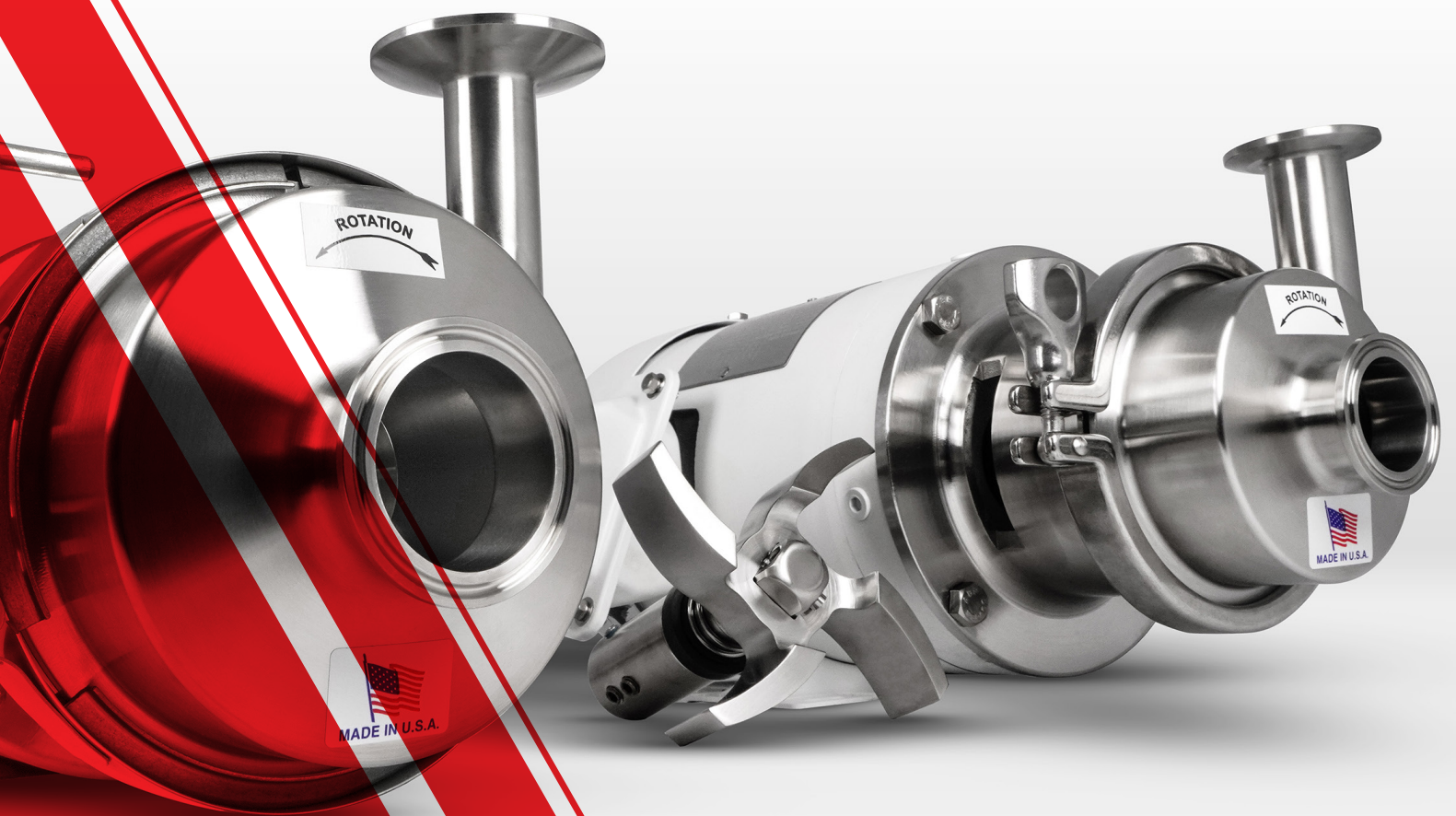


PUMPS SP41/SP51/SP61/SP81



INSTALLATION
OPERATION
MAINTENANCE

SPI 
STAINLESS-PRODUCTS.COM

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\\INTRODUCTION

ABOUT

Thank you for purchasing a pump from Stainless Products, LLC (SPI).

This manual contains installation, operation, and maintenance instructions for the SP41, SP51, SP61, and SP81 pumps.

SPI pumps are designed for minimal routine maintenance, but care and attention should be given to the instructions provided in this manual.

Do not remove any labeling on any SPI product. Immediately replace any label that is missing.

If, at any point, you have questions or concerns regarding your SPI pumps, please call 1-800-558-9446 or 262-859-2826.

\\SAFETY

IMPORTANT SAFETY INFORMATION

Read this manual before installing, operating, and maintaining this equipment. Failure to read the manual can result in personal injury and/or equipment damage.

Do not attempt to remove and/or modify any SPI product. Doing so can create unsafe conditions for the operator(s) and/or surrounding persons . Any change to SPI products will void any and all warranties.

Do not place any SPI product in an application where general product service ratings are exceeded. Doing so puts the operator(s) and/or surrounding persons at risk of personal injury and/or result in equipment damage.

Do not remove any labeling on any SPI product. Immediately replace any label that is missing.

DISCLAIMER OF LIABILITY

SPI does not assume responsibility and expressly disclaims liability for loss, damage, or expenses that arise in any way from the installation, operation, use, or maintenance performed in accordance with this manual. SPI assumes no responsibility for any infringement of patents or other rights of third parties that may result from use of the module . No license is granted by implication or otherwise under any patent or patent rights.

SPI reserves the right to make changes to the product, specifications, or this manual without prior notice.

