



High Pressure Equipment
Sprague® Products



**Sprague Air Driven
Pumps, Gas Boosters
& Power Units**

Sprague® Products



About Sprague

Sprague air driven liquid pumps, gas boosters and power units have been providing high pressure solutions to the oil and gas, process chemical, utility, aviation and industrial markets for more than 60 years. Sprague Products was founded in 1946 by Bob Sprague to serve the aerospace industry with ground support equipment used for hydrostatic testing. The first air-operated pump was developed in 1947 and, other than minor modifications, is the same classic design today.

Sprague Products are used in a broad array of industrial markets. We provide design expertise, specialized manufacturing and quality standards to meet and

exceed the expectations of our diverse original equipment manufacturer (OEM) customer base for a variety of applications.

High Pressure Equipment Company has been singularly focused on providing quality components and systems for elevated pressure applications. Since its founding in 1954, HiP has shipped over four million high pressure valves and fittings to its loyal customers. Today, we manufacture a complete line of valves, fittings and accessories designed to provide leak-free operation at pressures ranging from 10,000 psi to 150,000 psi. In addition, we offer a family of reactors and pressure vessels, as well as pumping systems and pressure boosters.

Sprague Products

Air-Driven Hydraulic Pumps

The Sprague positive-displacement pump converts air-drive pressure into hydraulic discharge pressure. The pump uses low pressure air or gas to drive a large area piston which then drives a small area liquid piston that produces high hydraulic pressure. As the ratio between the air drive piston and the liquid piston increases, higher pressures can be achieved.

In operation, the Sprague pump reciprocates rapidly until the system's liquid pressure nears the desired level, as determined by the air regulator setting, and then slows to a stop when the liquid discharge and air-drive forces reach equilibrium. This liquid-air balance is maintained indefinitely in a holding condition with minimal energy consumption and with no increase in fluid temperature or parts movement. The pump will automatically restart if the liquid discharge pressure degrades or the inlet air-drive pressure is increased.

The Sprague pump is an efficient, time tested design that provides users with cost-effective and energy-saving benefits.

Applications for Air Driven Pumps:

- Hydrostatic testing of hose, pipe, tubing, pressure gauges, cylinders, transducers, valves, tools, tanks, pressure vessels and leak testing
- Hydraulic operations such as punch and pin presses, clamping devices, chucks and valve actuation
- Tooling and tightening functions such as bolt tensioning and torque wrenches
- Lifting tables, beam jacking and aircraft jacking





Air-Driven Gas Boosters

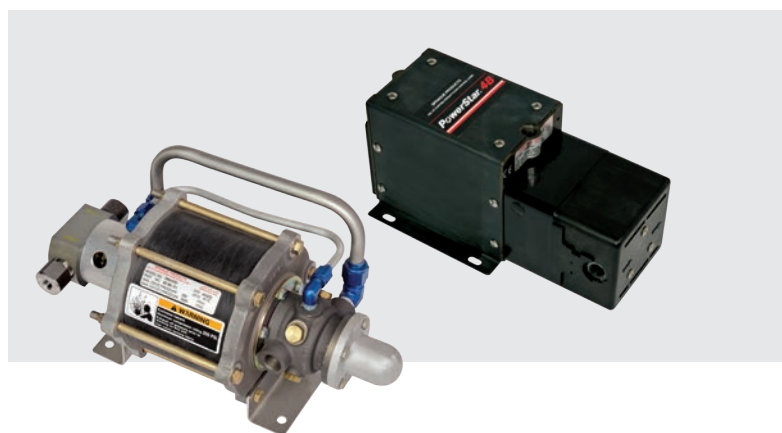
Sprague's air-driven gas boosters use the same principles of operation as our hydraulic pumps. The boosters employ a large area air piston, driven with low pressure compressed air or gas, that is mechanically coupled to a small area compression piston. The compression piston converts precharge gas to higher pressure, lower volume discharge gas. The discharge gas pressure developed by the compression piston is determined by the piston ratios, the regulated air-drive pressure and the available pre-charge pressure.

The function of the pre-charge pressure is to charge the high pressure cylinder inside the booster with gas, which reduces the time required to increase (boost) the discharge pressure. The discharge gas pressure can be accurately adjusted to any pressure level between the pre-charge pressure and the maximum discharge pressure by adjusting the air-drive regulator.

