

PSD08 Owner's Manual



CE

Table of Contents

1 Introduction.....	1
2 Specifications & Performance	2
2.1 Pump Specifications	2
2.2 PSD08 Performance Curves	3
2.3 PSD08 Dimensional Drawing	4
2.4 PSD08 Exploded View Drawing.....	5
3 Installation	7
3.1 Installation Precautions	7
3.2 PSD Installation Advantages.....	8
3.3 System and Pump Environment.....	8
3.4 Control and Monitoring Connections	9
3.5 PSD 08 Installation Instructions	10
4 Pump Service & Rebuilds.....	11
4.1 PSD Ordering instructions.....	11
4.2 PSD08 Rebuild Kit Ordering Instructions	12
4.3 Alternative Wet Kit Ordering Instructions	15
4.4 Tools.....	16
4.5 Torque Instructions.....	16
4.6 Disassembly instructions.....	17
4.7 Assembly Instructions	18
5 Accessories	19
6 Warranty	20
7 Certificate & Declaration of Conformity	21

Manual content and data are subject to change without notification.
Manuals available online at: wkfluidhandling.com/owners-manuals

1 Introduction

Thank You for Purchasing White Knight Products

You have purchased a White Knight product that has been designed to our exacting specifications and built by a team of technicians with the highest commitment to quality!

White Knight is the world leader in zero-metal, ultra-high purity pumps and continues to drive the industry with new technology and products. Since the inception of White Knight in 1995, we have been awarded over 14 US design patents and have multiple other patents pending! White Knight currently produces over 30 sizes/models of pumps in varying materials to meet our customers' stringent requirements in numerous applications, including ultra-high temperature re-circulation; high pressure chemical delivery systems, slurry, industrial chemical, and industrial applications.

White Knight has received many prestigious awards for its designs and continues to lead the industry in quality because White Knight controls the manufacturing process from raw materials to finished goods in our facility located in Kamas, UT. This allows us to rigorously manage our quality control process to ensure that our strict cleanliness procedures are always followed and that components are built under consistent methods and conditions for maximum reliability.

Our strict manufacturing process controls include assembling and testing White Knight products in a clean environment. White Knight products also pass a battery of functional tests to ensure operational integrity.

Before installing your White Knight product, please carefully review the product manual. There are many helpful hints and ways to optimize the setup and use of your White Knight product as well as instructions and requirements for installation. In addition, you will also find many accessories in the manual that will enhance the functionality of your White Knight product.

Our team has gone to great lengths to provide you with the highest quality products at the best value and we back them up with excellent warranties and world class support! We hope you agree our products will serve your exacting needs and meet your stringent requirements every time you purchase a White Knight Product.

Sincerely,

Brian Callahan
President
White Knight Fluid Handling

2 Specifications & Performance

2.1 Pump Specifications

PSD08 Pump Performance Specification ¹								
Flow Rate	Theoretical Displacement Per Cycle	Suction Lift Wet	Suction Lift Dry	Sound Pressure ³ dB(a)	Sound Power ³ dB(a)	Max. Size of Passible Solids ⁴	Max Operating Temperature	Air Supply Pressure Limits ⁵
63 lpm (16.6 gpm)	0.160 L (0.42 gal)	9.5 L (31.2 ft ²)	3.3 m (10.8 ft)	66.67 82.04	54.45 74.75	4 mm 0.16 in	100°C TE 70°C UH	30 psi (100 psi)

All tests performed with water at ambient temperatures and PTFE check balls

1. Pump Specifications are subject to change based on configuration ordered
2. Suction lift diminishes with wear of pump, minimize suction lift to maximize performance
3. dB Level at 100 psi 50CPM (top) and 100 psi maximum CPM (bottom).
4. The passing of solids may shorten the life of a pump
5. Minimum startup pressure (Max supply pressure)

STORAGE

PSD pumps that are not put into operation upon delivery must be stored in an environment where they are protected from moisture, extreme temperatures, UV radiation, vibration, and should be kept clean. White Knight recommends an environment of ambient temperature (between 60° F (15°C) and 80°F (25°C)) with a humidity level below 65%.

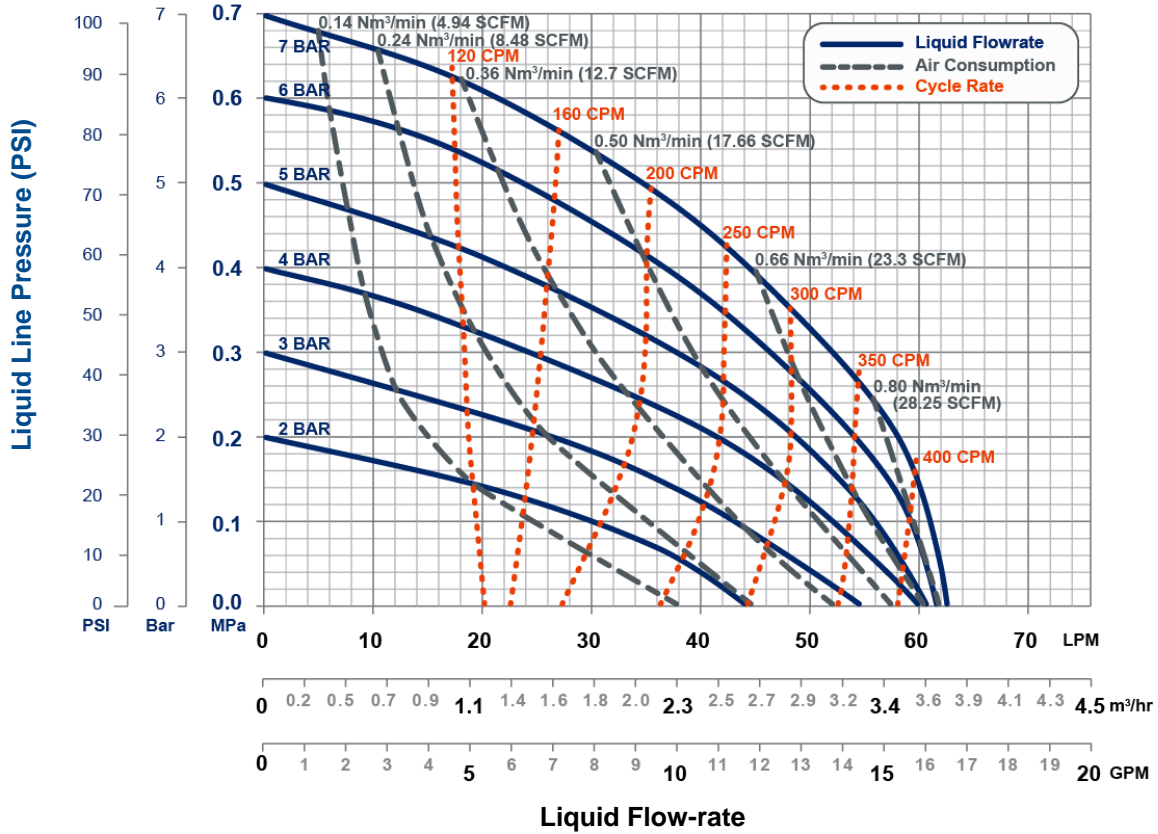
Maintenance and Torque Values

Upon installation of the pump, as well as after a few hours of operating the pump, the head and manifold bolts must be re-torqued. Tie bolts and manifold bolts must be re-torqued to values specified in the table below. Re-torquing will be required after the pump has set for extended periods of time, run in thermal cycling applications, been dismantled, or when there is a large difference between environmental temperatures and fluid temperatures. See torquing instructions on page 17.

