

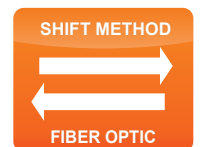
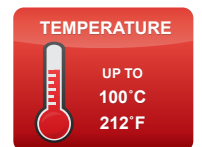
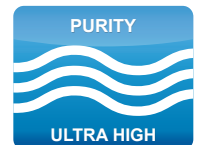
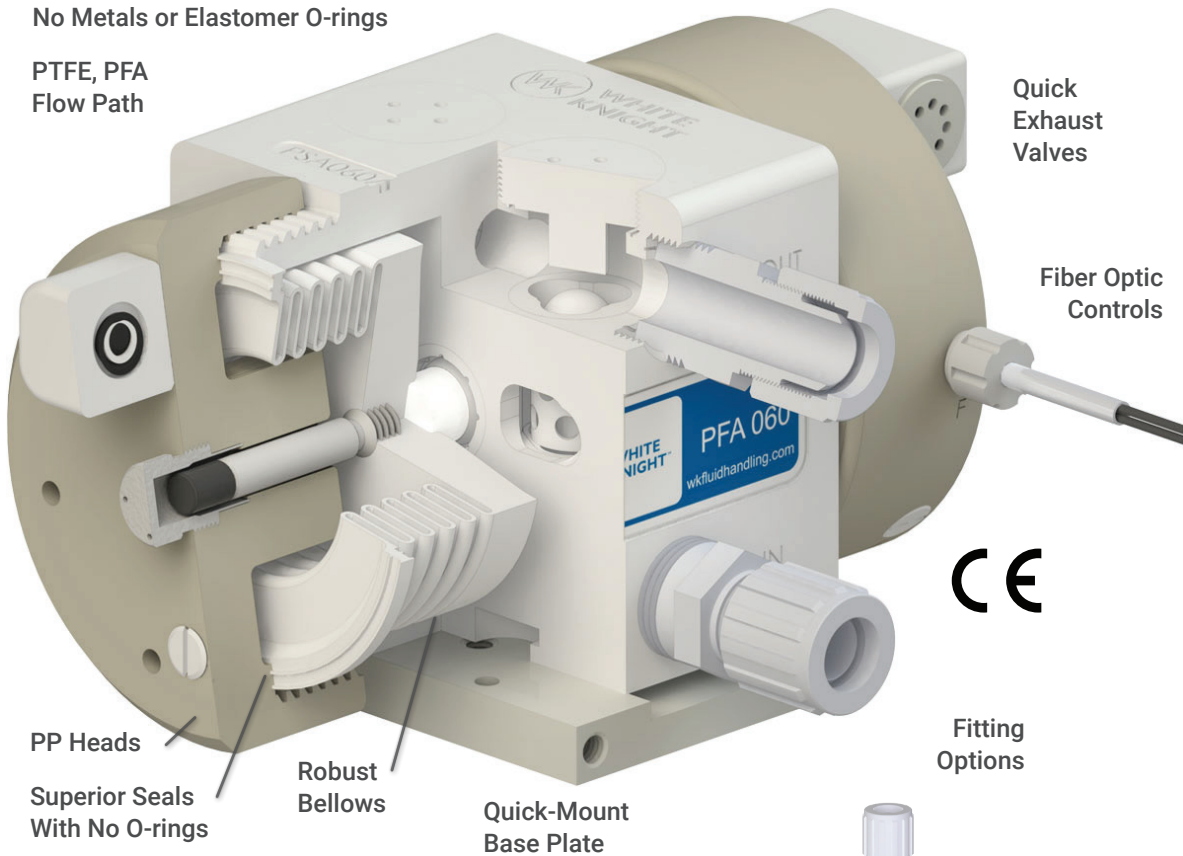
## Ultrapure Chemical Pumps with Fiber-Optic Sensors

Metal-free pumps with PTFE, PFA flow paths for ultrapure chemical process applications. PFA Series pumps are capable of up to 100°C (212°F) fluid temperatures and 7 Bar (100 psi) air pressures. PFASD models can run dry for more than one hour without pump damage.