\\TECHNICAL DATA

MATERIALS OF CONSTRUCTION

- Pump Head: 316L Stainless Steel
- Impeller: 316L Stainless Steel or CF8M (316) Stainless Steel
- Backplate: 316L Stainless Steel
- Impeller Nut – SP41: 316L Stainless Steel
- Impeller Pin – SP51/SP61/SP81: 316L Stainless Steel
- Spring: T302 Stainless Steel
- Impeller Shaft: 316L Stainless Steel
- Adapter: 304 Stainless Steel
- Optional Leg Kit: 304 Stainless Steel

SEAL TYPES

- Single mechanical with:
 - Resin impregnated carbon rotary seal
 - PTFE rotary seal (optional)
 - Ceramic stationary seal

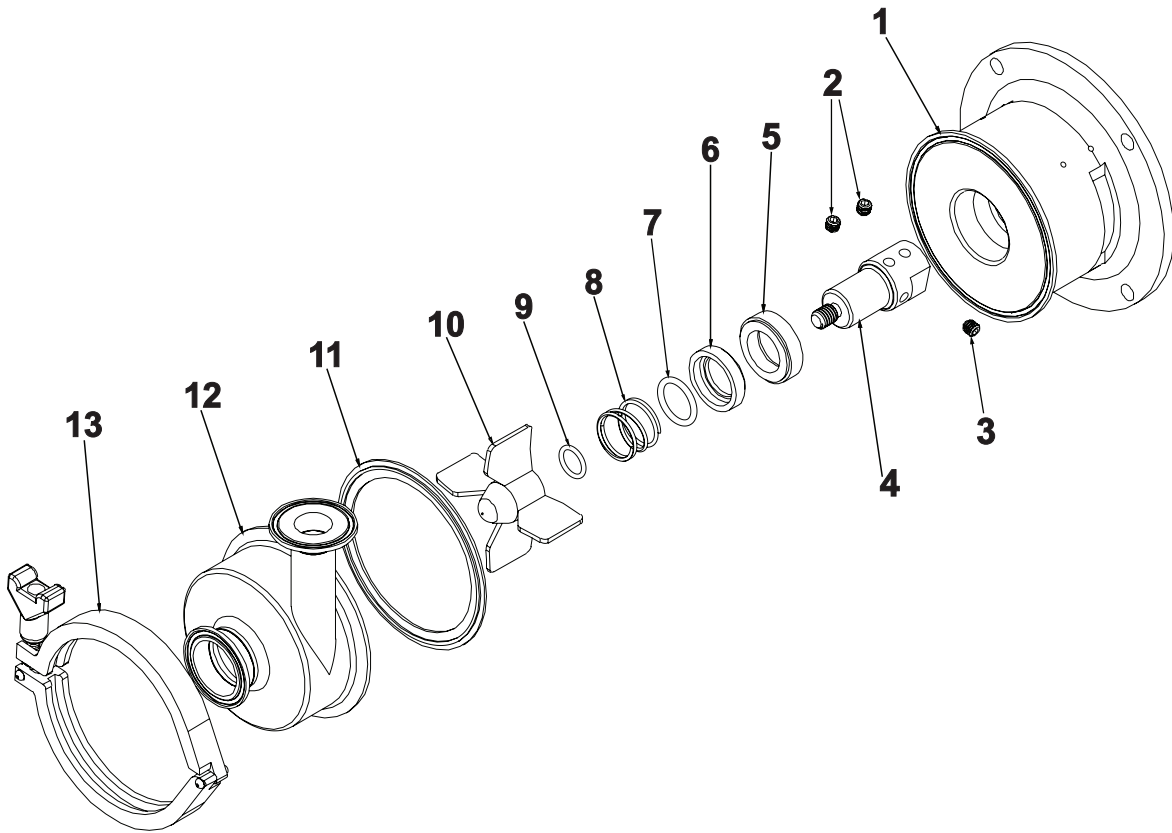
SURFACE FINISH

- 32Ra or less on product contact surfaces

APPROVALS

- 3-A per 02-12
- Materials FDA approved

\\SPARE PARTS - SP41

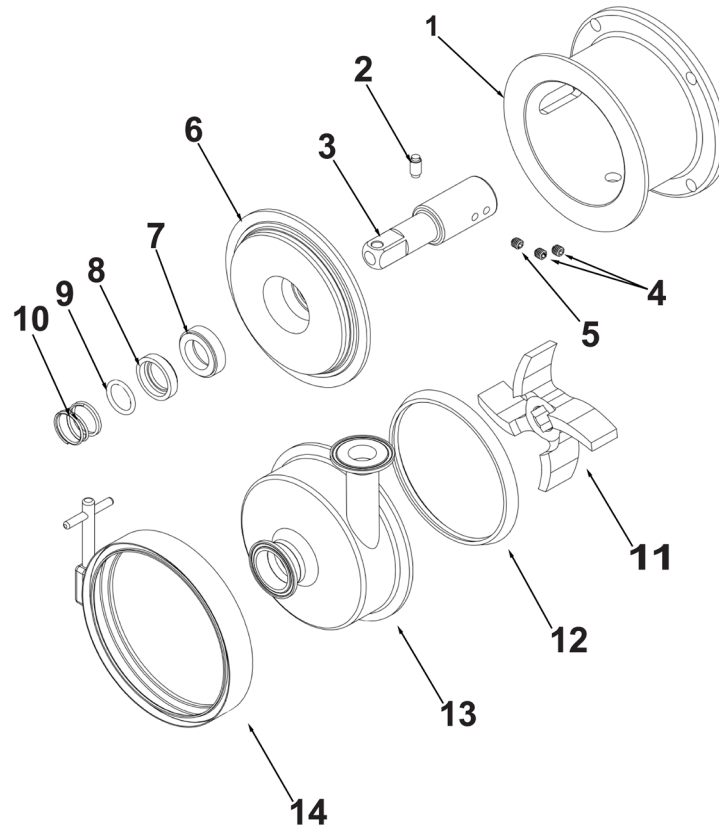


SP41 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP41-19-56	Pump Adapter	1	
2	10B-1.5-HSP-NP	Set Screw	2	
3	SP6-41-SSFDP	Set Screw	1	
4	SP6-41-56	Impeller Shaft	1	
5	SP51-80C	Ceramic Stationary Seal	1	▲
6	SP51-80T	Rotary Seal PTFE	1	▲
	SP51-80TC	Rotary Seal Carbon		
7	SP51-80N	Seal O-Ring	1	▲
8	SP41-80S	Spring	1	▲
9	SP41-40	Impeller O-Ring	1	▲
10	SP41-2-Size	Impeller	1	
11	SP40-4	Backplate Gasket	1	
12	SP41-1	Pump Head	1	
13	SP13HC-4	Pump Head Clamp	1	