	Assembly Torque in-lbs. (kg-cm)	Re-torque Spec in-lbs. (kg-cm)
Tie Bolts	60 (69.1)	55 (63.4)
Manifold Bolts	40 (46.1)	35 (40.3)

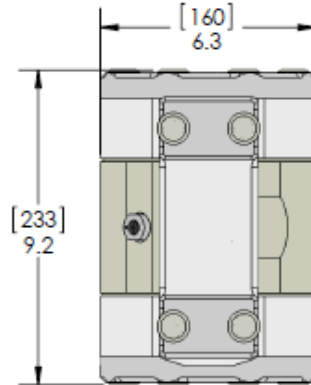
2.2 PSD08 Performance Curves

PSD08 Performance Curves

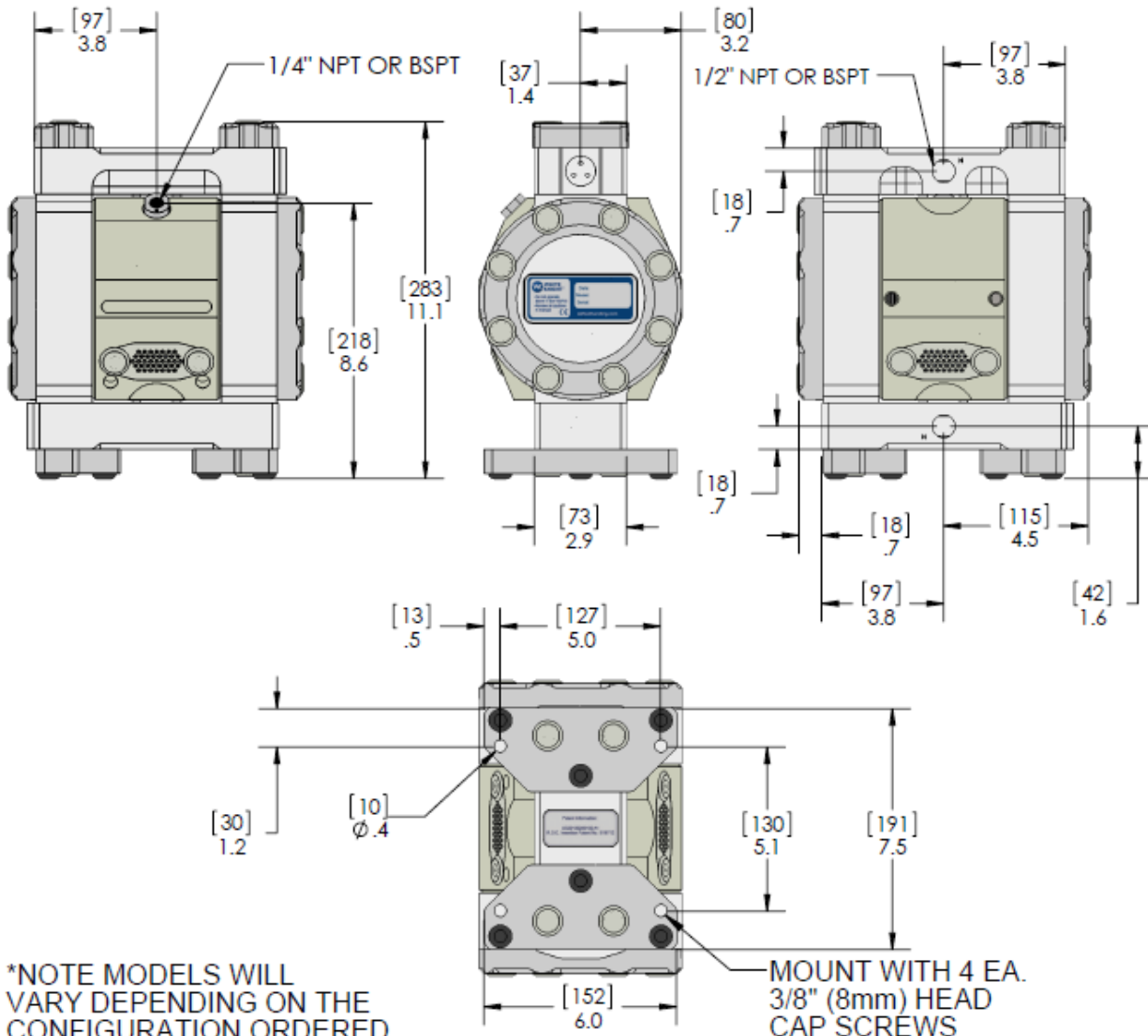


2.3 PSD08 Dimensional Drawing

PSD08

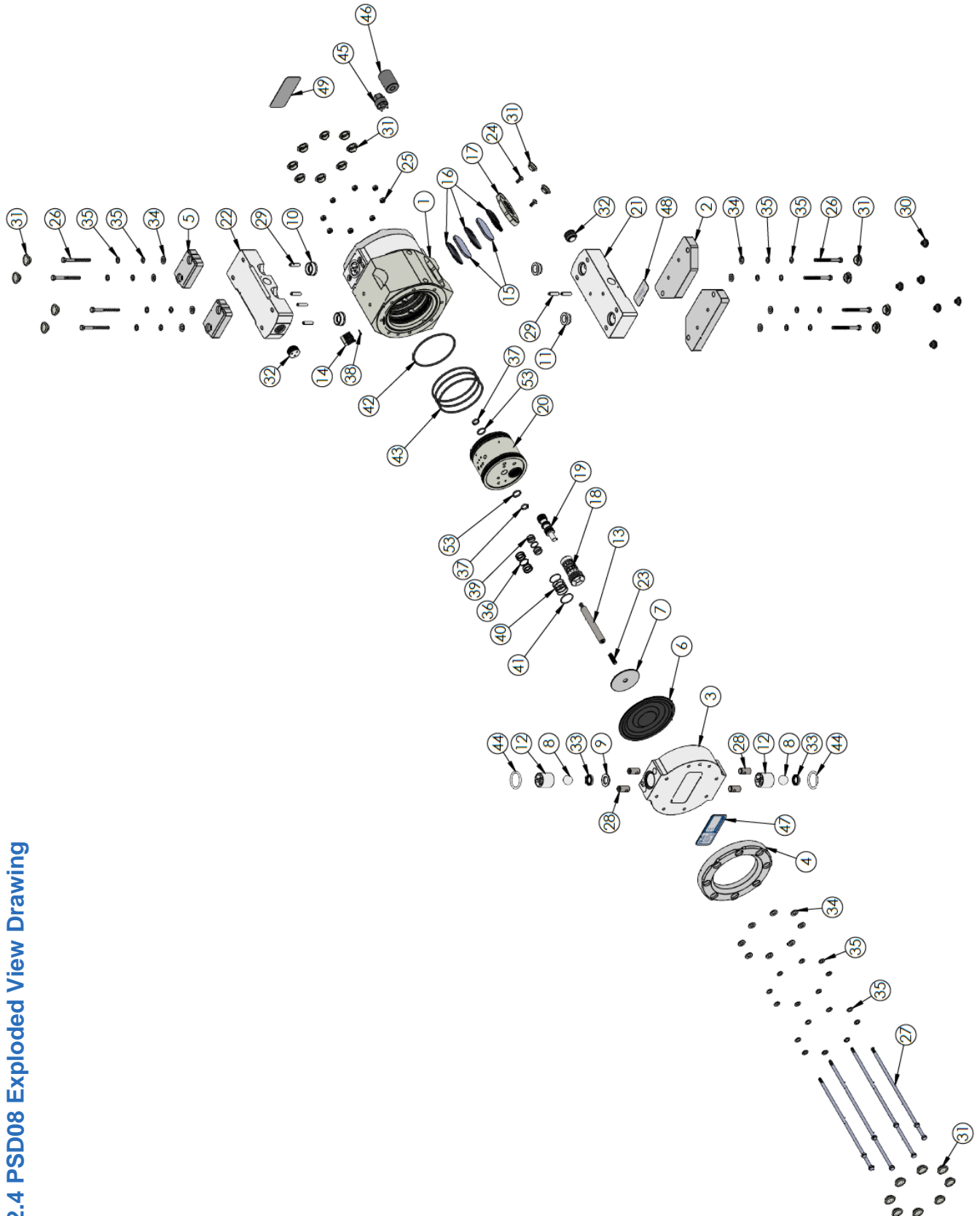


MAIN DIMENSIONS ARE INCHES,
 [BRACKETED] DIMENSIONS ARE mm.



