



## Reciprocating Sealless Diaphragm Compressors



The Sundyne Sealless Series 9X Diaphragm Compressor (for pressures up to 5,000 psig) is available in single and two stage configurations, to tackle your most rigorous application.





# Reliable, Sealless Diaphragm Compression

## Pressure Products Industries (PPI) Is Now Sundyne PPI.

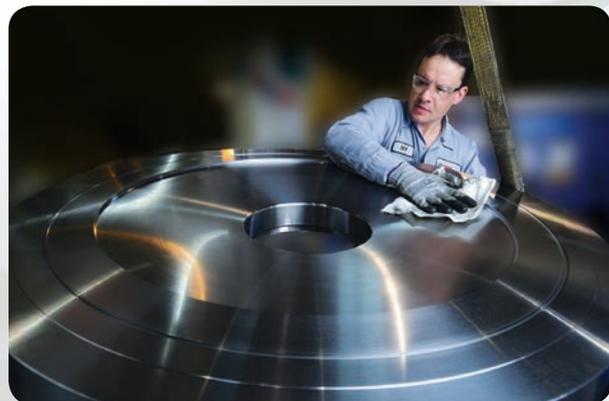
In following with our strategic goals and initiatives, Sundyne acquired Pressure Products Industries of Pennsylvania in 2014. The acquisition grows our current compressor portfolio to include a broad line of reliable sealless diaphragm compressors, unmatched in the process industries.

### A Legacy Of Quality

Our factory in the United States has been manufacturing leak-free compressors for over sixty years, engineering each shipped unit to meet the highest industry standards for sealless positive displacement machines. PPI is now positioned to be fully supported by Sundyne advanced technology, engineering, global sales channels and quality manufacturing systems.

## Sealless Diaphragm Compressors Series

Sundyne Sealless diaphragm compressors deliver total assurance of non-contaminating gas compression. Boasting a leak tight mechanism that features static seals which do not need to be purged or vented, these compressors present absolutely



▲ All process contacting parts are made from corrosion resistant alloys.

zero leakage threat to the atmosphere, providing an ideal solution for safely handling ultra-pure, corrosive and volatile gases. Additionally, our diaphragm compressors are designed to isolate the process media from the piston or piston rings with a set of metallic diaphragms, completely eliminating the risk of cross contamination. Most models are built to meet API 618 standards where applicable to diaphragm compressors. These machines are available in a variety of flexible configurations and sizes, making them easily customizable to provide the ideal compressor for your application. Backed by our global network of Authorized Service Centers and support staff, Sundyne Sealless diaphragm compressors are the reliability-focused solution for customers operating in the petrochemical, refining, electronic gas, specialty gas and polysilicon production industries.

### Durability

We have thousands of compressors installed in extreme operating environments, such as refineries, petrochemical facilities and immaculately clean research centers; but no matter where they are installed, diaphragm compressors deliver high performance, lubricant- and particulate-free compression of gases and mixtures. Plus, our proprietary Ultrafram diaphragm technology and proprietary cavity design provide unmatched diaphragm life.

### Reliability

Sundyne PPI diaphragm compressors feature heavy duty components custom engineered to ensure reliable operation. We performance test every compressor in the factory and document operating data to meet your specific service and operating parameters.

- Proprietary designs evolved from years of field experience assures reliability in the most demanding applications and environments
- Thorough factory testing prior to shipment verifies guaranteed test point
- Critical components, including the crankcase assembly and connecting rod(s), are designed for long life with minimal maintenance

### Application Experts

Sundyne PPI has decades of compressor engineering experience in the most demanding applications such as hydrogen, fluorine, oxidizing, and other hazardous and corrosive gases.

- Our engineers will assist you in the design of systems for the safe, reliable processing of critical gases

### Heavy Duty Rugged Design

We excel at engineering complete units – including crankcase, pulsation dampers, coolers, valves, instruments and an integrated control unit – to fit precisely into your operation’s workflow.

- Precision engineered diaphragm and cavity
- Proprietary Ultrafram technology ensures superior, reliable diaphragm life

### Longevity And Trouble-Free Operation

With regular maintenance, compressors will work for years to meet exacting API 618 standards.

