PDC-5-150-350** two-stage compressor, tetrafluoroethylene (TFE) gas, Chemical Industry, 21 barg/304 psig discharge pressure, 160 Nm3/hr flow rate, 37 kW/50 HP motor.

**PDC-5-1000-2500** two-stage compressor, carbon monoxide gas, Specialty Gas Industry, 165 barg/2,400 psig discharge pressure, 245 Nm3/hr flow rate, 55 kW/75 HP motor.
PDC-13-1000-3500 two-stage compressor, hydrogen gas, Oil & Gas Refining Industry, 200 barg/2,900 psig discharge pressure, 200 Nm3/hr flow rate, 90 kW/125 HP motor.

PDC-13-300-500 two-stage compressor, syngas, Bio-gas Industry, 30 barg/435 psig discharge pressure, 750 Nm3/hr flow rate, 90 kW/125 HP motor.
PDC-SP-900-5000-15000 three-stage compressor, hydrogen gas, Vehicle Filling, 950 barg/14,000 psig discharge pressure, 50 kg/hr flow rate, 180 kW/240 HP motor.

**Suction Pressure Range**
Sub atmosphere and above

**Discharge Pressure**
Psig/Barg
Representative Industrial Applications: 6,500/448
Representative Hydrogen Energy Applications: 14,500/1,000

**Flow Rate**
Up to Scfm/ Nm3/hr: 2,500/4,000

**Horse Power**
Up to Hp/kW: 300/224
A diaphragm compressor is a positive displacement machine which consists of a hydraulic system and a gas compression system. Diaphragm compressors are somewhat traditional in the sense that the hydraulic system uses a linear reciprocating piston attached to a crank shaft that is driven by an electric motor. The hydraulic piston travels through a cylinder which moves a column of oil. This oil is used to lubricate the lower end running gear and to energize the gas processing system.

The gas processing system consists of the gas head assembly, three metal diaphragm plates and the compressor check valves. When the hydraulic oil is pumped to the underside of the diaphragm set they flex through a contoured cavity in the gas head as the compressor check valves allow for the process gas to flow in & out of the compressor.

Triple metal diaphragm compressors are unique because they are leak free and non-contaminating since they do not utilize dynamic seals and the diaphragm set completely isolates the process gas from the hydraulic system. Each compressor also includes a leak detection system that monitors the integrity of the diaphragms and static o-rings. Breaches in these components can signal an alarm and or automatically shut down the compressor.
A Wide Range of

**P&ID SINGLE STAGE**
Typical P&ID for a standard bare unit, basic and turnkey system for a single and duplex compressor

**P&ID TWO STAGE**
Typical P&ID for a standard bare unit, basic and turnkey system for a two-stage compressor
Compressor Solutions

PDC Machines provides standard and custom-designed diaphragm compressors with a comprehensive assortment of options.

COMPLEX CUSTOMIZED PROCESS SOLUTIONS

A customized compressor consists of the standard system in addition to a wide variety of piping accessories, instrumentation and controls which are typically defined by the customer.
Dry-Running Piston Compressors

For absolutely oil free compression of a wide variety of gases, saturated gases and air.

Model Series
PDC-PRx 300

<table>
<thead>
<tr>
<th>Suction Pressure max</th>
<th>Psig/Barg</th>
<th>450/31</th>
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<td>13/10</td>
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<tr>
<td>Design</td>
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<td>Vertical Cooling: Air</td>
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Model Series
PDC-P2W

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<th>Psig/Barg</th>
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<td>Vertical</td>
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<tr>
<td>Cooling</td>
<td></td>
<td>Water</td>
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PDC-PLW-60-22 single-stage compressor, pumping hydrogen in a recycle process, Oil & Gas Refining Industries, 27 barg/391 psig discharge pressure, 180 Nm3/hr flow rate, 7.5kW/10 HP motor.

PDC-PR1-300 single-stage compressor, compression of helium after air separation, Universities & Research Industries, 14 barg/203 psig discharge pressure, 100 Nm3/hr flow rate, 22 kW/29 HP motor.
**PDC-P1A-80-15** single-stage compressor, synthesis gas, Petrochemical Industry, 17.9 barg/260 psig discharge pressure, 55 Nm3/hr flow rate, 15kW/20 HP motor.

**Model Series**
PDC-P1A/P2A

**Suction Pressure max**
Psig/Barg
377/26

**Outlet pressure max**
Psig/Barg
377/26

**Horsepower**
Hp/kW
29/22

**Design**
Vertical

**Cooling**
Water

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**PDC-PR2-1000-115** two-stage compressor, hydrogen compression for storage, Chemical, 20 barg/289 psig discharge pressure 533 Nm3/hr flow rate, 115 kW/154 HP motor.

**Model Series**
PDC-PRx 700/1000

**Suction Pressure max**
Psig/Barg
668/46

**Outlet pressure max**
Psig/Barg
668/46

**Horsepower**
Hp/kW
167/125

**Design**
Vertical

**Cooling**
Water
PDC dry running piston compressors are positive displacement machines, which mainly consist of an oil lubricated crank drive and an absolutely oil free gas compression system.

The force transmission from the crank drive to the gas compression part (piston) is achieved with a crosshead design. All PDC – piston compressors are driven by electrical motors via V – belt or direct coupled, depending on the compressor size and application.

Oil seal glands in cooperation with the free stroke (distance piece) ensure, that the process gas is compressed absolutely oil free. Depending on the type the piston compressors are available as single or double acting machines.

The gas gland boxes can be provided with all necessary ports for leak and / or seal gas, cooling etc. based on the process requirements and gas features.

Piston rings and gas glands are made of special PTFE material in order to achieve long life time and minimum leak rates.

Small compressors are air cooled, the larger compressors are water cooled.

Suction valve lifting enables for a simple and cost effective means of depressurizing before starting the compressors.
Customer Support Services

PDC Machines provides outstanding customer support for all our clients. Our compressors are backed by a team of factory service technicians, engineers and a global support network to ensure maximum uptime of our customer’s operations. As an added value to our customers, PDC provides parts for compressors of other diaphragm compressor manufacturers.

Ready-to-ship parts

PDC stocks a full selection of consumable parts including diaphragms, O-rings, process check valves, hydraulic check & oil regulating valves, tubing components and more.

Typical shipping is within 24 to 48 hours. This ensures our users are back up and running quickly even when they experience unexpected downtime.

We also have available complete crankcases and crankcase components as well as select process heads for immediate shipment.

PDC spare part orders are processed quickly, labeled clearly for ease of identification and are 100% inspected for quality and accuracy.