▲ Included in SP41-SK Seal Kit

2" Inlet x 2" Outlet available upon request

\\SPARE PARTS - SP51

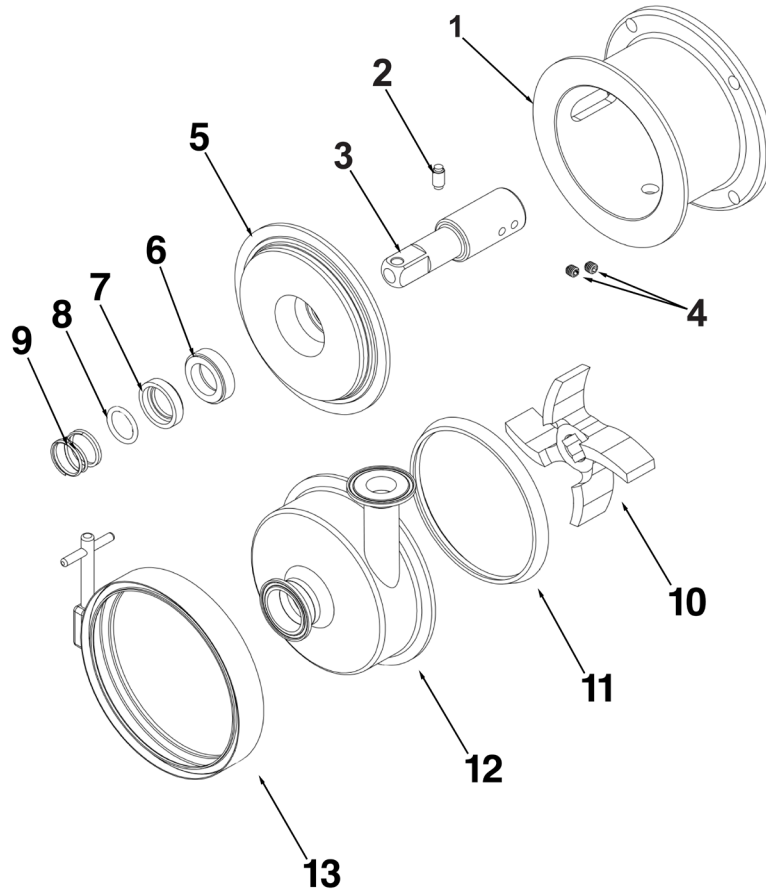


SP51 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP51-19-56	Pump Adapter	1	
2	SP26-51	Retaining Pin	1	
3	SP6-51-56 SP6-51-145	Impeller Shaft	1	
4	SP6-41-SSFDP	Set Screw (for -56 Shaft only)	2	
5	10B-1.5-HSP-NP	Set Screw (for -56 Shaft)	1	
		Set Screw (for -145 Shaft)	2	
6	SP51-11	Backplate	1	
7	SP51-80C	Ceramic Stationary Seal	1	▲
8	SP51-80T	Rotary Seal PTFE	1	▲
	SP51-80TC	Rotary Seal Carbon		
9	SP51-80N	Seal O-Ring	1	▲
10	SP51-80S	Spring	1	▲
11	SP51-2-Size	Impeller	1	
12	SP40-215	Backplate Gasket	1	
13	SP51-1	Pump Head	1	
14	SP51-13HC	Pump Head Clamp	1	