*NOTE MODELS WILL VARY DEPENDING ON THE CONFIGURATION ORDERED.

MOUNT WITH 4 EA. 3/8" (8mm) HEAD CAP SCREWS



2.4 PSD08 Exploded View Drawing

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	1125-NP-0001	BODY	1	21_B	7500-UH-0005	INLET MANIFOLD, 1/2" BSPT	
2	1146-PV-0002	BASE PLATE	2	22_N	7500-TE-0002	OUTLET MANIFOLD, 1/2" NPT	1
3	2127-TE-0049	HEAD PSD08	2	22_B	7500-TE-0006	OUTLET MANIFOLD, 1/2" BSPT	
3	2127-UH-0001	HEAD PSD08		22_N	7500-UH-0002	OUTLET MANIFOLD, 1/2" NPT	
4	2129-PV-0001	HEAD RETAINER	2	22_B	7500-UH-0006	OUTLET MANIFOLD, 1/2" BSPT	
5	2129-PV-0002	MANIFOLD RETAINER	2	23	10010-SS-0006	THREADED STUD	2
6_E	3200-EM-0001	DIAPHRAGM PSD08	2	24	10010-SS-0010	SCREW	4
6_O	3200-TE-0001	DIAPHRAGM PSD08		25	10010-SS-0013	NUT	6
6_N	3200-BN-0001	DIAPHRAGM PSD08		26	10010-SS-0014	SCREW	8
7	3300-SS-0004	STRIKE PLATE PSD08	2	27	10010-SS-0106	TIE HEX BOLT	8
8_T	4100-TE-0002	CHECK BALL 3/4"	4	28	10011-SS-0002	MANIFOLD NUT	8
8_E	4100-EM-0001	CHECK BALL 3/4"		29	10020-WC-0001	GUIDE PIN	6
8_S	4100-SS-0001	CHECK BALL 3/4"		30	10040-NB-0001	FOOT RUBBER	6
8_N	4100-NB-0001	CHECK BALL 3/4"		31	10040-PE-0009	CAP PLUG	28
9	4135-TE-0011	WEARABLE SEAT, PSD08	2	32	10040-TE-0012	1/2" PLUG	2
9	4135-UH-0003	WEARABLE SEAT, PSD08		33	10050-MP-0002	D-RING	4
10	4135-TE-0013	TOP MANIFOLD WEAR SEAT	2	33	10050-UH-0005	D-RING	
10	4135-UH-0005	TOP MANIFOLD WEAR SEAT		34	10050-SS-0002	WASHER	24
11	4135-TE-0014	BOTTOM MANIFOLD WEAR SEAT	2	35	10050-SS-0005	WASHER, BELLEVILLE	48
11	4135-UH-0006	BOTTOM MANIFOLD WEAR SEAT		36	10050-UH-0003	GLIDE SEAL	10
12	4137-TE-0004	CHECK CAGE PSD08	4	37	10050-UH-0004	GLIDE SEAL	2
12	4137-UH-0001	CHECK CAGE PSD08		38	10080-EM-012-70	012 O-RING	1
13	5144-SS-0001	SHAFT	1	39	10080-EM-015-70	015 O-RING	10
14_N	6060-NP-0005	1/4" NPT INLET ADAPTER	1	40	10080-EM-020-70	020 O-RING	10
14_B	6060-NP-0006	1/4" BSPT INLET ADAPTER		41	10080-EM-022-70	022 O-RING	2
15	6140-FP-0006	BAFFLE	4	42	10080-EM-113-70	113 O-RING	2
16	6140-PP-0001	SPACER BAFFLE	6	43	10080-EM-238-70	238 O-RING	1
17	6150-NP-0009	MUFFLER CAP	2	44	10080-EM-240-70	240 O-RING	3
18	6550-PT-0001	SLEEVE	2	45	10080-TE-217	217 O-RING	4
19	6560-PT-0001	SPOOL	2	46	12100-PV-0030	SLEEVE WRENCH	1
20	6600-NP-0001	AIR MOTOR	1	47	12100-PV-0031	WEAR SEAT INSTALLATION TOOL	1
21_N	7500-TE-0001	INLET MANIFOLD, 1/2" NPT	1	48	19100-PP-0058	LABEL, CE FOR PSD08,16, AND 24	1
21_B	7500-TE-0005	INLET MANIFOLD, 1/2" BSPT		49	19100-PP-0124	PSD08/16/24 PATENT STICKER	1
21_N	7500-UH-0001	INLET MANIFOLD, 1/2" NPT		50	19100-PP-0037	LABEL, PRODUCT, PSD08	1
		PTFE Configuration					
		UHMW Configuration					

3 Installation

3.1 Installation Precautions

Required Air Flow and Operating Pressure
Required Air Flow for the PSD08 is 1/4" minimum orifice unrestricted. An adaptor is included for 1/4"NPT or 1/4" BSPT with all pumps, NPT or BSPT is decided on based on the liquid fittings requested. Max air supply for the PSD08 is 7 Bar (100 PSI).
Restriction of Liquid Inlet Line
Restricting the liquid supply of the pump forces the pump to work harder than normal and should be avoided whenever possible, especially when pumping viscous liquids. Attempting to operate the pump against a closed liquid inlet will cause serious damage to the pump, and will void the warranty. If you wish to slow or stop your pump this may be done by closing off the liquid outlet.
Supply Pressure Recommendations
The life of your pump may be extended significantly by operating your pump 30%-40% below redline operating supply pressures. The use of undersized regulators, valves, and supply lines can decrease pump performance and longevity significantly.
Orientation
White Knight does not recommend installing your pump in any position other than its upright position. Check valves within White Knight PSD pumps are actuated by gravity and/or flow and perform optimally in the upright position.
Failure Potential
It is possible that the diaphragm may fail. In such a situation it is possible that chemical could enter the air side of the pump, and may even escape through the muffler. In such a situation the muffler media must be replaced and the air side purged. White Knight recommends the implementation of a one way valve on the air side to protect air lines from contamination in the event of a diaphragm failure.
Muffler
Pump performance may be restricted in the event of a clogged muffler. Regular inspection of air lines and muffler media is recommended to maintain performance.
Product Testing
Each pump is tested before being packaged for shipment. White Knight recommends the flushing of each pump before servicing if water can contaminate the process.