### Cost Effective

Our pricing is extremely competitive with the industry, taking into account the total cost of ownership; including purchase price for high quality components, efficient lifetime operating needs and maintenance costs, including genuine OEM parts and fluids.

### Delivery Times

Because our diaphragm compressors are engineered, built and tested in the United States, we can meet or beat most delivery deadlines to keep your operation running smoothly.



▶ The heavy-duty crank case is designed for a long life with minimal maintenance.



- The Sundyne Project Management System ensures your equipment is delivered on site to your schedule
- One stop communication with your construction, engineering, and contract management teams

### Aftermarket Support

With the worldwide Sundyne Authorized Service Center network backing each unit shipped, you can rest easy knowing that your compressor will be properly maintained for continuous operation and any problems will see quick resolution using only Sundyne Genuine Parts.

- Sundyne global partners and factory compression experts worldwide
- Global manufacturing capabilities

### Designed To International Standards

API, ATEX, CE, CSA, KHK, SQL, KGS, TSSA, GOST, DOSH



# Reliable Contamination-free Compression

## The Diaphragm Sealless Compressor System

### Leak detection system:

Sundyne PPI originated the O-ring seal system for leak detection that has become an industry standard. Used in conjunction with triple diaphragm construction, it rapidly detects a potential diaphragm- or diaphragm-seal failure.

### Check valves:

Ball, poppet, or plate check valves are specified to match operating conditions and process gas. Valves are readily accessible for inspection, repair, or replacement, and can be removed without disassembly of the compressor head.

### Hydraulic inlet check valve:

Contains the injected hydraulic fluid within the head assembly. Valve body is stainless steel. Ball is 440 SS.

### Hydraulic pistons:

For design pressures to 3000 psi (200 bar), pistons are sealed with high-quality cast iron or filled-plastic piston rings in a hardened, honed sleeve. For higher pressures a packless, ringless piston is lap-fitted to a hardened, honed sleeve; the hydrodynamic film between the two provides the lubrication and the pressure seal.

### Hydraulic overpump valves:

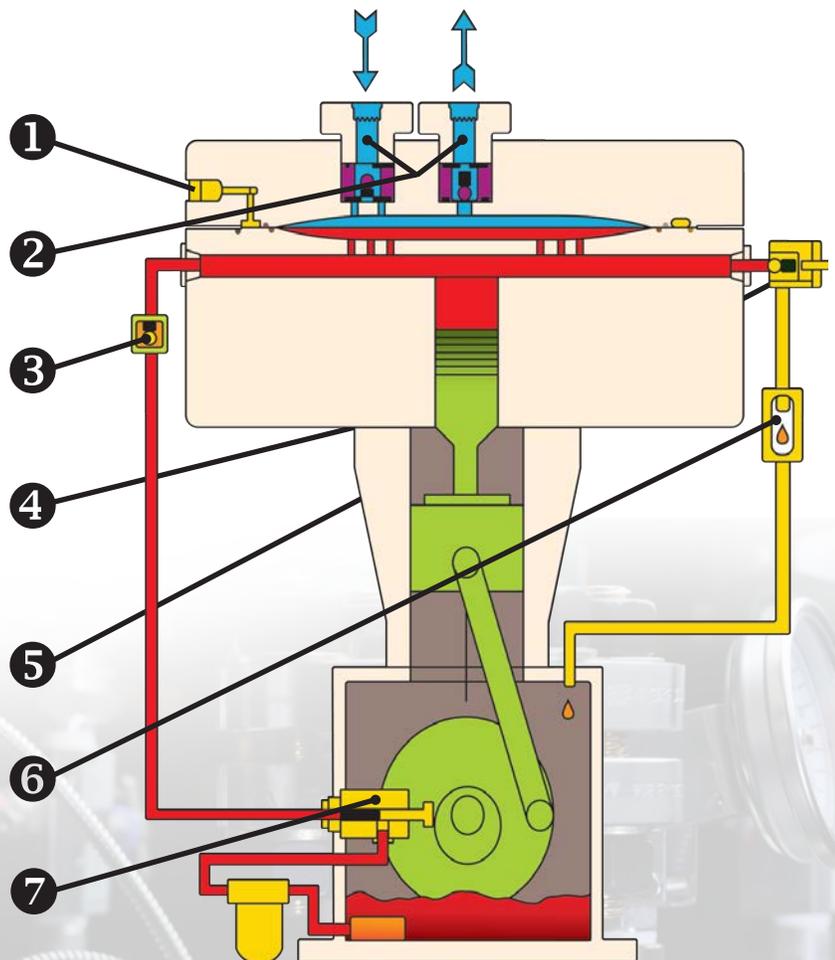
Controls the pressure of the hydraulic system. The loading of the die spring force determines the pressure range of the valve. Valve body is carbon steel. Poppet is hardened 17-4 tool steel.