▲ Included in SP51-SK Seal Kit

2" Inlet x 2" Outlet available upon request

\\SPARE PARTS - SP61

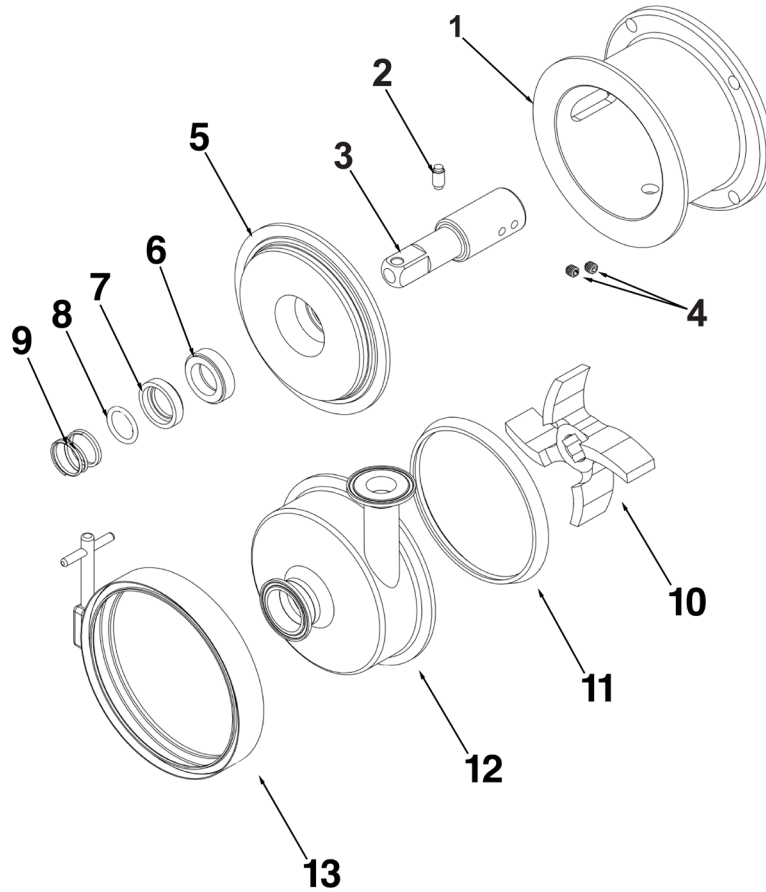


SP61 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP61-19-56 SP61-19-184	Pump Adapter	1	
2	SP26-51	Retaining Pin	1	
3	SP6-61-184 SP6-61-215 SP6-61-256	Impeller Shaft	1	
4	10B-1.5-HSP-NP	Set Screw	2	
5	SP61-11	Backplate	1	
6	SP51-80C	Ceramic Stationary Seal	1	▲
7	SP51-80T SP51-80TC	Rotary Seal PTFE Rotary Seal Ceramic	1	▲
8	SP51-80N	Seal O-Ring	1	▲
9	SP51-80S	Spring	1	▲
10	SP61-2-Size	Impeller	1	
11	SP40-216	Backplate Gasket	1	
12	SP61-1	Pump Head	1	
13	SP61-13HC	Pump Head Clamp	1	

▲ Included in SP61-SK Seal Kit

2" Inlet x 2" Outlet available upon request

\\SPARE PARTS - SP81

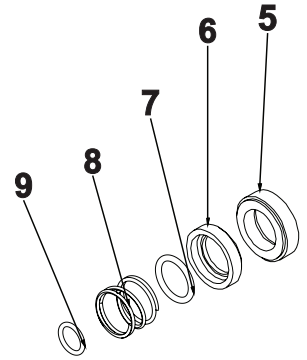


SP81 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP81-19-184	Pump Adapter	1	
2	SP26-81	Retaining Pin	1	
3	SP6-81-184 SP6-81-215 SP6-61-256	Impeller Shaft	1	
4	10B-1.5-HSP-NP	Set Screw	2	
5	SP81-11	Backplate	1	
6	SP81-80C	Ceramic Stationary Seal	1	▲
7	SP81-80T SP81-80TC	Rotary Seal PTFE Rotary Seal Carbon	1	▲
8	SP81-80N	Seal O-Ring	1	▲
9	SP81-80S	Spring	1	▲
10	SP81-2-Size	Impeller	1	
11	SP40-218	Backplate Gasket	1	
12	SP81-1	Pump Head	1	
13	SP81-13HC	Pump Head Clamp	1	

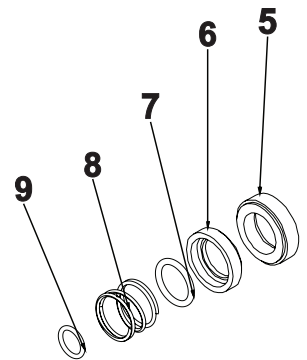
▲ Included in SP81-SK Seal Kit

\\SEAL KITS

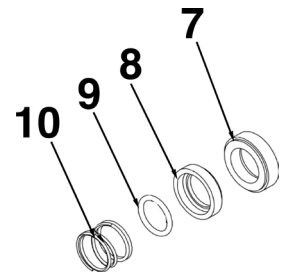
SP41 Seal Kit SP41-SK-C			
Item #	Part Number	Description	Qty
5	SP51-80C	Ceramic Stationery Seal	1
6	SP51-80C	Rotary Seal - Carbon	1
7	SP51-80N	Seal O-Ring	1
8	SP41-80S	Spring	1
9	SP41-40	Impeller O-Ring	1



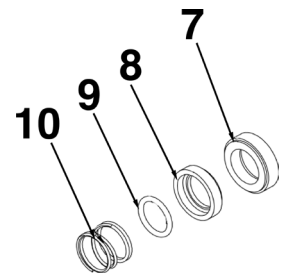
SP41 Seal Kit SP41-SK-T			
Item #	Part Number	Description	Qty
5	SP51-80C	Ceramic Stationery Seal	1
6	SP51-80T	Rotary Seal - PTFE	1
7	SP51-80N	Seal O-Ring	1
8	SP41-80S	Spring	1
9	SP41-40	Impeller O-Ring	1



SP51 Seal Kit SP51-SK-C			
Item #	Part Number	Description	Qty
7	SP51-80C	Ceramic Stationery Seal	1
8	SP51-80C	Rotary Seal - Carbon	1
9	SP51-80N	Seal O-Ring	1
10	SP51-80S	Spring	1

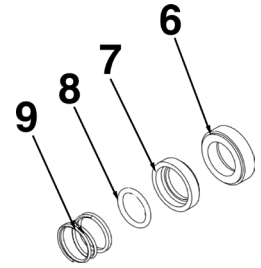


SP51 Seal Kit SP51-SK-T			
Item #	Part Number	Description	Qty
7	SP51-80C	Ceramic Stationery Seal	1
8	SP51-80T	Rotary Seal - PTFE	1
9	SP51-80N	Seal O-Ring	1
10	SP51-80S	Spring	1

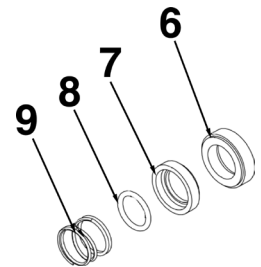


\\SEAL KITS

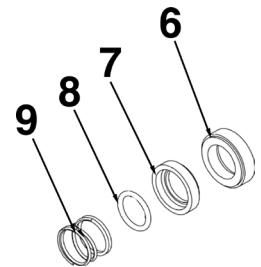
SP61 Seal Kit SP61-SK-C			
Item #	Part Number	Description	Qty
6	SP51-80C	Ceramic Stationery Seal	1
7	SP51-80C	Rotary Seal - Carbon	1
8	SP51-80N	Seal O-Ring	1
9	SP41-80S	Spring	1