The Sprague boosters reach the desired pressure quickly, without heat build-up and will hold the pressure indefinitely with minimal energy consumption. When a pressure imbalance occurs, the booster will automatically restart to restore the discharge pressure to the regulated setting.

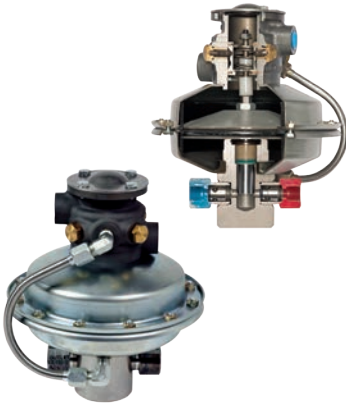
Applications for Air Driven Boosters and Air Amplifiers:

- Boosting gas pressures from nitrogen generators
- Nitrogen injection for molding machines
- Low pressure gas reclaim from storage bottles
- Inflating high pressure aircraft tires; shock and strut charging
- Gas spring charging systems for die and mold manufacturers
- Accumulator charging
- Filling air tanks from larger cylinders
- Testing of pneumatic components, air bags & pipe assemblies



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Air-Driven Hydraulic Pumps



J and JB Series Pumps

- Suitable for water, oil and a wide range of liquids
- Easily maintained, non-electric control
- 6" air drive motor with snap action pilot valve
- All stainless wetted section, nitrile standard
- Liquid seal options: Viton®, Neoprene, EPR or polyurethane
- Air seal options: JN, JBN - lubrication not required
 - Laboratories, food service, clean rooms
- Separation options JS, JNS, JBS, JBNS
 - Protects drive air
- J-Series, 6 ratios 10:1 to 100:1 nominal, pressures to 9,100 psig (627 bar)
 - Classic style – proven reliability
 - ½" NPT, 100 psi (7 bar) max drive air
 - ¾" NPT inlet, ¾" NPT outlet liquid connections
- JB-Series, 8 ratios, 35:1 to 300:1 nominal, pressures to 36,500 psi (2517 bar)
 - Severe service, polyurethane seal standard
 - ½" NPT, 100 psi (7 bar) max drive air
 - ¾" NPT inlet, ¾" NPT outlet liquid connections – 10,000 psi (690 bar) and below
 - ¼" NPT inlet, ¼" HPCT outlet liquid connections – above 10,000 psi (690 bar)



Modular PowerStar™ 4 Pumps

- Suitable for water, oil and a wide range of liquids
- Modular design, ratio change possible
- 4" air-drive motor, spool pilot
- Stainless wetted section, nitrile standard
- Liquid seal options: Viton, Neoprene, EPR or polyurethane
- Non-lubricated air seals standard
- Separation option: P4S*, S*P4S*
 - Protects air drive
- Baffle style muffler minimizes "icing"
- P4 Series, 8 ratios 5:1 to 333:1 actual, pressures to 33,300 psig (2296 bar)
 - ¾" NPT 100 psi (7 bar) max drive air
 - ¾" NPT inlet, ½" NPT outlet liquid connection – P45, P410
 - ½" NPT inlet, ¾" NPT outlet liquid connection – P421, P434, P464
 - ¾" NPT inlet, ¼" HPCT outlet liquid connection – P4114, P4203, P4333



SM-3 Mini Pump

- Suitable for water, oil and a wide range of liquids
- Easily maintained, cable assembly design, air-drive rotates 360°
- 3" air drive motor, glass filled Acetyl
- Stainless or aluminum liquid end
- Porting option: inline or right angle
- Seal options: Viton, Neoprene, EPR or polyurethane
- Separation standard
- SM-3 Mini Pump, 8 ratios 5:1 to 225:1 nominal, pressures to 25,900 psig (1786 bar)
 - ¼" NPT 100 psi (7 bar) max drive air
 - ¾" NPT inlet, ¾" NPT outlet liquid connection – 10,000 psi (690 bar) and below
 - ¼" NPT inlet, ¼" HPCT outlet liquid connections – above 10,000 psi (690 bar)