### Overpump sight glass:

Provides visual indication that hydraulic fluid is being forced through the overpump valve and that the hydraulic system is functioning properly.

### Hydraulic injection pump:

Driven by the crankshaft, the pump injects fluid into the hydraulic system. Pump plunger is spring-loaded and is matched to the sleeve. Plungers are cast iron; sleeves are alloy steel. (see more at [www.sundyne.com](http://www.sundyne.com))



The Sundyne Sealless line of diaphragm compressors is designed to deliver higher purity gas compression than other compressor technologies, utilizing a set of metallic diaphragms to isolate the process media and totally eliminate the risk of cross contamination. Built to comply with API 618 standards, these machines are customized to meet the compression ratio and capacity for your unique application.

Benefits include: ▶



**RELIABILITY  
REALIZED.**



### State-Of-The-Art Manufacturing

All critical components are manufactured in our United States based factory, assuring the highest levels of quality control. We do accommodate tight delivery schedules to meet your needs.

### Enhanced Diaphragm Life

All aspects of our diaphragm compressor design are intended to enhance component life and improve operation, while simultaneously simplifying and reducing the need for maintenance. Sundyne PPI compressors can run for years with routine maintenance and oil changes.

### Hydraulic Oil System

The hydraulic system assures uniform diaphragm deflection, preventing knocks, vibration and cavitation, while yielding smooth, quiet compressor operation. Unique oil distribution techniques are employed to eliminate pressure differentials and gradients. The system utilizes an automatic priming pump, positive displacement high-pressure injection pump and an over pump valve with bypass feature for effortless start-up.

### High Product Purity

The triple diaphragm set ensures that the process gas is isolated from the hydraulic oil for absolute process purity.

### Environmentally Safe

Sundyne PPI diaphragm compressors use static seals, so there is zero leakage of process gas to the atmosphere.

### Corrosion Resistant Alloys

All process contacting parts are made from corrosion-resistant alloys, making these machines ideal for critical applications involving hazardous substances.