### Advanced Pump Technologies

No Metals or Elastomer O-rings

PTFE, PFA  
Flow Path



### Features & Benefits

- Process-safe PTFE, PFA flow paths
- Contains no metals or elastomers
- Durable machined design with minimal parts
- Fiber-optic sensors provide optimal control
- Reliable, safe operation with leak-free seals and no O-rings
- Robust bellows allow for 7 Bar (100 psi) supply pressure
- Lubricant-free shifting eliminates potential contamination
- No electric motors, which generate heat
- Class 100 cleanroom assembly, testing, and packaging
- No preventative maintenance during two-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

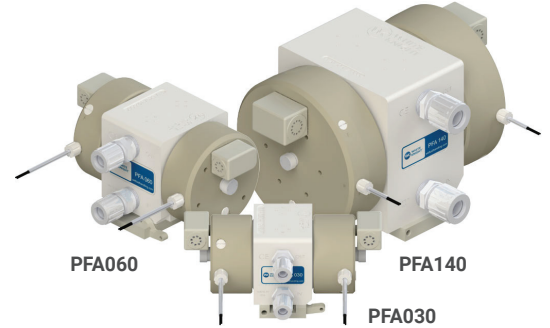
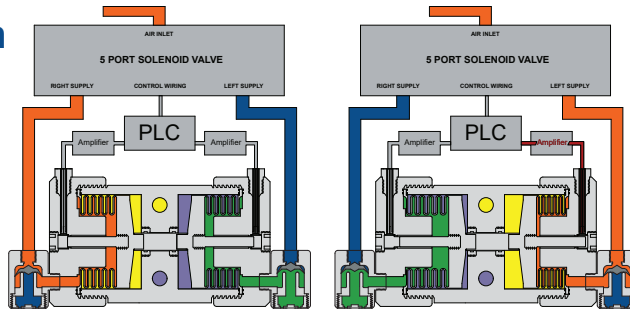
<https://wkfluidhandling.com/pfa-series/>



### Operation

A solenoid valve and fiber optics monitor stroke timing to optimize liquid flow and pump durability.

See online animation.

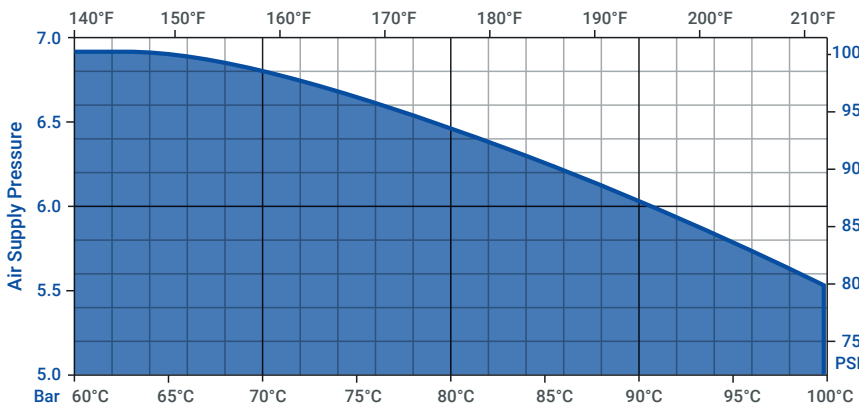


### Configuration

**PFA 060 - F 12** **LFO - SFD0 - T P 08 - A -**  
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ A (optional)

- ① **Pump Model**  
PFA = Standard  
PFASD = Dry-run capable
- ① **Pump Size (max discharge)**  
015 = 15 lpm (4 gpm)  
030 = 30 lpm (8 gpm)  
060 = 60 lpm (16 gpm)  
140 = 140 lpm (36 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  
24 = 1-1/2 in
- ⑤ **Leak Detection** (optional)  
LFO = 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 (\*Required for operation)**  
*Dual Probe*  
SFD0 = 15 ft fiber optic cable, no amplifier  
SFD1 = 15 ft fiber optic cable, D10 amplifier  
SFD2 = 25 ft fiber optic cable, no amplifier  
SPD3 = 25 ft fiber optic cable, D10 amplifier  
*Single Probe, Dual Detect*  
SFS = Single probe, dual detect, no fibers  
SFD0 = 15 ft fiber optic cable, no amplifier  
SFD1 = 15 ft fiber optic cable, D10 amplifier  
SFD2 = 25 ft fiber optic cable, no amplifier  
SPD3 = 25 ft fiber optic cable, D10 amplifier
- 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 **Quick Exhaust/Air Inlet**  
A = 5/16 in NPT Adapter