3.2 PSD Installation Advantages

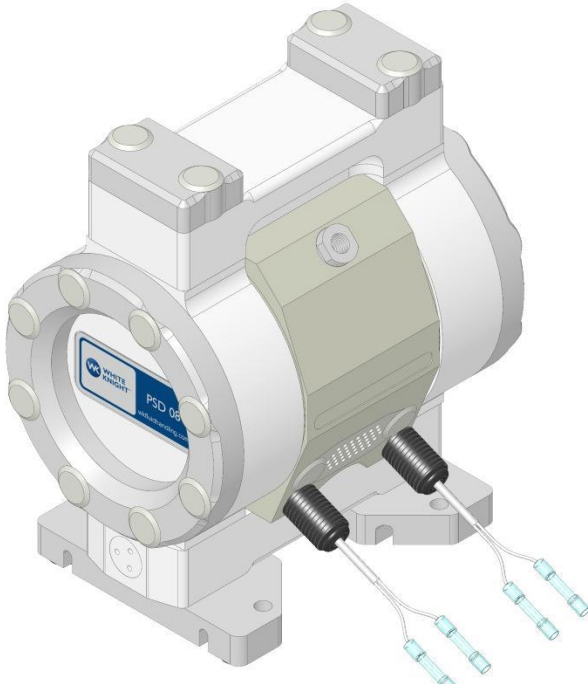
Head Pressure / Dead-Head
White Knight PSD pumps may be controlled by opening and closing the outlet of the pump and may be installed in any head pressure situation up to dead-head. Dead-head occurs when air supply pressure and the liquid line (head) pressure are equal. Dead-head conditions allow for no flow. Under dead-head conditions the PSD will cease to cycle (limiting wear) until conditions change allowing for flow.
Passing Solids
All damage caused by passing solids (wafer shards, etc.) is coverable under warranty when your pump is used in conjunction with a White Knight Catcher™ pre-pump filter.
Running Dry
White Knight PSD pumps are capable of running dry without damage other than normal wear to the pump. When a pump is run dry it cycles faster than normal, accelerating the rate of normal wear.

3.3 System and Pump Environment

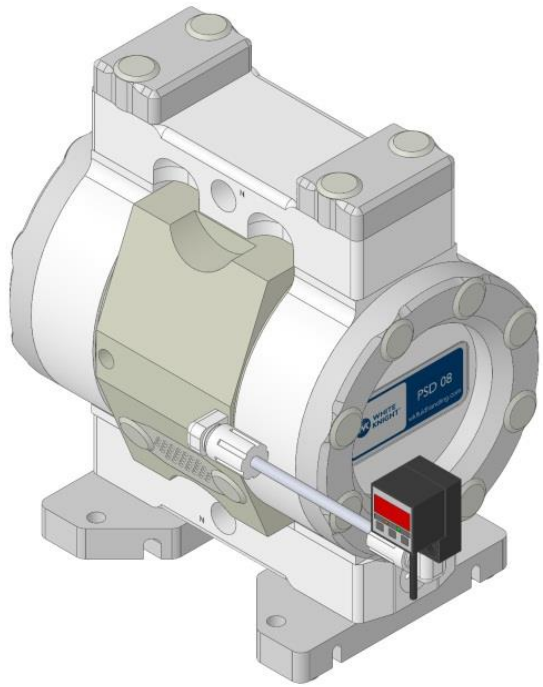
Clean Dry Supply Air (CDA)
Operation of the point of 5 PSD08 requires class 4 quality air for particles, moisture, and oils. (maximum particle size 15 microns, 3° C Dew 5 mg/m³) per ISO8573 – 1.
Flammable Solvents
Any system used to pump flammable solvents should be properly grounded. A test from River’s Edge on using isolative pumps to pump flammable liquids indicated that the liquid itself must be grounded and that other procedures should be followed. A copy of the test is available upon request from White Knight.
Abrasive Slurries
For slurry applications White Knight recommends use of the PSD UH pump.
Pumping Liquids Near Boiling Point
The boiling point of a liquid is reduced under vacuum (suction) conditions. Due to the vacuum caused by a pump, liquid could boil in the inlet line of the pump when it is not boiling in the tank (or other supply reservoir). Placing the pump as close as possible to the tank and with as little vertical lift as possible (the pump being flooded by gravity is ideal) minimizes boiling in the inlet line. Boiling of the liquid in the inlet line causes a pump to “race” and accelerates the wear of the pump. Boiling liquids may cause cavitation to occur. Damage to wearable or non-wearable components of the pump caused by cavitation is not covered under warranty.
Running a Submerged Pump
When running the PSD in submerged mode, the exhaust air must be sealed and redirected above the surface of the media. Take care that all pump parts (air side and wet side) are resistant to the media being used. It may be necessary to mount the pump to the bottom of the tank. Operating this pump while submerged requires use of a remote muffler adaptor kit.
Temperature
The PSD may be operated safely in low temperature applications. Take care to avoid freezing or crystallization of the fluid inside or outside of the pump. Running the pump at temperatures below freezing may accelerate the wear of the elastomer components within the pump. In applications where the media or pump temperature varies, torque values (tension) of the manifold and head bolts must be monitored. TE versions of the PSD Series pumps can be operated at temperatures up to 100°C (212° F) UH versions of the PSD Series pumps can be operated at temperatures up to 70°C (158°F)

3.4 Control and Monitoring Connections

- **PUMP MONITORING:** Pump monitoring can be performed by solid state pressure switch monitoring. This option is described on our website in the accessories section and is available for new orders and for retrofits in the field.



Conductivity Leak Detection



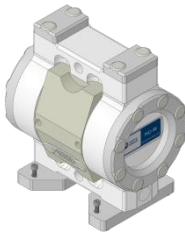
Pressure Switch Stroke Detection

- **Pump Control:** Run mode and flow rate are two of the items which the **CPT-1** can control/monitor.



3.5 PSD 08 Installation Instructions

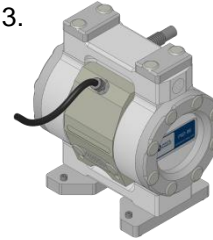
1.



2.



3.

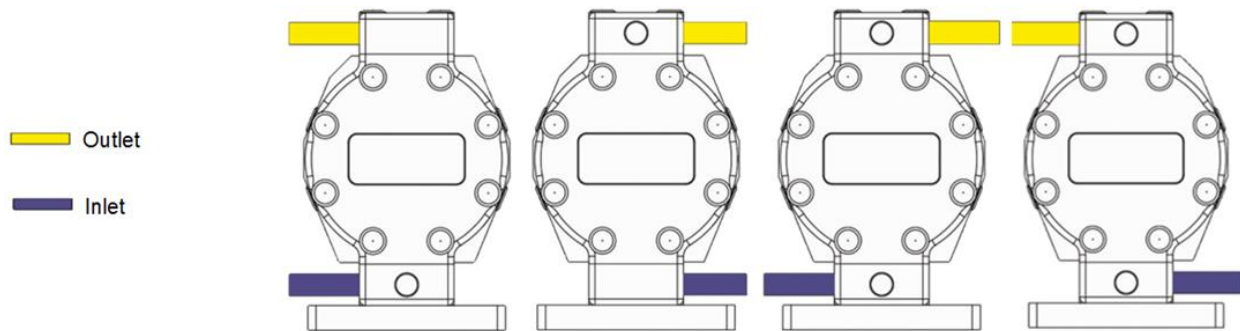


Air supply port in pump body is ¼" NPT.

For ¼" BSPT use supplied adaptor.

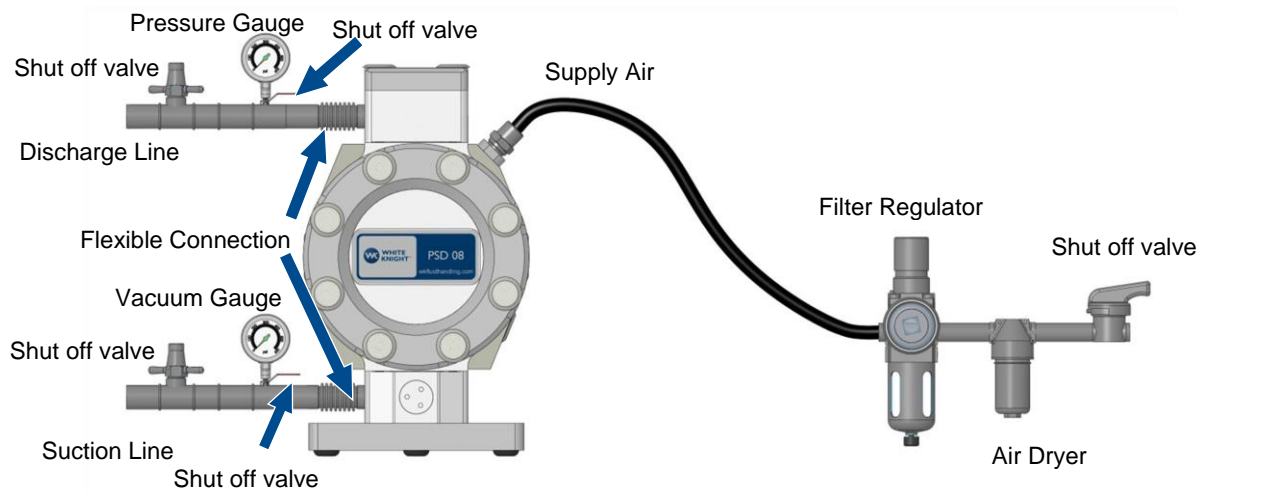
- Fix base plate to work station with four 3/8" or 10 mm bolts. (Bolts not included.)
- Attach ½" liquid fittings to pump. Excessive force may damage threads.
- Ensure airline is free of solids before attaching. Supply air via ¼" NPT air fitting with flexible connection.