### Lower Energy Costs

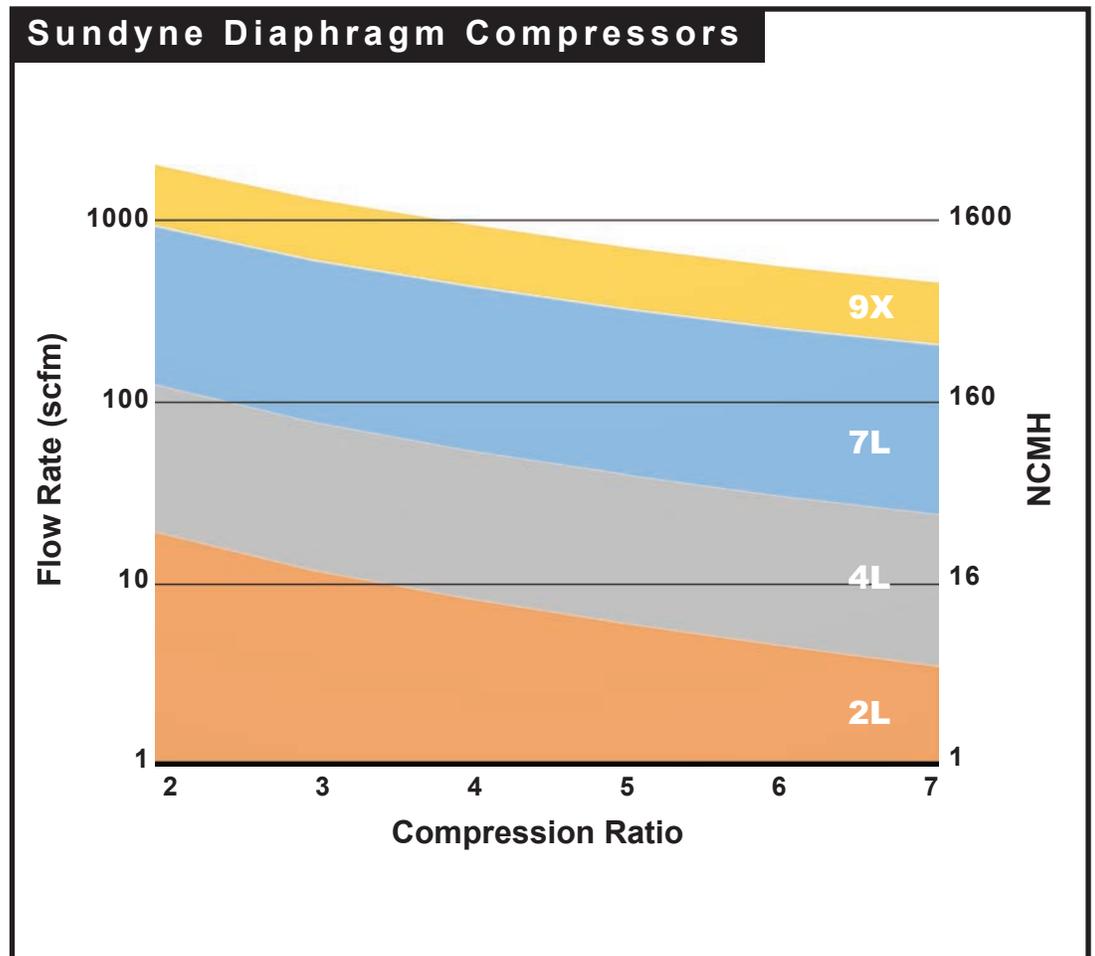
The crank cases are specially designed to provide the customer with the maximum possible compression at the lowest energy cost.

### Industry Standards

Sundyne PPI compressors meet API 618 standards for Reciprocating Compressors for petroleum, chemical and gas industry services.

### High Compression Ratio

Sundyne PPI diaphragm process gas compressors are used in applications ranging from vacuum to pressures up to 16,750 psig (1,150 bar). Our diversity of sizes ensures that you can find the right compressor for your application.





**Innovative Engineering – Reliability Realized**

During the initial definition of your compression needs, our engineers will provide you with guidance and recommendations to save you time and money. In fact, with your input, Sundyne has the experience and resources to design and manufacture a complete custom system to optimize your process. We utilize the latest technology in solids modeling and FEA analysis. All working components have been designed and tested for reliability and longevity.

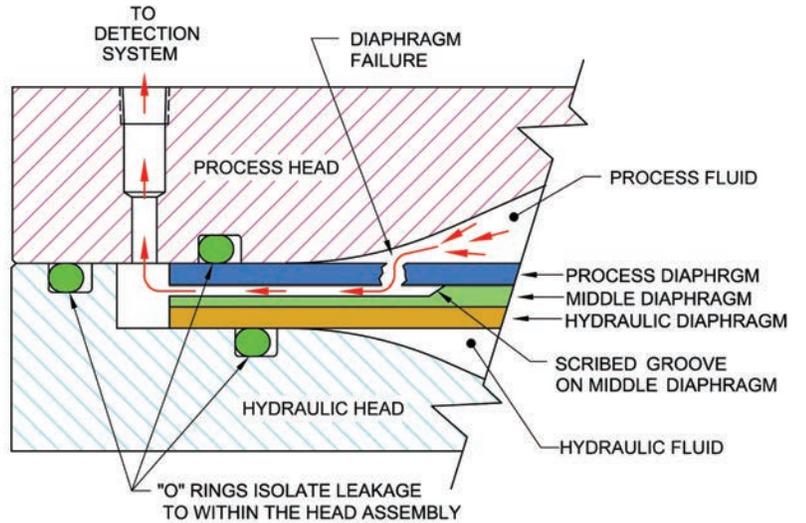
**Check Valves To Match Process Conditions**