### Temperature Limitations



### Specifications

Model	PFA015	PFA030	PFA060	PFA140	
<b>Max Flow Rate*</b>	12.8 lpm (3.38 gpm)	25.7 lpm (6.79 gpm)	66.1 lpm (17.46 gpm)	146.7 lpm (38.75 gpm)	
<b>Displacement Per Cycle*</b>	0.089 liters (0.024 gal)	0.089 liters (0.024 gal)	0.216 liters (0.057 gal)	0.500 liters (0.132 gal)	
<b>Cycles per min</b>	≤ 190	≤ 336	≤ 318	≤ 233	
<b>Air Connection</b>	1/4 in FNPT	1/4 in FNPT	1/4 in FNPT	3/8 in FNPT	
<b>Weight</b>	2.4 kg (5.3 lb)	2.4 kg (5.3 lb)	4.7 kg (10.4 lb)	15.6 kg (34.4 lb)	
<b>Suction Lift*</b>	≤ 3 m (10 ft)	≤ 3 m (10 ft)	≤ 3 m (10 ft)	≤ 3 m (10 ft)	
<b>Sound</b>	<b>Pressure**</b>	69.54 dB(a)	69.54 dB(a)	82.74 dB(a)	81.98 dB(a)
		66.58 dB(a)	66.58 dB(a)	82.61 dB(a)	91.60 dB(a)
<b>Power**</b>	58.44 dB(a)	58.44 dB(a)	71.92 dB(a)	76.37 dB(a)	
	65.52 dB(a)	65.52 dB(a)	73.84 dB(a)	83.16 dB(a)	

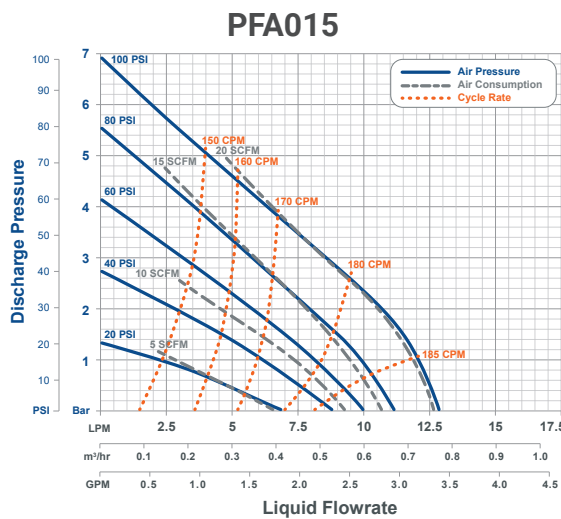
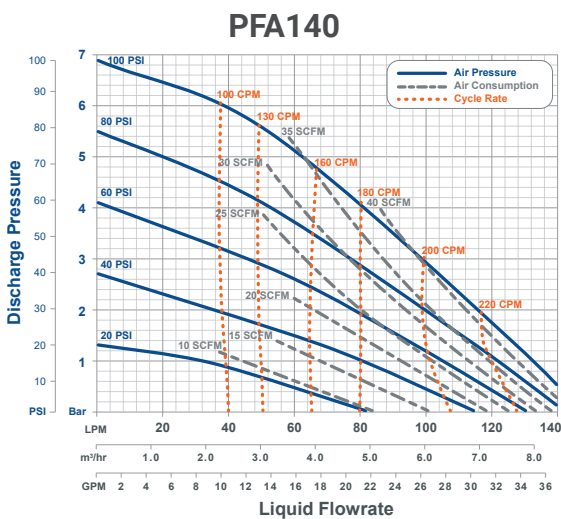
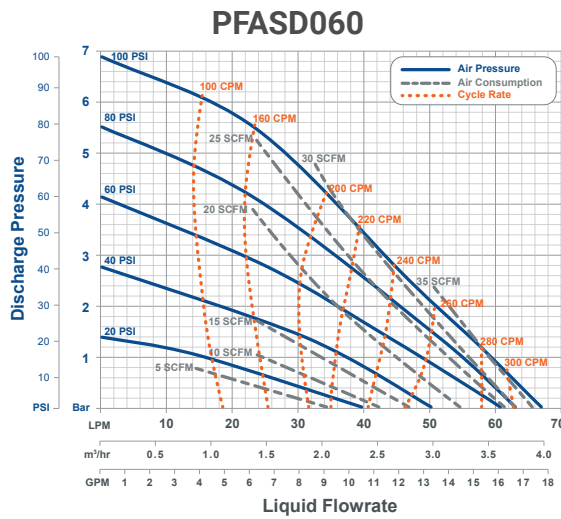
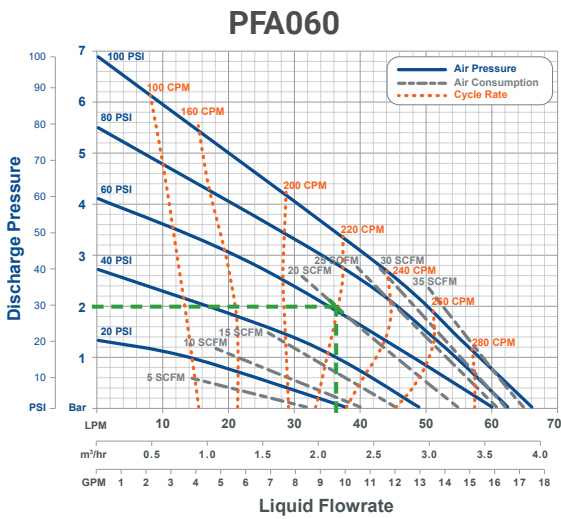
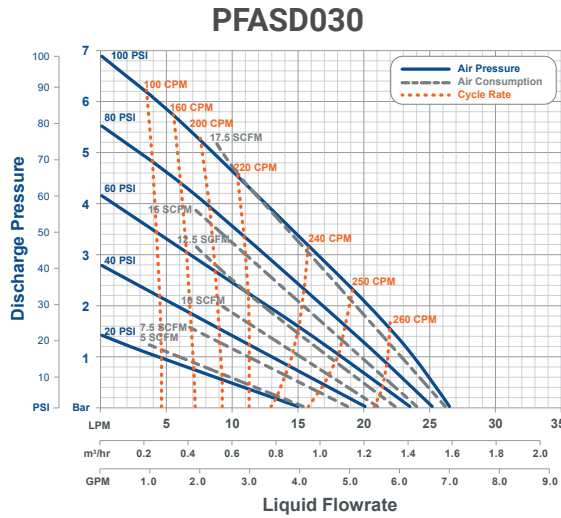
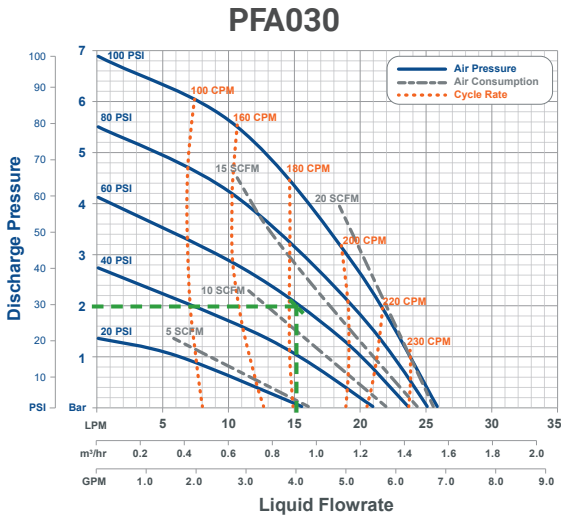
<b>Stroke Detection</b>	Fiber optic with or without D10 sensor	<b>Max Fluid Temperature</b>	100°C (212°F)
<b>Leak Detection</b>	Fiber optic with or without sensor, or conductivity	<b>Max Supply Air Pressure</b>	7 Bar (100 psi)
<b>Electronic Control</b>	CPC, CPT, or custom. Call for details.	<b>Min Startup Air Pressure</b>	1.4 Bar (20 psi)
		<b>Fluid Path Materials</b>	PTFE, PFA
		<b>Non-Fluid Path Materials</b>	PTFE, PFA, PP