Inlet/Outlet Configurations



Some configurations require re-orientation of crossover manifolds. See Disassembly and Assembly Instructions.

Recommended Set Up

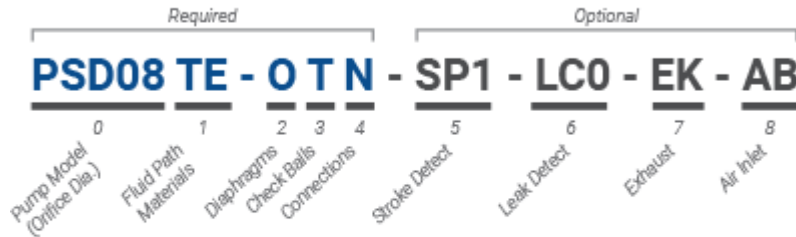


Caution: Closing suction line while pump is operating will cause irreversible damage to the pump.

4 Pump Service & Rebuilds

4.1 PSD Ordering instructions

Configuration



Instructions

Options 0-4 are required. Options 5-8 are not required.
 Contact support for revision or copy exact information.

Standard options are highlighted

0. Pump Model <i>(determined by orifice diameter)</i>	
1/4-inch orifice	PSD04
3/8-inch orifice	PSD06
1/2-inch orifice	PSD08
1-inch orifice	PSD16
1-1/2-inch orifice	PSD24

1. Fluid Path	
PTFE	TE
PE (UHMW)	UH

2. Diaphragms	
Over-Molded PTFE/EPDM	O
EPDM	E
NBR	N

3. Check Balls	
PTFE	T

4. Connections			Connection Compatibility				
			PSD04	PSD06	PSD08	PSD16	PSD24
NPT (same diameter as orifice)			N	✓	✓	✓	✓
BSPT (same diameter as orifice)			B	✓	✓	✓	✓
Flaretek Compatible 	1/4 in.	F04	✓	✓	-	-	-
	3/8 in.	F06	✓	✓	-	-	-
	1/2 in.	F08	-	✓	✓	✓	-
	3/4 in.	F12	-	✓	✓	✓	-
	1 in.	F16	-	-	✓	✓	-
	1-1/4 in.	F20	-	-	✓	✓	-
Pillar S-300 	1/4 in.	P04	✓	✓	-	-	-
	3/8 in.	P06	✓	✓	✓	-	-
	1/2 in.	P08	-	✓	✓	✓	-
	3/4 in.	P12	-	-	✓	✓	-
	1 in.	P16	-	-	✓	✓	-
	1-1/4 in.	P20	-	-	-	✓	-
Primelock 	1/2 in.	L08	-	✓	✓	-	-
	3/4 in.	L12	-	✓	✓	-	-
	1 in.	L16	-	-	✓	✓	-
	1-1/4 in.	L20	-	-	-	✓	-
Tube Adapter 	3/8 in.	T06	-	✓	-	-	-
	1/2 in.	T08	-	✓	✓	-	-
	3/4 in.	T12	-	✓	✓	✓	-
	1 in.	T16	-	-	✓	✓	-
	1-1/4 in.	T20	-	-	✓	✓	-
	1-1/2 in.	T24	-	-	-	✓	-
Weldable 	1/2 in.	W08	-	✓	-	-	-
	3/4 in.	W12	-	✓	✓	✓	-
	1 in.	W16	-	-	✓	✓	-

5. Stroke Detection	
No Stroke Detection	blank
Pressure Switch (NPN)	SP1
Pressure Switch (PNP)	SP4

6. Leak Detection	
No Lead Detection	blank
15 ft. Conductivity Cable	LC0
25 Ft. Conductivity Cable	LC1

7. Exhaust	
Standard Exhaust	blank
Remote Exhaust Kit	EK

8. Air Inlet	
NPT Air Inlet	blank
BSPT Air Inlet	AB

4.2 PSD08 Rebuild Kit Ordering Instructions

PSD08 Rebuild Kits

Part Name	Part Number
PSD08 Dry Rebuild Kit	RBPSD08-1
PSD08 Alt Dry Rebuild Kit (With Air Motor Assembly)	RBPSD08-2
PSD08TE-OT Wet Rebuild Kit	RBPSD08TE-OT
PSD08TE-ET Wet Rebuild Kit	RBPSD08TE-ET
PSD08TE-NT Wet Rebuild Kit	RBPSD08TE-NT
PSD08UH-OT Wet Rebuild Kit	RBPSD08UH-OT
PSD08UH-ET Wet Rebuild Kit	RBPSD08UH-ET
PSD08UH-NT Wet Rebuild Kit	RBPSD08UH-NT
PSD08TE-OT Combined Rebuild Kit	RBPSD08TE-OT-1*
PSD08TE-ET Combined Rebuild Kit	RBPSD08TE-ET-1*
PSD08TE-NT Combined Rebuild Kit	RBPSD08TE-NT-1*
PSD08UH-OT Combined Rebuild Kit	RBPSD08UH-OT-1*
PSD08UH-ET Combined Rebuild Kit	RBPSD08UH-ET-1*
PSD08UH-NT Combined Rebuild Kit	RBPSD08UH-NT-1*
PSD08TE-OT Alt. Combined Rebuild Kit	RBPSD08TE-OT-2**
PSD08TE-ET Alt. Combined Rebuild Kit	RBPSD08TE-ET-2**
PSD08TE-NT Alt. Combined Rebuild Kit	RBPSD08TE-NT-2**
PSD08UH-OT Alt. Combined Rebuild Kit	RBPSD08UH-OT-2**
PSD08UH-ET Alt. Combined Rebuild Kit	RBPSD08UH-ET-2**
PSD08UH-NT Alt. Combined Rebuild Kit	RBPSD08UH-NT-2**

*Contains all parts of RBPSD08-1 and applicable wet kit

**Contains all parts of RBPSD08-2 and applicable wet kit

Parts included in the PSD08-1 Rebuild Kit

Part Number	Description	Quantity
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
6140-FP-0006	Baffle, Porous Poly, PSD08/16	4
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	5
14850-PT-0002	Spool/Sleeve Assembly for WL Pump PSD08	2

Parts included in the RBPSD08-2 Rebuild Kit

Part Number	Description	Quantity
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
6140-FP-0006	Baffle, Porous Poly, PSD08/16	5
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	5
14860-NP-0001	PSD08 Air Motor Assembly	1
10080-EM-240-70	#240 EPDM O-ring Seal	3
10080-EM-238-70	#238 EPDM O-ring Seal	1