Gas pressure, molecular weight, heat, corrosion, and velocity are crucial factors to consider when designing a check valve. Sundyne takes these design factors into account when specifying check valves for your compressor. Materials are selected to minimize wear, improve sealing, and reduce corrosive and erosive effects. Valve designs are selected based on process conditions. Elastomeric sealed poppet check valves are used for discharge pressures of around 5000 psi (345 bar) or less. Metal sealed ball check valves are used for higher pressures. Plate-type check valves are generally used on high capacity models.

**Leak Detection System**

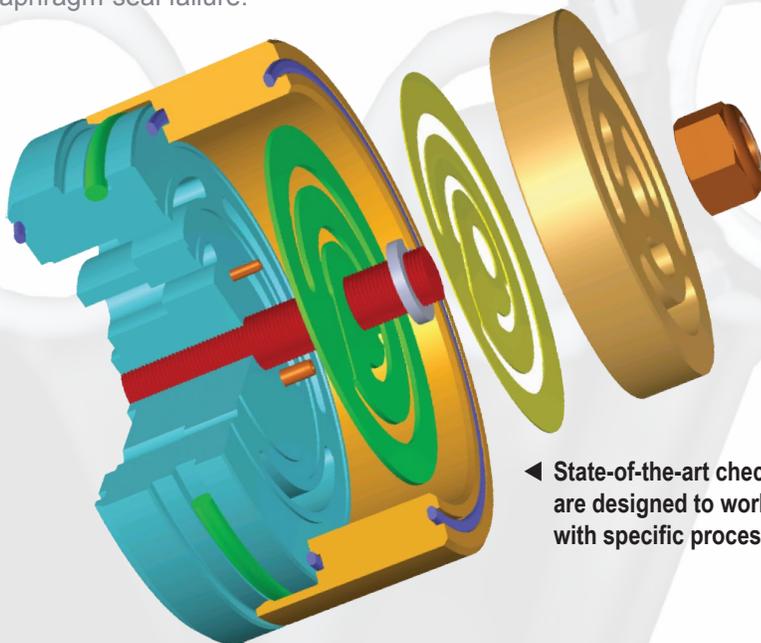
Sundyne PPI originated the O-ring seal system for leak detection that has become an industry standard. Used in conjunction with triple diaphragm construction, it rapidly detects a potential diaphragm or diaphragm-seal failure.

A matched set of three separate diaphragms, manufactured to precise requirements, guides any leakage to a containment system in the event of a failure. The outer two diaphragms are conventionally flat and smooth, while the specialty-coated middle diaphragm has scribed grooves, providing a path for gas or hydraulic fluid to flow to the detection system in the event of a failure.



**Options & Accessories For Custom Systems**

Systems can include a wide range of components, including suction and discharge pulsation dampeners, process after coolers, crankcase heaters, custom valves and fittings. Process piping can be customized; butt-weld and orbital-weld techniques can be used.



◀ State-of-the-art check valves are designed to work in concert with specific process conditions.





**Markets:**  
 Petrochemical  
 Specialty Gas  
 Energy  
 Silicon Manufacturing

# 9X

## 9X Series Diaphragm Compressors

The Sundyne Sealless Series 9X Diaphragm Compressor for pressures up to 5,000 psig is available in single and two stage configurations. Sub-series models are as follows:

