



WHITE KNIGHT®
.....engineer approved™

PSR SERIES PUMPS

Ultrapure Pumps for Advanced Chemical Processes

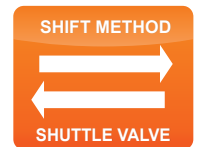
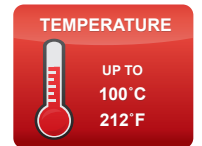
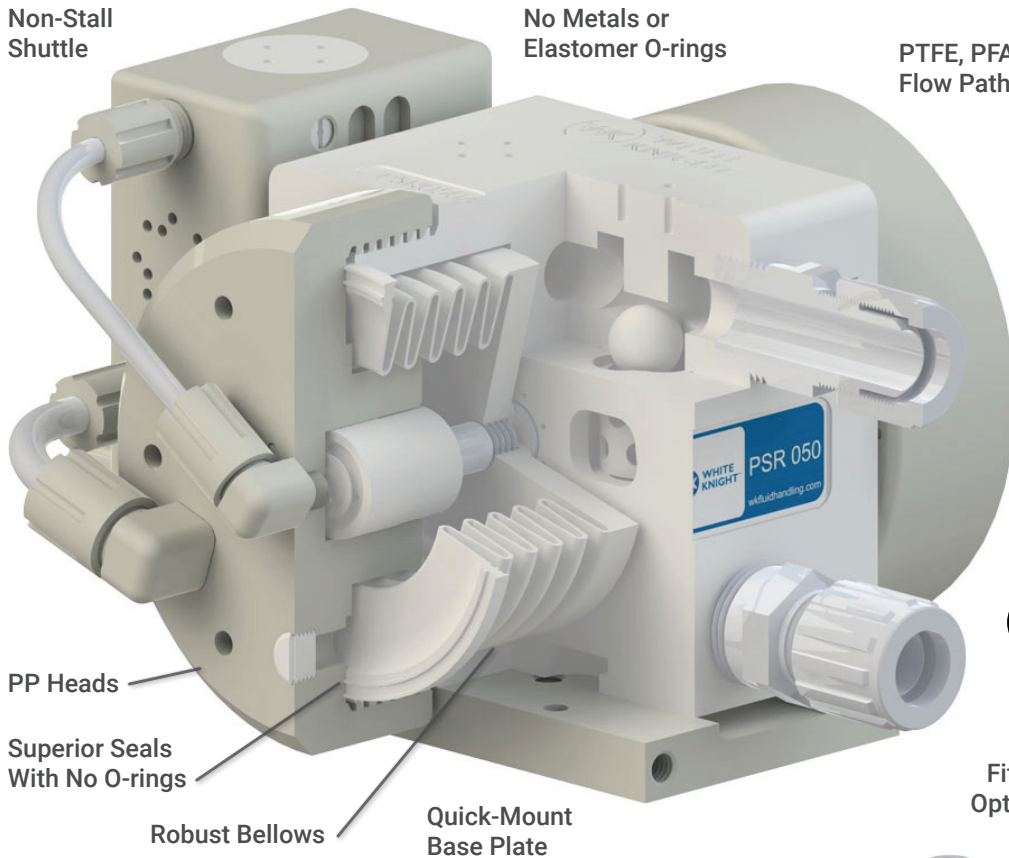
Affordable metal-free pumps with PTFE, PFA flow paths for ultrapure chemical recirculation. PSR Series pumps are capable of 100°C (212°F) fluid temperatures and 4 Bar (60 psi) air pressures. They are safe, leak-free and proven reliable to more than 200 million cycles.

Advanced Pump Technologies

Non-Stall Shuttle

No Metals or Elastomer O-rings

PTFE, PFA Flow Path



Features & Benefits

- Proven reliable to 200+ million cycles
- Process-safe PTFE, PFA flow paths
- Contains no metals or elastomers
- Durable machined design with minimal parts
- Reliable, safe operation with leak-free seals and no O-rings
- On-board, non-stall shuttle saves space and eliminates resets
- Pneumatic Logic™ minimizes liquid pulsation and pump vibration
- Lubricant-free shifting eliminates potential contamination
- No electric motors, which generate heat
- Class 100 cleanroom assembly, testing, and packaging
- No preventative maintenance during one-year warranty



Industries

Semiconductor
LEDs & Electronics
Flat-Panel Displays
Photovoltaic / Solar
Aerospace

Applications

Chemical Delivery
Chemical Circulation
Chemical Processing
Chemical Reclaim
Bulk Transport
CMP Slurry

<https://wkfluidhandling.com/psr-series/>

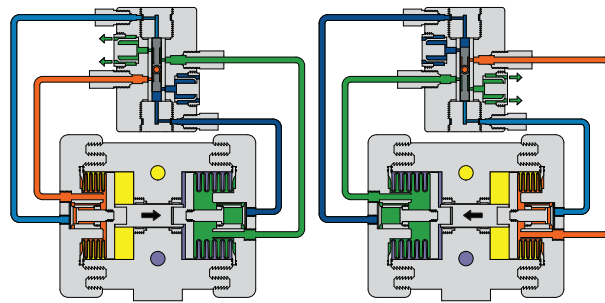




Operation

Pneumatic Logic™ minimizes pulsation, vibration, and wear. It ensures correct spool placement at the end of each stroke and resets shuttle valves after shutdowns. It has no detents to fail or seals to fatigue.