Air-Driven - High Output Pumps

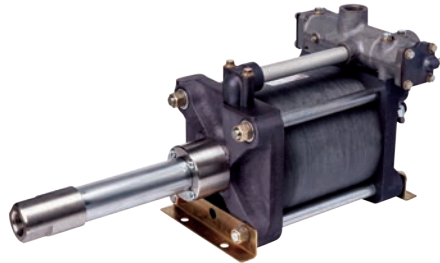


S-216-JD- Pump – Double Acting

- Suitable for oil, refrigerants, and low lubricity liquids
- Ratios: 6.8:1, 34:1, 36:1, 60:1, pressures to 6,000 psig (414 bar)
- 12 GPM (45 LPM) max - 6" air-drive motor
- Available as JDN non-lubricated
- 3/8" NPT air-drive connection – 100 psi (7 bar) max air drive
- 3/8" NPT inlet, 1/4" NPT outlet liquid connections
- 6.8:1 ratio – 1/2" NPT air-drive; 1" NPT inlet, 1/2" NPT outlet, 1/4" NPT bypass

S-218-200D Pump – Double Ended

- Suitable for water, oil and a wide range of liquids
- 2.25 gpm (8.7 lpm) - pressures to 20,000 psig (1379 bar)
- 8" air drive, 200:1 nominal ratio
- 1" NPT drive air connection – 100 psi (7 bar) max drive air
- 1/2" NPT inlet, 1/4" HPCT outlet liquid connections



S-218-GJC Pump – Double Acting

- Suitable for water, oil and a wide range of liquids
- 10.5 HP high output
- Ratios, 45:1, 65:1 - pressures to 6500 psig (448 bar)
- Stainless and chrome plated steel wetted section
- Nitrile seals standard
- Liquid seal options; Viton, Neoprene, EPR or polyurethane
- 8" air-drive motor with anti-icing water emitters
- 1" NPT air-drive connection – 100 psi (7 bar) max air drive
- 1" NPT inlet, 1/2" NPT outlet liquid connections

Manually Operated Pumps



S-525 Hand Pump

- Suitable for water, oil and a range of liquids
- Stainless wetted section, nitrile standard
- Liquid seal options: Viton, Neoprene, EPR or polyurethane
- S-525-J Series - manually operated
 - Ratios 35:1, 60:1, 100:1, pressures to 4350 psig (300 bar)
 - 3/8" NPT inlet, 3/8" NPT outlet liquid connections
- S-525-JB Series – manually operated
 - Ratios 150:1, 200:1, 300:1 pressures to 17,400 psi (1200 bar)
 - 3/8" NPT inlet, 1/4" HPCT outlet liquid connection

SM-3 Mini Hand Pump

- Water, oil, a range of liquids
- Easily maintained, cable assembly design
- Stainless or aluminum liquid end
- Porting option: inline, or right angle
- Seal option: Viton, Neoprene, EPR or polyurethane
- Separation standard
- SM-3 Mini Pump, 8 ratios 5:1 to 225:1 nominal, pressures to 25,900 psig (1786 bar)
 - 3/8" NPT inlet, 3/8" NPT outlet connection – 10,000 psi (690 bar) and below
 - 1/4" NPT inlet, 1/4" HPCT outlet liquid connections – above 10,000 psi (690 bar)

Air-Driven Gas Boosters



S-86-JN Gas Booster

- Compatible with a wide range of common gases
- Available in 7 ratios, pressures to 13,500 psig (931 bar)
- Single or double-ended designs
- Drive air lubrication not required
- S486JN power unit available with air drive controls, outlet controls, gages, muffler
- ½" NPT air-drive connection - 200 psi (14 bar) air drive max
 - 60:1 and 100:1 – 100 psi (7 bar) drive air max
- ¾" NPT inlet, ¾" NPT outlet gas connections, 2:1, 5:1
- ¼" NPT inlet, ¼" NPT outlet gas connections, 15:1, 30:1, 60:1, 100:1



PowerStar 4 Gas Booster

- Compatible with a wide range of common gases
- Pressures to 8,900 psig (614 bar)
- Single ended available in 4 ratios
- Double ended available in 4 ratios
- Dual ratio available in 3 ratios
- Available with separation, protects the drive air
- Self lubricating seals
- 4" Air-drive motor with spool style pilot valve
- Exhaust air cools high pressure cylinder
- ¾" NPT air-drive connection – 100 psi (7 bar) drive air max
- ¾" NPT inlet, ¼" NPT outlet gas connections