- 9X Single Stage
- 9H Two Stage



<b>Maximum Working Pressure</b>	5,000 psi	345 bar
<b>Maximum Motor Size</b>	250 hp	185 kW
<b>Mounting</b>	H Configuration	
<b>Materials of Construction</b>	Process Side: SS Crankcase: Ductile Iron Connecting Rod: High Strength Ductile Crosshead: Ductile Iron Cylinder: Ductile Iron Wrist Pin: Tool Steel	
<b>Maximum Displacement</b>	146.6 ft <sup>3</sup> /min	
<b>Speed Range</b>	250 to 335 rpm	
<b>Maximum Discharge Temperature</b>	450°F	250°C
<b>Stroke Length</b>	8 in	203 mm
<b>Process Connection Flanges</b>	1 to 2.5 in	63 mm
<b>Piston Range</b>	3.3 to 11 in	279 mm
<b>Crankshaft Diameter</b>	5.5 in	139 mm
<b>Crankpin Diameter</b>	4.25 in	108 mm
<b>Main Bearing Type</b>	Tapered Roller	
<b>Crankpin Bearing Type</b>	Babbit Sleeve	
<b>Wrist Pin Bearing Type</b>	Roller	
<b>Lubricant-ISO</b>	150	
<b>Lubrication Type</b>	Pressurized	
<b>Sump Capacity</b>	34 Qts	32 Ltrs
<b>Oil Cooler</b>	Required	
<b>Cooling Type</b>	Water Cooled	



**Markets:**  
 Petrochemical  
 Specialty Gases  
 Energy  
 Silicon Manufacturing



# 7L

## 7L Series Diaphragm Compressors

The Sundyne Sealless Series 7L Diaphragm Compressor for pressures up to 6,250 psig is available in single and two stage configurations. Sub-series models are as follows:

- 5000, Single Stage
- 5L/H, Two Stage
- 7000, Single Stage
- 7L/H, Two Stage
- 9000, Single Stage
- 9L/H, Two Stage



Maximum Working Pressure	6,250 psi	431 bar
Maximum Motor Size	200 hp	50 kW
Mounting	L or H Configuration	
Materials of Construction	Process Side: SS Crankcase: Ductile Iron Connecting Rod: High Strength Ductile Crosshead: Ductile Iron Cylinder: Ductile Iron Wrist Pin: Tool Steel	
Maximum Displacement	110.9 ft <sup>3</sup> /min	
Speed Range	250 to 350 rpm	
Maximum Discharge Temperature	450°F	232°C
Stroke Length	7 in	178 mm
Process Connection Flanges	1 to 2 in	51 mm
Piston Range	0.9 to 10 in	254 mm
Crankshaft Diameter	5.5 in	139 mm
Crankpin Diameter	4 in	102 mm
Main Bearing Type	Tapered Roller	
Crank Bearing Type	Babbit Sleeve	
Wrist Pin Bearing Type	Roller	
Lubricant-ISO	150	
Lubrication Type	Pressurized	
Sump Capacity	34 Qts	32 Ltrs
Oil Cooler	Required	
Cooling Type	Water Cooled	



# 4L

**Markets:**  
 Petrochemical  
 Specialty Gases  
 Energy  
 R&D

## 4L Series Diaphragm Compressors

The Sundyne Sealless Series 4L Diaphragm compressor for pressures up to 16,750 psig is a highly reliable and robust design available in several sub series models.

- 4000 Single Stage      ■ 4L Two Stage
- 4X000 Single Stage    ■ 4LX Two Stage



<b>Maximum Working Pressure</b>	16,750 psi	1,155 bar
<b>Maximum Motor Size</b>	40 hp	30 kW
<b>Mounting</b>	L Configuration	
<b>Materials of Construction</b>	Process Side: SS Crankcase: Ductile Iron Connecting Rod: High Strength Ductile Crosshead: Steel Cylinder: Ductile Iron Wrist Pin: Tool Steel	
<b>Maximum Displacement</b>	45.9 ft <sup>3</sup> /min	
<b>Speed Range</b>	250 to 400 rpm	
<b>Maximum Discharge Temperature</b>	450°F	232°C
<b>Stroke Length</b>	4.5 in	114 mm
<b>Process Connection Flanges</b>	0.5 to 1.5 in	38 mm
<b>Piston Range</b>	0.6 to 7.5 in	191 mm
<b>Crankshaft Diameter</b>	2.5 in	64 mm
<b>Crankpin Diameter</b>	1.25 in	32 mm
<b>Main Bearing Type</b>	Tapered Roller	
<b>Crankpin Type</b>	Babbit Sleeve	
<b>Wrist Pin Bearing Type</b>	Needle	
<b>Lubricant-ISO</b>	68	
<b>Lubrication Type</b>	Pressurized	
<b>Sump Capacity</b>	10 Qts	9.5 Ltrs
<b>Oil Cooler</b>	Not Required	
<b>Cooling Type</b>	Water Cooled	