Parts included in the RBPSD08TE-OT Rebuild Kit

Part Number	Description	Quantity
5144-SS-0001	Diaphragm Shaft for WK Pump, PSD08	1
3200-TE-0001	Diaphragm for WK Pump, PSD08, PTFE	2
10010-SS-0006	Stud, Threaded	2
3300-SS-0004	Strike Plate for WK Pump, PSD08	2
4100-TE-0002	3/4" Check Ball for WK Pump, PSD08, PTFE	4
4137-TE-0004	Retainer, Ball, 3/4", PTFE	4
10050-MP-0002	D-Ring	4
4135-TE-0011	PSD08TE Wear seat	2
4135-TE-0013	PSD08TE Top Manifold Wear Seat	2
4135-TE-0014	Bottom Manifold Wear Seat, PSD08TE	2
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	24
10080-TE-217	O-ring, PTFE, 217	4
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
10080-EM-113-50	#113 EPDM O-ring Seal	2
10050-UH-0004	Shaft Glide Seal for WK Pump PSD08	2

Parts included in the RBPSD08TE-ET Rebuild Kit

Part Number	Description	Quantity
5144-SS-0001	Diaphragm Shaft for WK Pump, PSD08	1
3200-EM-0001	Diaphragm for WK Pump, PSD08, EPDM	2
10010-SS-0006	Stud, Threaded	2
3300-SS-0004	Strike Plate for WK Pump, PSD08	2
4100-TE-0002	3/4" Check Ball for WK Pump, PSD08, PTFE	4
4137-TE-0004	Retainer, Ball, 3/4", PTFE	4
10050-MP-0002	D-Ring	4
4135-TE-0011	PSD08TE Wear seat	2
4135-TE-0013	PSD08TE Top Manifold Wear Seat	2
4135-TE-0014	Bottom Manifold Wear Seat, PSD08TE	2
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	24
10080-TE-217	O-ring, PTFE, 217	4
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
10080-EM-113-50	#113 EPDM O-ring Seal	2
10050-UH-0004	Shaft Glide Seal for WK Pump PSD08	2

Parts included in the RBPSD08TE-NT Rebuild Kit

Part Number	Description	Quantity
5144-SS-0001	Diaphragm Shaft for WK Pump, PSD08	1
3200-BN-0001	Diaphragm for WK Pump, PSD08, NBR	2
10010-SS-0006	Stud, Threaded	2
3300-SS-0004	Strike Plate for WK Pump, PSD08	2
4100-TE-0002	3/4" Check Ball for WK Pump, PSD08, PTFE	4
4137-TE-0004	Retainer, Ball, 3/4", PTFE	4
10050-MP-0002	D-Ring	4
4135-TE-0011	PSD08TE Wear seat	2
4135-TE-0013	PSD08TE Top Manifold Wear Seat	2
4135-TE-0014	Bottom Manifold Wear Seat, PSD08TE	2
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	24
10080-TE-217	O-ring, PTFE, 217	4
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
10080-EM-113-50	#113 EPDM O-ring Seal	2
10050-UH-0004	Shaft Glide Seal for WK Pump PSD08	2

Parts included in the RBPSD08UH-OT Rebuild Kit

Part Number	Description	Quantity
5144-SS-0001	Diaphragm Shaft for WK Pump, PSD08	1
3200-TE-0001	Diaphragm for WK Pump, PSD08, PTFE	2
10010-SS-0006	Stud, Threaded	2
3300-SS-0004	Strike Plate for WK Pump, PSD08	2
4100-TE-0002	3/4" Check Ball for WK Pump, PSD08, PTFE	4
4137-UH-0001	Retainer, Ball, 3/4", UHMW	4
10050-UH-0005	D-Ring	4
4135-UH-0003	Wear Seat, PSD08UH	2
4135-UH-0005	Top Manifold Wear Seat, PSD08UH	2
4135-UH-0006	Bottom Manifold Wear Seat, PSD08UH	2
10040-PE-0009	Screw Caps for WK pumps, PSD08/16	24
10080-TE-217-55	#217 PTFE O-ring Seal	4
10300-XX-0001	PTFE Lubricant, Squeeze Tube	1
10080-EM-113-50	#113 EPDM O-ring Seal	2
10050-UH-0004	Shaft Glide Seal for WK Pump PSD08	2

4.3 Alternative Wet Kit Ordering Instructions

Listed on page 12 are the standard rebuild kits offered by White Knight. Configurable wet kits are available for purchase. To configure an alternative rebuild kit use the graphical ordering instructions shown below.

PSD Wet Side Rebuild Kit Ordering Instructions


Required Fields

RBPSD	08	TE	O	T	N
	①	②	③	④	⑤

Please select one option from each of the required fields (1 - 5). To configure your pump with options such as stroke detection, please select options from the appropriate additional options (6-8).

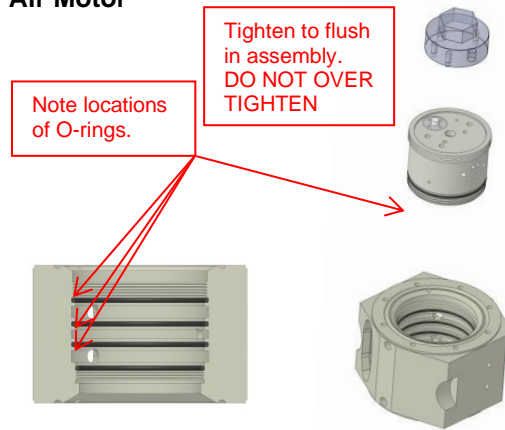
① ② ③ ④ Pump Size and Wetted Components

① Pump/orifice size		② Wetted Material*		③ Diaphragm Material		④ Check Ball Material	
04	= 1/4"	TE	PTFE	O	Over molded PTFE/EPDM	T	PTFE Ball
06	= 3/8"	UH	PE (UHMW)	E	EPDM		
08	= 1/2"			N	NBR		
16	= 1"						
24	= 1-1/2"						



* Option C is only available for 04 and 06 size pumps
 * Performance may change between ball materials

Air Motor



Air Motors do not need to be removed from the pump for service. However, complete air motors with all components (tested and certified) are available from White Knight. They can be removed and installed in the pump body as shown in the figure using the air motor pin wrench tool. (Rotate counter clockwise to remove.)

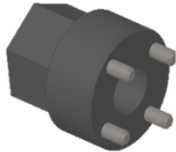
Part Number for Air Motor Assembly:

14860-NP-0001

4.4 Tools

Part Name	Part Number	QTY.
Sleeve Wrench	12100-PV-0030	1
Pin Wrench ½" and 1" Air Motor*	12100-PV-0025	1
Wearable Surface Installation Tool	12100-PV-0031	1

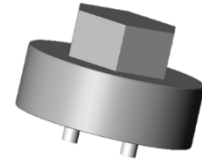
*Air motor does not need to be removed to service pump. The air motor wrench is not included with the pump but is available from White Knight.



Four pin wrench used to remove/install the Sleeve Pilot Spool Assembly (included with pump). Hex is for use with a 19mm or ¾" socket drive. (12100-PV-0030)



Tool for inserting wearable surfaces into manifolds and heads (included with pump) (12100-PV-0031)



Pin Wrench for removing air motors from ½" and 1" PSD pumps (Must purchase separately to remove air motor, not included with pump). (12100-PV-0025)

4.5 Torque Instructions

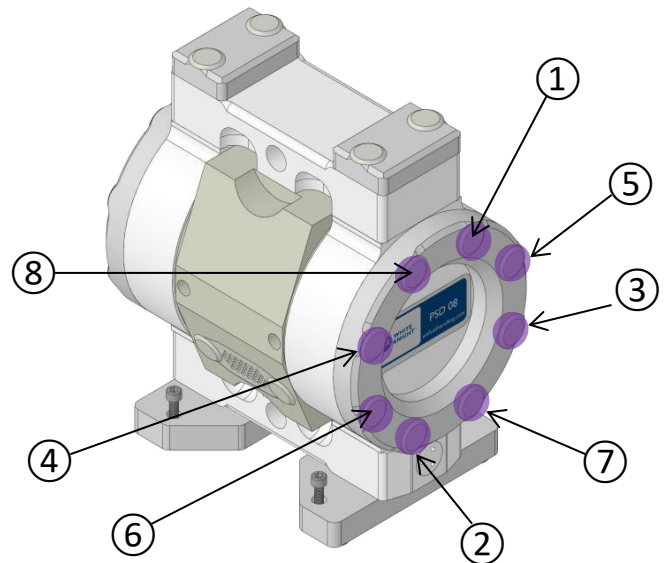
- Manifold Bolts
- Tie Bolts

Tie bolts (purple) on both sides must be torqued **before** manifold bolts (blue) on top and bottom.