\* 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 at 100 psi 50 CPM (top) and 100 psi max. CPM (bottom). Sound levels measured in accordance with ISO9614-2:1997.  
 \*\*\*Dry-run capable PFASD pumps require flooded suction, and may have a reduced warranty. Contact White Knight for details.

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 pump in timer mode requires end-of-stroke detection to prevent over stroking. Operating a pump in timer mode without stroke detection voids the warranty. Operating pump without quick exhaust valves voids warranty. Customers may use NPT adapter and supply their own QEVs. Contact White Knight for copy exact information.



**Performance**



**Reading Charts**

Draw a horizontal line from your discharge pressure and a vertical line through your desired flow rate. At their intersection, estimate required air supply pressure, cycle rate and air consumption.

See green dashed lines in PFA030 and PFA060 charts for examples.

**Example 1**

At 2 Bar (30 psi) liquid discharge pressure and 60 psi supply pressure, PFA030 pumps provide 15 lpm (4 gpm) liquid flow rate. They would cycle at 185 CPM, and exhaust 12 SCFM of air.

**Example 2**

At 2 Bar (30 psi) liquid discharge pressure and 60 psi supply pressure, PFA060 pumps provide 36 lpm (9.8 gpm) flow rates. They would cycle at 220 CPM and exhaust 20 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.