## Why A Sealless Diaphragm Compressor?



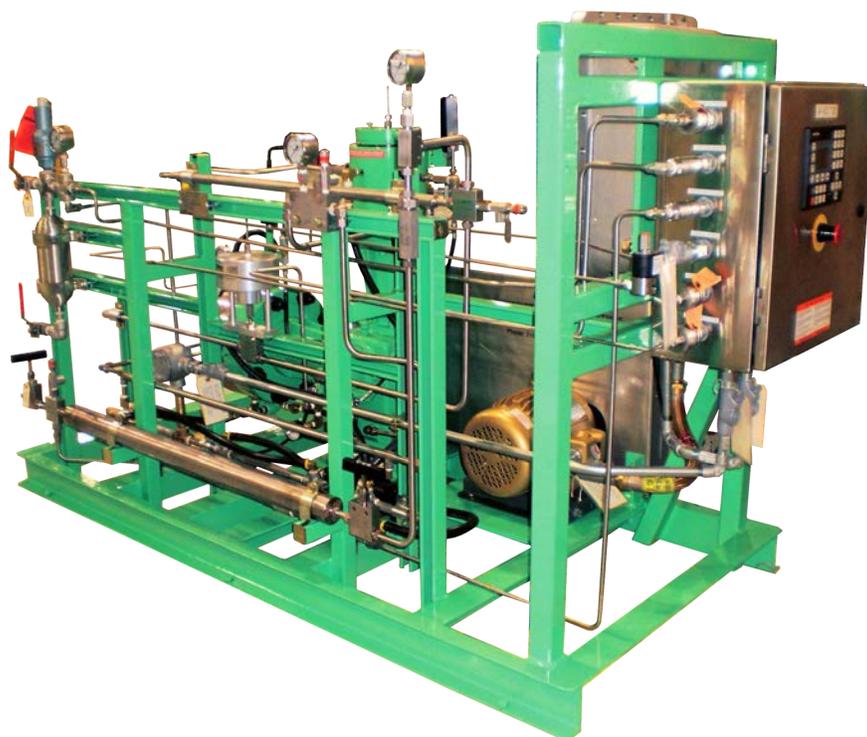
**Markets:**  
 Petrochemical  
 Specialty Gases  
 Energy  
 R&D

# 2L

### 2L Series Diaphragm Compressors

The Sundyne Sealless Series 2L Diaphragm Compressor is for pressures up to 15,000 psig and available in single and two stage configurations. Sub-series models include:

- 2000, Single Stage
- 2L, Two Stage



<b>Maximum Working Pressure</b>	15,000 psi	1,035 bar
<b>Maximum Motor Size</b>	15 hp	11 kW
<b>Mounting</b>	L Configuration	
<b>Flanges</b>	0.5 to 1.0 in process connection	
<b>Materials of Construction</b>	Process Side: SS Crankcase: Ductile Iron Connecting Rod: High Strength Ductile Crosshead: Aluminum Cylinder: Ductile Iron Wrist Pin: Tool Steel	
<b>Maximum Displacement</b>	7.1 ft <sup>3</sup> /min	
<b>Speed Range</b>	250 to 450 rpm	
<b>Maximum Discharge Temperature</b>	475°F	246°C
<b>Stroke Length</b>	2.5 in	64 mm
<b>Piston Range</b>	0.3 to 3.5 in	89 mm
<b>Crankshaft Diameter</b>	1.5 in	38 mm
<b>Crankpin Diameter</b>	1 in	25 mm
<b>Main Bearing Type</b>	Tapered Roller	
<b>Crankpin Bearing Type</b>	Babbit Sleeve	
<b>Wrist Pin Bearing Type</b>	Needle	
<b>Lubricant-ISO</b>	68	
<b>Lubrication Type</b>	Pressurized	
<b>Sump Capacity</b>	3 Qts	2.8 Ltrs
<b>Oil Cooler</b>	Not Required	
<b>Cooling Type</b>	Water Cooled	

Environmentally safe, leak free, non-contaminating processing of your critical gases.