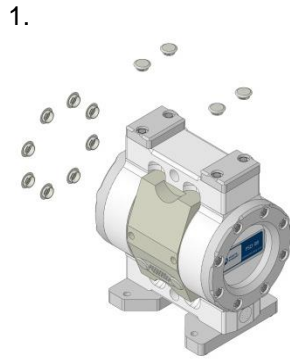
Torquing of tie bolts should be done in a crossing fashion as shown in image. There is no particular order for torquing manifold bolts other than they must be done after head bolts.

Apply Loctite Antiseize Lubricant LB 8012 (or equivalent) to all bolts. This procedure must be followed for assembly and also re-torquing of bolts.

	Rebuild Torque in-lbs. (kg-cm)	Re-torque Spec in-lbs. (kg-cm)
Tie Bolts	60 (69.1)	55 (63.4)
Manifold Bolts	40 (46.1)	35 (40.3)

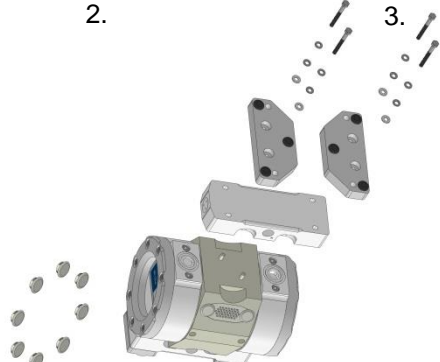


4.6 Disassembly instructions



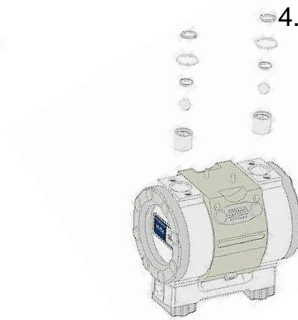
1.

- Remove all plastic caps.



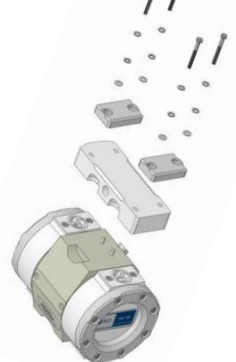
2.

- Use 10 mm socket to remove pump base feet and inlet manifold



3.

- Remove bottom O-ring, and check valve parts. Without scratching the inner bore, use a hook to remove the check cages.



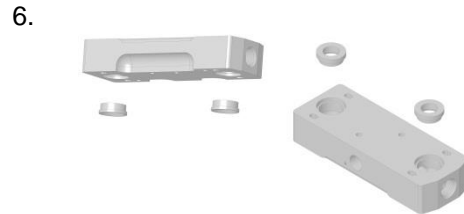
4.

- Use 10 mm socket to remove outlet manifold.



5.

- Remove top check valve parts following the same process described in step 3. Use hook to remove wearable surface placed below check assembly.



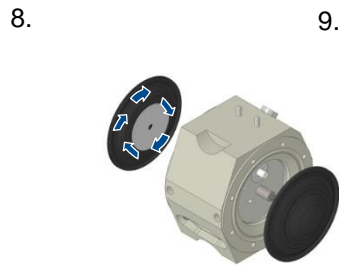
6.

- Remove wear surfaces in top and bottom manifolds. Use hook/screwdriver if necessary. **DO NOT DAMAGE MANIFOLD**



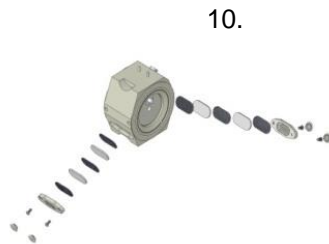
7.

- Use 10 mm socket to remove nuts from bolts on one side of head. Remove both retainer rings and heads.



8.

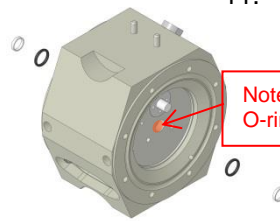
- Remove diaphragms by peeling one back and turning it counter-clockwise. Slide the second diaphragm out with the shaft.



9.

- Use 4 mm Allen wrench to remove muffer cap. Remove poly felt muffer pads and inserts.

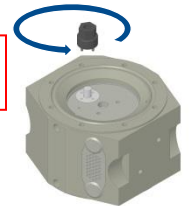
10.



- Remove the two glide seals seated in the shaft cavity. Then remove O-rings from the same slots. Take care not to damage the shaft bore or the O-ring grooves.

11.

Note locations of O-rings/seals.



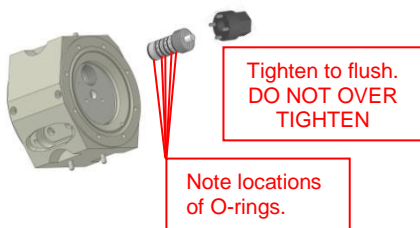
- Four pin wrench to remove pilot assembly (counter clockwise rotation). Repeat for other side.

Servicing of Pump

Before servicing the pump verify that the pump has been drained and purged so as to minimize the potential of physical damage and maximize the safety of service personnel.

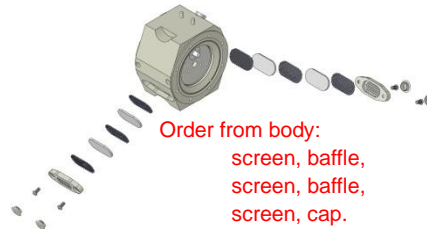
4.7 Assembly Instructions

1.



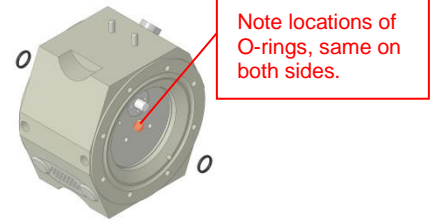
Insert pilot assembly into air motor and tighten with four pin wrench. Repeat for other side.

2.



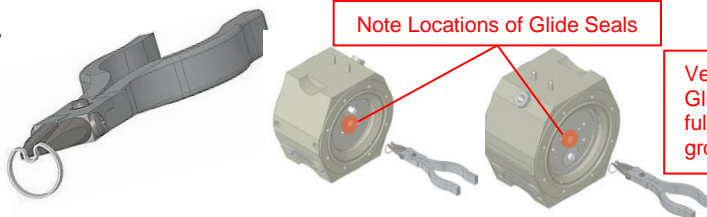
Replace inserts and porous poly baffles. Secure muffler cap with screws using 4 mm Allen Wrench. Torque to 16 in-lbs. (18 kg-cm).

3.



Taking care to not damage the shaft bore or O-ring grooves, replace the shaft O-rings.

4.