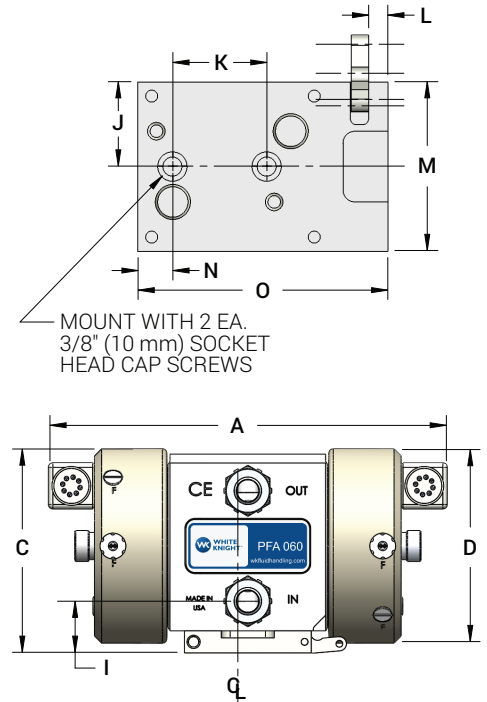
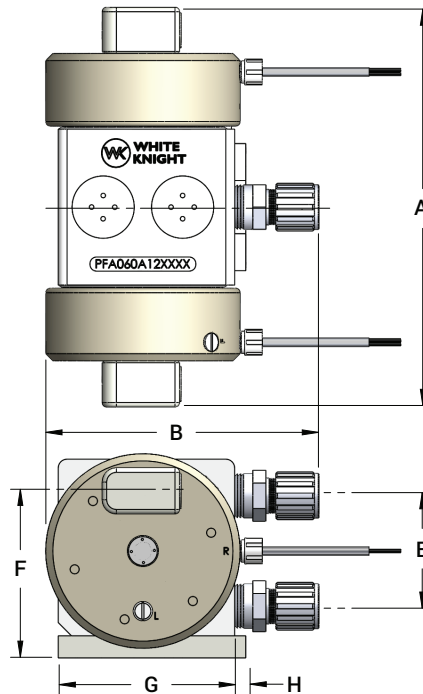
**Dimensions**

mm (inches)

	PFA015	PFA030	PFA060	PFA140
A	263 (10.4)	263 (10.4)	287 (11.3)	383 (15.1)
B	154 (6.1)	154 (6.1)	197 (7.7)	277 (10.9)
C	116 (4.6)	116 (4.6)	147 (5.8)	233 (9.2)
D	∅105 (4.1)	∅105 (4.1)	∅140 (5.5)	∅222 (8.7)
E	57 (2.2)	57 (2.2)	79 (3.1)	138 (5.4)
F	100 (3.9)	100 (3.9)	120 (4.7)	192 (7.6)
G	100 (3.9)	100 (3.9)	127 (5.0)	206 (8.1)
H	8 (0.3)	8 (0.3)	8 (0.3)	8 (0.3)
I	32 (1.3)	32 (1.3)	37 (1.5)	53 (2.1)
J	31 (1.2)	31 (1.2)	46 (1.8)	47 (1.8)
K	51 (2.0)	51 (2.0)	51 (2.0)	51 (2.0)
L	11 (0.4)	11 (0.4)	10 (0.4)	11 (0.4)
M	62 (2.5)	62 (2.5)	91 (3.6)	94 (3.7)
N	25 (1.0)	25 (1.0)	19 (0.7)	57 (2.2)
O	111 (4.4)	111 (4.4)	135 (5.3)	215 (8.4)

Rigid baseplate available. Call for details.

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



**White Knight Accessories**

**Ultrapure Closed-Loop Systems**

Automatically control flow or pressure with metal-free systems capable of 210°C, dead-head and suction lift!



Automatically maintain flow or pressure in ultrapure chemical process and delivery systems. Simplify process automation to save time and resources, improve yields and reduce cost.

<https://wkfluidhandling.com/closed-loop/>

- ⊙ Up to 210°C (410°F)
- ⊙ No metals or elastomers
- ⊙ No heat generation
- ⊙ No O-rings or lubrication
- ⊙ Suction lift & dead-head

**Pulse Dampeners**

Reduce pulsation in fluid systems to improve flow control, increase yields, protect fittings and pipes, and minimize downtime for repairs.

<https://wkfluidhandling.com/dampeners/>



**Pressure Regulators**

Control upstream or downstream pressure! A single back-pressure regulator equalizes upstream fluid pressure across multiple discharge outlets. Forward-pressure regulators control downstream pressure.

<https://wkfluidhandling.com/regulators/>



**Cycle-Rate Translator**

The CPT enables pump replacements in existing tools. It operates a White Knight pump at its optimal cycle rate and scales the operational cycle rate to that expected by the tool.

<https://wkfluidhandling.com/cpt/>