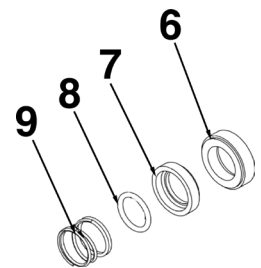
SP61 Seal Kit SP61-SK-T			
Item #	Part Number	Description	Qty
6	SP51-80C	Ceramic Stationery Seal	1
7	SP51-80T	Rotary Seal - PTFE	1
8	SP51-80N	Seal O-Ring	1
9	SP41-80S	Spring	1



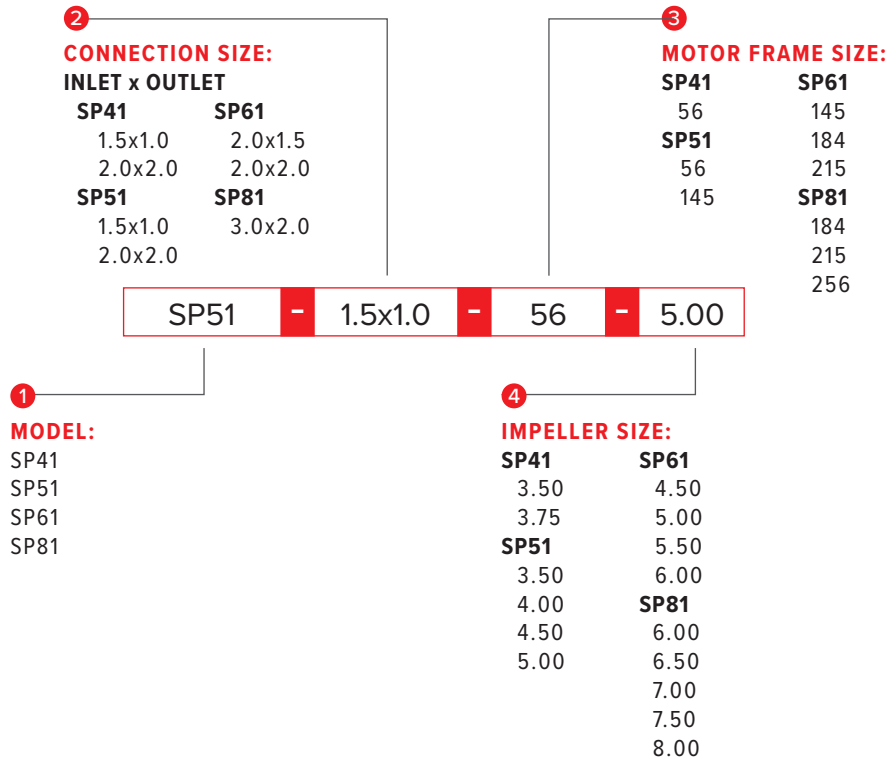
SP81 Seal Kit SP81-SK-C			
Item #	Part Number	Description	Qty
6	SP81-80C	Ceramic Stationery Seal	1
7	SP81-80C	Rotary Seal - Carbon	1
8	SP81-80N	Seal O-Ring	1
9	SP81-80S	Spring	1



SP81 Seal Kit SP81-SK-T			
Item #	Part Number	Description	Qty
6	SP81-80C	Ceramic Stationery Seal	1
7	SP81-80T	Rotary Seal - PTFE	1
8	SP81-80N	Seal O-Ring	1
9	SP81-80S	Spring	1



\\PART NUMBER CONFIGURATOR



\\ASSEMBLY INSTRUCTIONS - SP41

1. Clean and degrease the motor shaft. Apply a small amount of food-grade anti-seize to the motor shaft and keyway. The key is not required on the SP41 because it uses the 56C shaft shown in **Figure 1**.
2. Apply the impeller shaft (4) onto the motor shaft and lightly snug only the set screw shown in **Figure 3** using a 5/32" hex wrench. The impeller shaft will need to be adjusted later for impeller clearance.
 - A. The 56C frame size impeller shaft has three set screws
 - The 56C impeller shaft uses two special set screws (2) shown in **Figure 2** with smaller diameters to tighten against the flat in the motor's keyway. The key provided with the motor is not required in this assembly. Tighten the two set screws onto the motor keyway using a 5/32" hex wrench and then tighten the third set screw (3) onto the motor shaft.

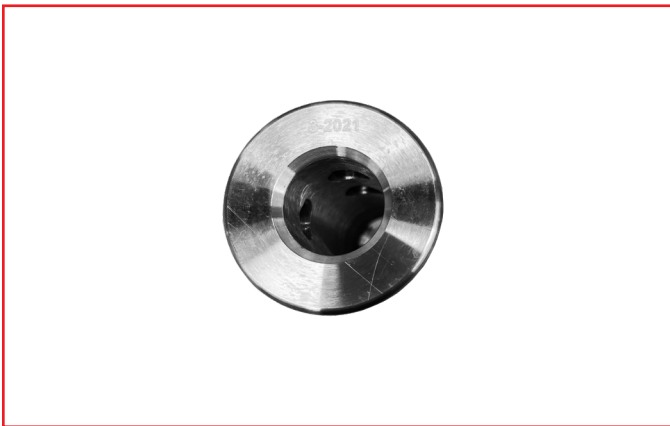


FIG. 1 - SP41 IMPELLER SHAFT – MOTOR SIDE FOR 56C



FIG. 2 - 56C IMPELLER SHAFT SET SCREW FOR KEYWAY



FIG. 3 - SP41 IMPELLER SHAFT SET SCREWS – ONLY SNUG BOTTOM SCREW IN THIS STEP

ASSEMBLY INSTRUCTIONS – SP41

3. Temporarily assemble the pump adapter (1) onto the motor c-face using the four hex-head cap screws provided. Lightly snug the screws as the adapter will need to be removed later for access to the impeller shaft (4) screws. The adapter has two slots and one drain hole (shown in **Figure 4 and 5**). It is oriented as follows:

- The slots will be on either side but should be oriented horizontally at the 3 or 9 o' clock positions.
- The drain hole must point down to allow for proper drainage.