# 1500



## Markets:

R&D  
Pilot Plant

### 1500 Series Diaphragm Compressors

The Sundyne Sealless Series 1500 Diaphragm Compressor is ideal for pilot plant and lesser quantity cylinder filling applications where high purity or hazardous gases are used in lower capacities. The 1500 Series compressor is supplied as standard with an integral electric drive motor and leak detection system.

- Displacements to 0.025 cfm (0.7 lpm)
- Inlet pressure: 0-2450 psi (0-170 bar)
- Discharge pressures to 6000 psi (414 bar)

Maximum Working Pressure	6,000 psi	414 bar
Maximum Motor Size	1.5 hp	1.1 kW
Mounting	In Line Vertical	
Materials of Construction	Process Side: SS Crankcase: Cast Iron Connecting Rod: Aluminum Wrist pin: Tool Steel	
Maximum Displacement	0.17 ft <sup>3</sup> /min	
Speed Range	155 to 185 rpm	
Maximum Discharge Temperature	450°F	232°C
Stroke Length	1.45 in	37 mm
Process Connection Flanges	0.25 to 0.25 in	
Piston Range	0.4 to 1.2 in	30 mm
Crankpin Diameter	0.5 in	13 mm
Main Bearing Type	Tapered Roller	
Crankpin Bearing Type	Aluminum	
Wrist Pin Bearing Type	Needle	
Lubrication Type	Splash	
Sump Capacity	1 Qt	0.95 Ltr
Oil Cooler	Not Required	
Cooling Type	Not Required	

## Backed By Global Support

Sundyne is more than just a manufacturer of high quality compressors and pumps... much more. Not only do we offer some of the fastest delivery times in the industry via our new FastLane program, we also back each and every product shipped with a full range of aftermarket support services, extending the value of our highly engineered machines well beyond the point of sale.

The Sundyne service team is here to help you protect your investment and provide a trouble-free customer experience.

## Our Aftermarket Programs Include:

- Expedite Programs
- Maintenance Kits
- Conversion Programs
- Gearbox Exchanges
- Service Schools
- On-Site Service
- Overhaul and Repair Services



Plus, our new *Reliability Assurance Kits* deliver trouble-free maintenance at regular intervals. To learn more about this convenient new service program, visit [www.sundyne.com](http://www.sundyne.com).

## Sundyne: An OSHA VPP Star Site

At Sundyne, Environmental Health and Safety (EH&S) is integral to our culture of excellence, and providing a 100% safe work environment through the manufacturing and installation phases of a project is a core priority.



**COMPRESSORS**

**PUMPS**

**GENUINE PARTS**

**SERVICE**

Sundyne Headquarters:  
**Sundyne, LLC**  
14845 West 64th Avenue  
Arvada, Colorado 80007  
USA  
1-866-Sundyne  
Phone: 1 303 425 0800  
Fax: 1 303 425 0896  
[www.sundyne.com](http://www.sundyne.com)

Sundyne Pennsylvania:  
**Sundyne PPI**  
201 Ivyland Rd.  
Ivyland, Pennsylvania 18974  
USA  
Phone: 1 215 675 1600

Sundyne China:  
**Sundyne PPI**  
Jianshe Hotel, Room 2012  
Guanglian Avenue  
Xicheng District  
Beijing, China 100055  
Phone: +86 10 63363218  
Fax: +86 10 63369862

Sundyne United Kingdom:  
**Sundyne HMD/Kontro Sealless Pumps, Ltd.**  
Marshall Road  
Hampden Park Industrial Estate  
Eastbourne East Sussex, BN22 9AN  
United Kingdom  
Phone: +44 1323 452000  
Fax: +44 1323 503369

Sundyne Spain:  
**Sundyne Marelli Bombas, S.R.L.**  
Ctra. Madrid-Toledo, Km.30.8  
45200 Illescas  
Toledo, Spain  
Phone: +34 925 53 45 00  
Fax: +34 925 51 16 00

Sundyne France:  
**Sundyne International S.A.**  
13-15, Bld. Eiffel - B.P. 30  
21604 Longvic Cedex  
France  
Phone: +33 (0)3 80 38 33 00  
Fax: +33 (0)3 80 38 33 66

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