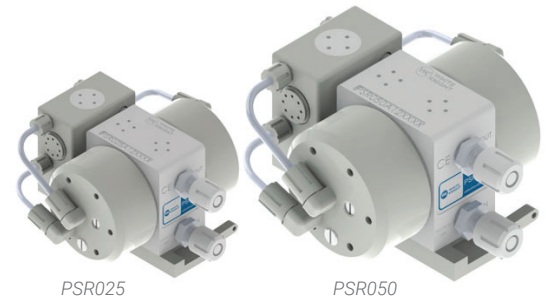
See online animation.



Supply air to left side

Supply air to right side

- Supply Air
- Shift Air
- Liquid Out
- Exhaust Air
- Ambient Air
- Liquid In



PSR025

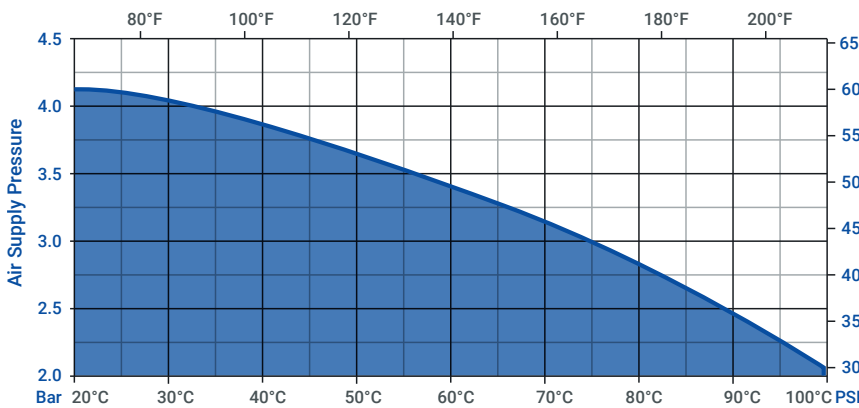
PSR050

Configuration

PSR 050 - F 12 - LF0 - SF0 - T P 08 -
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
 (optional)

- ① **Pump Model**
PSR = Standard Recirculation
- ① **Pump Size (max discharge)**
025 = 25 lpm (6.5 gpm)
050 = 60 lpm (13 gpm)
- ② **Check ball material**
blank (default) = PTFE
F = PFA check balls
- ③ **Fitting Style**
F = Flaretek® compatible
T = Tube Out
W = Weldable
P = Pillar S-300®
N = Female NPT (FNPT)
- ④ **Fitting Size**
04 = 1/4 in
06 = 3/8 in
08 = 1/2 in
12 = 3/4 in
16 = 1 in
20 = 1-1/4 in
- ⑤ **Leak Detection** (optional)
LF0 = 15 ft fiber optic cable, no amplifier
LF1 = 15 ft fiber optic cable, D10 amplifier
LF2 = 25 ft fiber optic cable, no amplifier
LF3 = 25 ft fiber optic cable, D10 amplifier
LC0 = 15 ft conductivity cable
- ⑥ **Stroke Detection**
SF0 = Single probe, 15 ft fiber optic cable, no amplifier
SF1 = Single probe, 15 ft fiber optic cable, D10 amplifier
SF2 = Single probe, 25 ft fiber optic cable, no amplifier
SF3 = Single probe, 25 ft fiber optic cable, D10 amplifier
SP1 = Single Pressure Switch (NPN)
SP2 = Dual NPN Pressure Switch (each with two DP2)*
SP4 = Single PNP Pressure Switch
SP5 = Dual PNP Pressure Switch (each with two DP2)
- ⑦ **Liquid Outlet Position**
F = Front straight liquid outlet
T = Top straight liquid outlet
- ⑧ ⑨ **Liquid Outlet Style and Size**
Choices are same as ③ and ④ above
- ⑩ **Shuttle**
blank (default) = PTFE
VX0 = No shuttle, standard ports*
VG1 = Gravity reset with remote exhaust
VM0 = Mag detent with standard exhaust**
VM1 = Mag detent with remote exhaust**

Temperature Limitations



Specifications

Model		PSR025	PSR050		
Max Flow Rate*		21.9 lpm (5.79 gpm)	57.5 lpm (15.19 gpm)	Max Fluid Temperature	100°C (212°F)
Displacement Per Cycle*		0.074 liters (0.019 gal)	0.178 liters (0.047 gal)	Max Supply Air Pressure	4 Bar (60 psi)
Cycles per min		≤ 300	≤ 258	Min Startup Air Pressure	1.4 Bar (20 psi)
Air Connection		1/4 in FNPT	1/4 in FNPT	Fluid Path Materials	PTFE, PFA
Weight		2.5 kg (5.5 lb)	5.0 kg (11.0 lb)	Non-Fluid Path Materials	PTFE, PFA, PP, Ceramic
Suction Lift*		≤ 1 m (3 ft)	≤ 1 m (3 ft)	Stroke Detection	Fiber optic with or without D10 sensor, or solid state pressure switch (NPN or PNP)
Sound	Pressure**	69.38 dB(a) 76.55 dB(a)	72.38 dB(a) 79.12 dB(a)	Leak Detection	Fiber optic with or without sensor, or conductivity
	Power**	58.52 dB(a) 65.75 dB(a)	64.31 dB(a) 71.98 dB(a)	Electronic Control	CPC, CPT, or custom. Call for details.