NOTE: If there is not access to the set screw from step 2 through the adapter slot; re-position the impeller shaft (4) until access is possible.



FIG. 4 - ADAPTER SLOTS



FIG. 5 - ADAPTER DRAIN HOLE

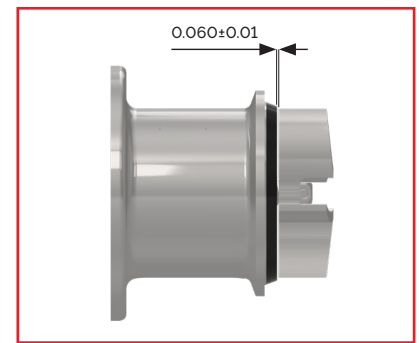


FIG. 6 - IMPELLER CLEARANCE MEASUREMENT

4. Temporarily assemble the impeller (10) onto the impeller shaft (4). Use food grade anti-seize on the impeller shaft threads and tighten the impeller by hand, only. It is right hand thread.
5. Set the impeller (10) clearance from the adapter (2) – **specification is 0.06" +/- 0.01" clearance.** (See **Figure 6**.)
- A. Loosen the set screw on the impeller shaft (4) using a 5/32" hex wrench by gaining access through the slots in the adapter.
 - B. Using a feeler gauge between the impeller (10) and adapter (1), push the impeller onto the gauge and tighten the set screw on the impeller shaft from step 2.
 - Check all impeller blades. If any of them exhibit clearances under the low-end of the clearance tolerance, repeat steps 5A and 5B until the minimum clearance is met on all impeller blades.

\\ASSEMBLY INSTRUCTIONS - SP41

6. Remove the impeller from the impeller shaft. Remove the adapter from the motor. Fully tighten all three set screws on the impeller shaft and torque to 131 in-lbs. Now the impeller shaft is set in its place and final assembly can take place.
7. Prepare the adapter for final assembly:
 - A. Locate the backplate/pump head gasket (11)
 - B. Install the stationary seal element (5) into the backplate/adapter.
 - Use temporary food-grade lubricant on the outer diameter of the elastomer “cup”.
 - Do not get dirt, grease, or other contaminants on the seal face which is the smooth side of the stationary seal and faces away from the motor-side of the pump. Refrain from using hard tools.



FIG. 7 - ADAPTER/BACKPLATE SUB-ASSEMBLY COMPONENTS



FIG. 8 - ADAPTER/BACKPLATE SUB-ASSEMBLY COMPLETED

ASSEMBLY INSTRUCTIONS – SP41

8. Prepare the rotary seal/impeller for final assembly:

- A. Locate the rotary seal (6), seal o-ring (7), spring (8) and impeller o-ring (9).
- B. Install the rotary seal element onto the impeller shaft.
 - The rotary seal (6) comes in two materials: carbon or PTFE.
 - Install the rotary seal (6) onto the impeller shaft (4) with the smooth side facing the stationary seal (5).
 - Install the rotary seal o-ring (7). Use temporary food-grade lubricant and press the o-ring into the rotary seal until it's seated down evenly.



FIG. 9 - CARBON ROTARY SEAL

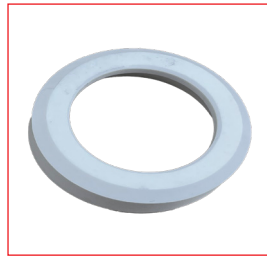


FIG. 10 - PTFE ROTARY SEAL

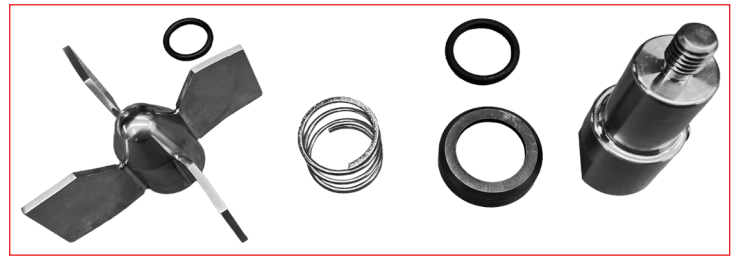


FIG. 11 - ROTARY SEAL COMPONENTS



FIG. 12 - SIDE VIEW OF ROTARY SEAL ON IMPELLER



FIG. 13 - SP51 SPRING WITH COUNTER-CLOCKWISE COIL DIRECTION (LEFT) AND SP41 SPRING WITH CLOCKWISE COIL DIRECTION (RIGHT)

9. Install the spring and impeller:

- A. Ensure the spring is the correct coil direction. **Figure 13** shows SP41 spring direction.
- B. Install the spring onto the impeller shaft/rotary seal as shown in **Figure 12**.
- C. Install the impeller o-ring into the groove on the impeller.
- D. Install the impeller. Screw the impeller onto the impeller shaft until it bottoms out. Using a 1" wrench through the slot in the adapter (**Figure 4**) hold the impeller shaft and snug the impeller by hand.

\\ASSEMBLY INSTRUCTIONS - SP41

10. Install the pump head (12) (sometimes called pump casing):

A. Prepare the pump head clamp (13).

- Apply food grade anti-seize to the threads on the hand nut.
- Adjust the hand nut open so the threaded rod can swing through the receiving side of the clamp.

B. Install the pump head gasket (11).

C. Present the pump head (12) to the backplate/adapter (1) using a laser or bubble level on the discharge port to ensure orientation is correct.