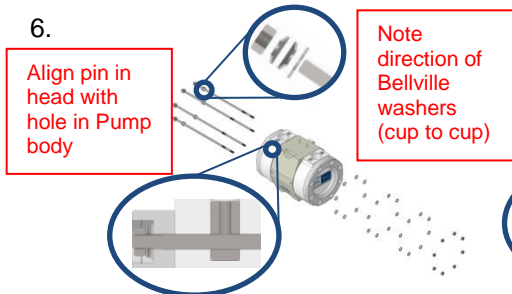
Taking care to not damage the shaft bore or O-ring grooves, replace the shaft glide seals by pinching the glide seal with needle nose pliers (rubber tipped) to form a kidney shape and insert into groove. (both sides)

5.



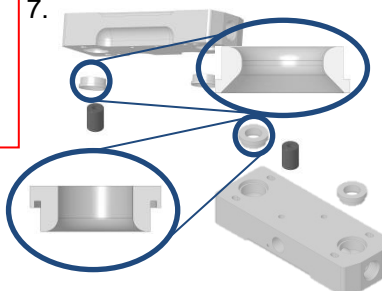
Align strike plate and thread one diaphragm to the shaft and push it through the shaft bore. Align and thread the second diaphragm and strike plate onto shaft. Make sure the diaphragms are snug on shaft.

6.



Use tie rods to attach heads and retainer rings. Install all rods but do not tighten. Verify that top and bottom rods pass through the manifold nuts placed in heads. Apply antiseize lubricant to each tie rod.

7.



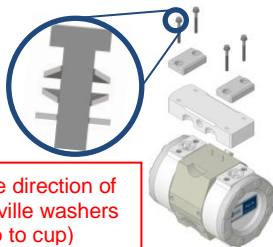
Press wear-surfaces into grooves in manifolds using PVC tool and a dead blow mallet. Note: different parts for top and bottom manifolds.

8.



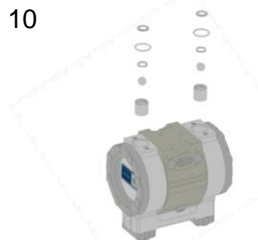
Taking care to not damage the check bore areas, replace top check valve parts, wearable surface and O-rings. NOTE ORDER OF CHECK VALVE ASSEMBLY, See Exploded View

9.



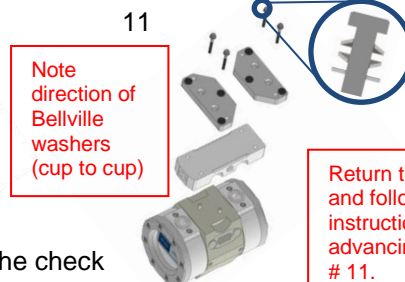
Replace outlet manifold and top retainers using 10 mm socket. Apply antiseize lubricant to each tie rod. **Do not tighten.**

10



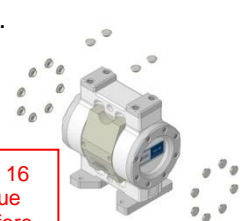
Taking care to not damage the check bore areas; replace bottom check valve parts and O-rings. NOTE ORDER OF CHECK VALVE ASSEMBLY, different from top check valves.

11



Replace inlet manifold and bottom retainers using 10 mm socket. **Do not tighten.** Return to page 16 and follow torque instructions.

12.



Replace all plastic caps.

5 Accessories

Pump Service Pin Wrench- 12100-PV-0030

PSD08 Wearable Surface Installation Tool- 12100-PV-0031

Air Motor Pin Wrench- 12100-PV-0025

Remote Muffler Adaptor Kit- (Not included with pump.) Required if pump is to be submerged.

Pump Catcher™

- Inline options available.
- Large through holes to avoid loading.
- Filter may be removed without removing the **Catcher™** from the pump or the line.
- If a pump were damaged by passing solids while using the **Catcher™** it would be repaired under warranty.

Control & Monitoring Options

Stroke Detection

- Solid State Pressure Switch SP1

Leak Detection

- Conductivity Leak Detection LC0

Control Options – Run mode and flow rate are a few of the items which the **CPT-1** can control/monitor.

6 Warranty

White Knight Fluid Handling follows strict procedures in all phases of manufacturing, assembly, and testing to ensure reliability of its products. Each pump is individually tested to assure its functional operation integrity.

White Knight Fluid Handling warrants the PSD08 pump, subassemblies and components to be free from defects in materials and workmanship to one year from date of start-up or 18 months from the date of shipment whichever applies. Failures due to misuse, abuse or any unauthorized disassembly of a White Knight[®] pump will nullify this warranty.

The PSD08 pump is warranted for up to 100 PSI air supply pressures. It is not covered under dry run condition. Wearable parts are not covered.

Due to the broad and ever-evolving applications for usage of White Knight[®] pumps we cannot guarantee the suitability of any pump component or subassembly for any particular or specific application. White Knight Fluid Handling shall not be liable for any consequential damage or expense arising from the use or misuse of its products in any application. Responsibility is limited solely to the replacement or repair of defective White Knight[®] pumps, components or subassemblies. All options to rebuild or replace aforementioned items shall remain under the judgment of White Knight Fluid Handling. Decisions as to the cause of failure shall be solely determined by White Knight Fluid Handling.

Prior written, faxed or emailed approval must be obtained from White Knight Fluid Handling before returning any pump component or subassembly for warranty consideration.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY WARRANTIES OF SUITABILITY FOR ANY PARTICULAR PURPOSE. NO VARIATIONS OF THIS WARRANTY BY ANYONE OTHER THAN THE PRESIDENT OF WHITE KNIGHT FLUID HANDLING IN A SELF-SIGNED AGREEMENT SHALL BE HONORED OR CONSIDERED LEGALLY BINDING.

Brian Callahan
President
White Knight Fluid Handling

7 Certificate & Declaration of Conformity



CERTIFICATE & DECLARATION OF CONFORMITY FOR CE MARKING

Company contact details:

White Knight Fluid Handling Inc.
187 E. 670 S., Kamas, Utah, 84036, USA

White Knight Fluid Handling Inc. declares that their:

Bellows Pump Line

PSA030, PSA060, PSA140, PSH030, PSH060, PSH140, PSU030, PSU060, PSU140, PSA025, PSA050, PFA030, PFA060, PFA140, PFH030, PFH060, PFH140, PFU030, PFU060, PFU140, PXA030, PXA060, PXA140, PXH030, PXH060, PXH140, PXU030, PXU060, PXU140

Diaphragm Pump Line (Non Conductive)

PSD04TE, PSD06TE, PSD08TE, PSD16TE, PSD24TE, PSD04UH, PSD06UH, PSD08UH, PSD16UH, PSD24UH

Diaphragm Pump Line (Conductive)

PSD04TC, PSD06TC, PSD08TC, PSD16TC, PSD24TC, PSD04UC, PSD06UC, PSD08UC, PSD16UC, PSD24UC

Legacy Pump Line

PLS30, PLS60, PLS120, PLX30, PLX60, PLX120, PX30, PX60, PX120, PLF30, PLF60, PLF120

Metering Pumps

PPM100, PEM100, PEM050

Plastic Pumps

PHC40-2, PPMC300

are classified within the following EU Directives as applicable:

Machinery Directive 2006/42/EC
Low Voltage Directive 2014/35/EU
Electromagnetic Compatibility Directive 2014/30/EU
RoHS 2 Directive 2011/65/EU

and further conform with the following EU Harmonized Standards as applicable:

EN 809:1998+A1:2009 EN 60204-1:2006 + A1:2009 EN 61000-6-2:2005 EN 61000-6-4:2007+A1:2011

Dated: 16 January 2017

Position of signatory: Product Manager **Name of Signatory:** Cory Ammon Simmons

Signed below: on behalf of White Knight Fluid Handling Inc.



White Knight Support

187 E. 670 S.
Kamas, UT 84036
Phone: 435.783.6040
Toll Free: 888.796.2476
Fax: 435.783.6128

support@wkfluidhandling.com

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