* May vary by configuration and system. Suction lift diminishes over time. Recommended installation level less than 3 ft above source. To calculate displacement, divide flow rate by CPM.
 ** dB level at 60 psi 50 CPM (top); 60 psi max CPM (bottom). Sound levels measured in accordance with ISO9614-2:1997.

Define optional items only if desired. Define outlet fitting options (6-8) if they differ from inlet fitting options (2)(3).

All fittings are not available in all sizes, and all fittings are not compatible with all pump sizes. Call for details. Operating pumps in timer mode requires end-of-stroke detection to prevent over stroking. Operating a pump in timer mode without stroke detection voids the warranty.

*Comes without White Knight shuttle valve.

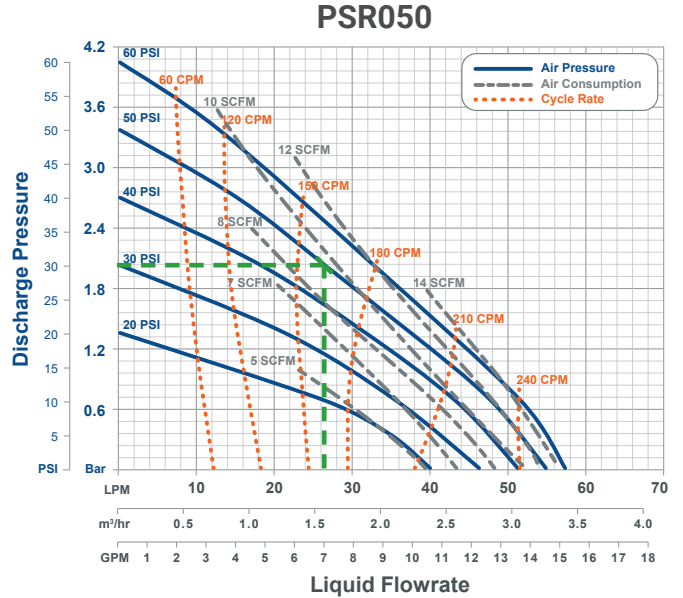
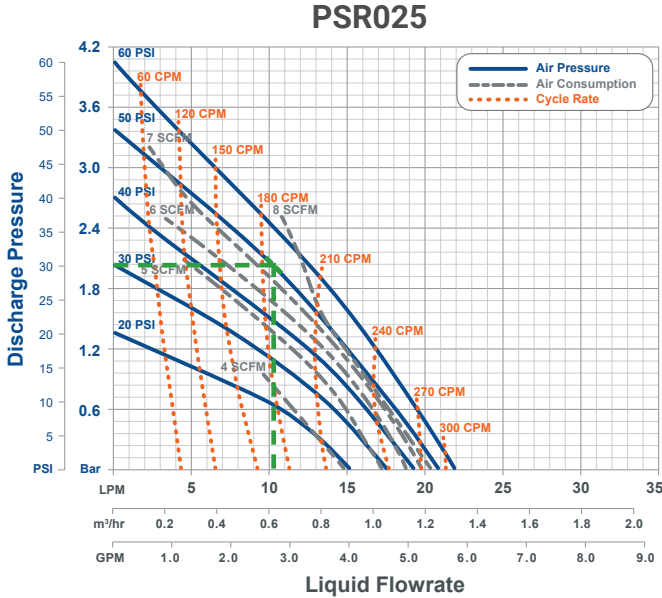
**Not available with PSR025

Contact White Knight for copy exact information.



Performance

Draw a horizontal line from desired discharge pressure and a vertical line through desired flow rate. At their intersection, estimate required air supply pressure, cycle rate and air consumption. See green lines for examples in the charts below.



Example 1

At 2 Bar (30 psi) discharge pressure and 50 psi air supply pressure, PSR025 pumps provide 10.5 lpm (2.6 gpm) flow rate. They would cycle at 185 CPM, and exhaust 7.25 SCFM of air.

Example 2

At 2 Bar (30 psi) liquid discharge pressure and 50 psi supply pressure, PSR050 pumps provide 26 lpm (7 gpm) flow rate. They would cycle at 165 CPM and exhaust 9.5 SCFM of air.

**Graph is for reference only. Performance was measured utilizing 1/2 in (3/8 in ID) air line and 1-1/4 in (1-1/8 in ID) liquid lines with 1 ft flooded suction. Performance may vary in your system.*

Dimensions

[mm] inches