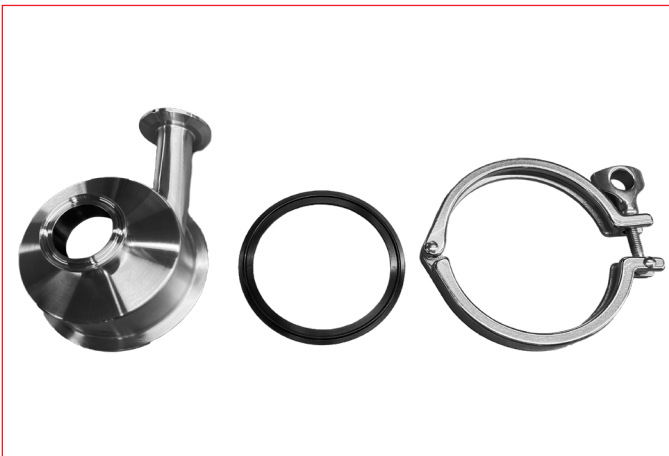


FIG. 14 - PUMP HEAD, CLAMP, GASKET



FIG. 15 - PUMP HEAD WITH GASKET INSTALLED

\\ASSEMBLY INSTRUCTIONS - SP41

D. Install the pump head clamp (13).

- Hinge open the pump head clamp enough to fit around the joint.
- Swing the hand nut and threaded rod into the opposing side of the clamp (**Figure 16**).
- Tighten the tee nut by hand until hand tight with moderate force.



FIG. 16 - PUMP HEAD CLAMP DETAIL

\\CLEANING PROCEDURES - CLEAN IN PLACE AND MANUAL

Background: SP41, SP51, SP61 and SP81 pumps are able to be cleaned via clean-in-place (CIP) methods. The centrifugal pump may be used as the motive force during CIP or may be “cleaned-through” by another pump upstream of this centrifugal pump. Internal geometries, design, materials of construction and surface finish are all causes for SPI pumps to be able to be CIP’d.

1. Extra care should be taken to inspect surface finish after use and routinely of all product-contact parts
2. Seals should be inspected for leaking, cracks, heat-damage, and other imperfections from use. They should be replaced annually and inspected regularly per the users’ maintenance schedule or when leaking, irregular noises, or other reasons to suspect problems arise.
3. The SP51, SP61 and SP81 pumps have the square-hole impeller, and centrifugally activated pin design. While this design is CIP-able and meets 3-A standards; surface finish on all parts need to remain under 32Ra surface roughness to demote the growth of biofilms. This surface finish suggestion is generally true of all product-contact parts.
4. SP41 pumps have a thread-on impeller and static impeller gasket. Risks of normal use causing surface roughness issues are much less likely with this design, however the threads in the impeller and impeller shaft need to be manually cleaned during maintenance intervals.

A. Manual cleaning per 3-A general spec T-00-00 is defined:

C3.3 Manual Cleaning: Removal of soil when the equipment is partially or totally disassembled. Soil removal is effected with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, and high or low pressure hoses, with cleaning aids manipulated by hand.

B. Therefore, a typical procedure for the SP41 pump’s threaded areas should be performed as such:

- i. Remove the impeller
- ii. Inspect the impeller and its o-ring. In rare cases, it may have some biomass on the o-ring, impeller, o-ring groove and female threads. See figure A1 for example.
- iii. The impeller shaft may remain on the motor shaft. Its male threads may exhibit the same biomass. See figure A2 for example.



FIG. A1



FIG. A2

\\CLEANING PROCEDURES - CLEAN IN PLACE AND MANUAL

iv. Use a hot caustic agent, scrubbing agents' sanitation procedure) and a brush small enough to access the pitch of the external threads and entire cavity with internal threads on the impeller nut. Scrub the internal and external threads as shown in figure A3 until visibly clean. See figure A4 for example.