Air Amplifier and Gas Booster Power Units

- Single or double ended designs
- Self lubricating seals
- ¾" NPT air-drive connection – 100 psi (7 bar) drive air max
- ½" NPT inlet, ¾" NPT outlet gas connections
- Amplifiers
 - Available mounted on a 5 gallon, 500 psi ASME tank – controls included
 - AA4PAA4, 37 degree male flare SAE -8 inlet and outlet gas connections
 - PowerStar amplifier in 4:1 ratio only, pressures to 450 psi (31 bar)
 - 50 psi precharge provides 300 psi outlet
- S486-JN Gas Booster Power Units available with air drive controls, outlet controls, gages and muffler
 - S-86-JN booster available in 6 ratios
 - Pressures to 10,300 psig (614 bar)
 - ¼" HPCT outlet 60:1 and 100:1 ratios

Air-Driven Power Units



Bench Type Power Units

- Water, oil, wide range of liquids
- Available with J or JB series pump
- Pressures to 36,500 psi
- Air controls, liquid controls, gauges, muffler
- S-440-J or JB – 23" x 11" x 11"
 - Powder coated baseplate
- S-441-J or JB – 12" x 12" x 14"
 - Stainless steel baseplate
- S-442-J or JB – 23" x 11" x 11"
 - Powder coated baseplate
 - Bypass prefill

Reservoir Power Units

- Water, oil, wide range of liquids
- Air controls, liquid controls, gauges, muffler
- P-1704 – 14.5" x 16.75" x 18"
 - Stainless tubular frame
 - 3 gallon stainless reservoir
 - PowerStar 4 double ended
- S-440-JR – 11.1" x 16" x 8.1"
 - 1 gallon zinc plated reservoir
 - Available with J or JB series pumps



Portable Power Units

- Water, oil, wide range of liquids
- Available with J/JB series or PowerStar 4 pump
- Enclosed option
- Air controls, liquid controls, gauges, muffler
- S-1500-J or JB – 36.2" x 15.3" x 15.3"
 - Pressures to 36,500 psi (2517 bar)
 - Wheeled, tubular frame,
 - Panel style operator interface
- P-1500 – 36.2" x 15.3" x 15.3"
 - Pressures to 33,300 psi (2296 bar)
 - Wheeled, tubular frame
 - Panel style operator interface



Contractor Power Units

- Water, oil, wide range of liquids
- Available with J or JB Series Pump
- Pressures to 36,500 psi
- Air controls, liquid controls, gauges, muffler
- S-1600-JB – 28.5" x 12.1" x 18.2"
 - Powder coated tubular frame
 - Inlet filter
- S-1400-J – 15.1" x 15.1" x 15.1"
 - Powder coated tubular frame
- S-1401-J – 15.1" x 15.1" x 15.1"
 - Stainless tubular frame

Accessories



- Gauge Savers 5 ratios-pressures to 5,000 psi (345 bar)
- Safety relief valves pressures to 20,000 psi (1379 bar)
- Restrictor valve pressures to 30,000 psi (2069 bar)
- Check valves pressures to 30,000 psi (2069 bar)
- High pressure hydraulic gauges pressures to 60,000 psi (4138 bar)
- Mufflers
- Air control unit - FRL

HiP...Our Name is High Pressure

High pressure valves, fittings and tubing manufactured to the highest quality standards, delivered with the shortest lead times, and priced to make you money... it's been the focus at HiP throughout our 65 year history. Today, we feature a broad product portfolio capable of handling pressures up to 150,000 psi and carry an extensive inventory allowing us to offer same day shipping of many items. In addition to our high pressure valves, we offer a complete line of reactors and pressure vessels and a recently expanded family of pumping systems and generators. For special requirements, such as exotic alloys and custom manifolds, our technical/engineering team will help you find the ideal solution.

HiP is an ISO 9001 certified company and a preferred supplier within diverse markets such as waterjet cutting and cleaning, oil and gas, chemical and petrochemical, research and development, university, government, and general industry.



ISO 9001
CERTIFIED



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