FIG. A3

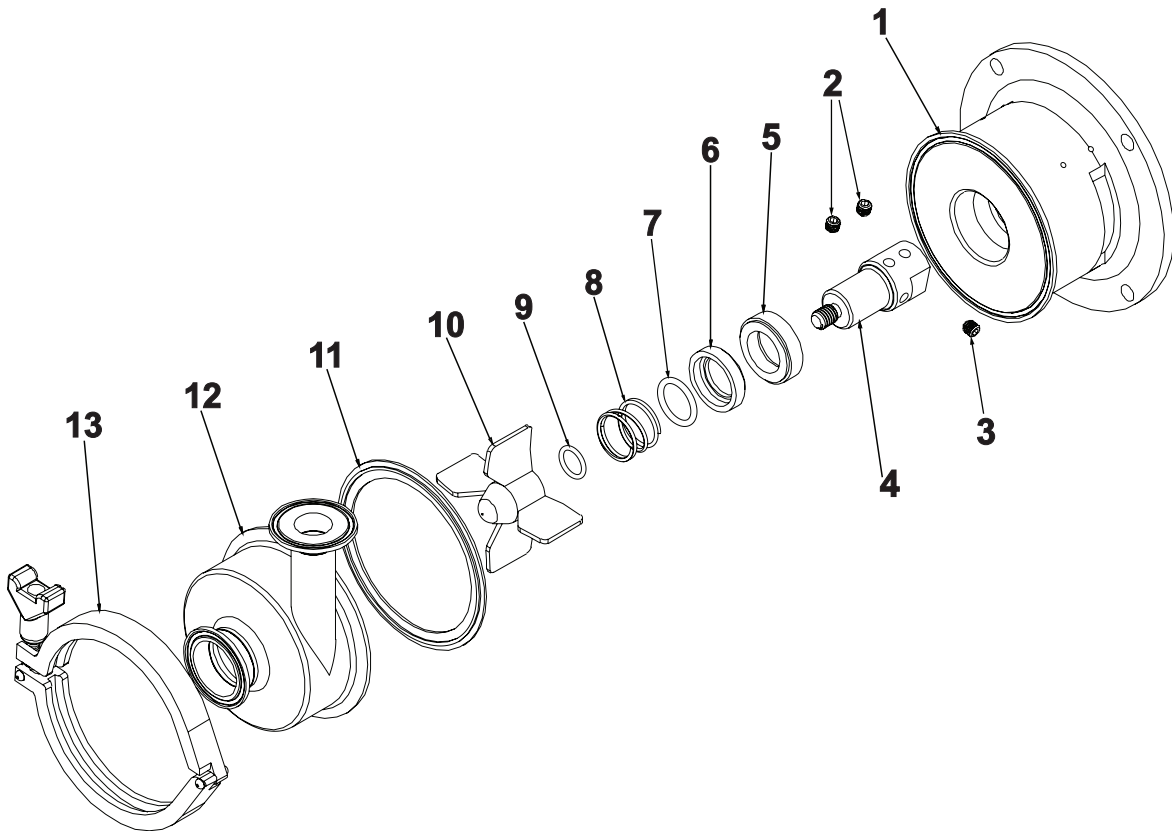


FIG. A4

- v. Inspect all parts for damage, cleanliness and fitment
- vi. Soak the impeller nut gasket in the chemical solution.
- vii. Rinse the parts exposed to chemical with water until they are visibly rinsed and neutralized.
- viii. Use sanitizer, such as diluted Paracetic acid or similar and repeat steps on all parts washed with caustic agent, scrubbing agent, detergent or similar.
- ix. Optional: swab test an internal surface which will not be cleaned during CIP and test for the presence of ATP. Ensure the counts are low enough per the users' sanitation procedures/specifications. If they are not, repeat all steps in this procedure.

EXPLODED DIAGRAM- SP41

IN ASSEMBLY ORDER



SP41 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP41-19-56	Pump Adapter	1	
2	10B-1.5-HSP-NP	Set Screw	2	
3	SP6-41-SSFDP	Set Screw	1	
4	SP6-41-56	Impeller Shaft	1	
5	SP51-80C	Ceramic Stationary Seal	1	▲
6	SP51-80T SP51-80TC	Rotary Seal PTFE Rotary Seal Carbon	1	▲
7	SP51-80N	Seal O-Ring	1	▲
8	SP41-80S	Spring	1	▲
9	SP41-40	Impeller O-Ring	1	▲
10	SP41-2-Size	Impeller	1	
11	SP40-4	Backplate Gasket	1	
12	SP41-1	Pump Head	1	
13	SP13HC-4	Pump Head Clamp	1	

▲ Included in SP41-SK Seal Kit

2" Inlet x 2" Outlet available upon request

\\ASSEMBLY INSTRUCTIONS – SP51/SP61/SP81

1. Clean and degrease the motor shaft. Apply a small amount of food-grade anti-seize to the motor shaft and keyway.
2. Apply the impeller shaft (3) onto the motor shaft and lightly snug the set screws using a 5/32" hex wrench. The impeller shaft will need to be adjusted later for impeller clearance toward the final steps of assembly.
 - A. The 56C frame size impeller shaft has three set screws and the 145TC/184TC/215TC/256TC has two set screws and a keyway – differences shown in **Figure 18**.
 - The 56C impeller shaft uses two special set screws (4) shown in figure 2 with smaller diameters to tighten against the flat in the motor's keyway. The key provided with the motor is not required in this assembly. Tighten the two set screws onto the motor keyway using a 5/32" hex wrench and then tighten the third set screw (5) onto the motor shaft.
 - The 145TC/184TC/215TC/256TC impeller shaft uses two set screws. Use the key supplied with the motor and tighten the set screw onto the motor key using a 5/32" hex wrench. Then tighten the second set screw (5) onto the motor shaft. Refer to torque specs in **Table 1**.



FIG. 18 - SP51 IMPELLER SHAFTS – MOTOR SIDE FOR 56C (LEFT) AND 145TC (RIGHT)

MOTOR FRAME	TORQUE ON SET SCREWS (IN-LBS)
56C	131
145TC	131
184TC	131
215TC	131
256TC	131

TABLE 1 - SET SCREW TORQUE SPECS



FIG. 19 - 56C IMPELLER SHAFT SET SCREW FOR KEYWAY

\\ASSEMBLY INSTRUCTIONS - SP51/SP61/SP81

3. Assemble the pump adapter (2) onto the motor c-face using the four hex-head cap screws provided.
- A. The adapter has one slot and two drain holes (shown in **Figure 20**). It is oriented as follows:
- The slot can be on either side but should be oriented horizontally at the 3 or 9 o'clock positions.
 - There are two drain holes so that the bottom one can be used for drainage under either orientation.



FIG. 20 - ADAPTER SLOT AND DRAIN HOLES

MOTOR FRAME	TORQUE ON SET SCREWS (FT-LBS)
56C	19.4
145TC	19.4
184TC	47
215TC	47
256TC	47

TABLE 2 - ADAPTER SCREW TORQUE SPECS

\\ASSEMBLY INSTRUCTIONS – SP51/SP61/SP81

4. Prepare the backplate (6) for assembly onto the adapter.
 - A. Install the backplate gasket (12) onto the backplate.
 - B. Install the stationary seal element (7) into the backplate.
 - Use temporary food-grade lubricant on the outer diameter of the elastomer “cup”.
 - Do not get dirt, grease, or other contaminants on the seal face which is the smooth side of the stationary seal and faces away from the motor-side of the pump. Refrain from using hard tools.
 - Refer to **Figure 21-22** for the backplate (6), backplate gasket (12) and stationary seal (7) before and after sub-assembly.
5. Install the backplate (6) into the adapter (2). If the impeller shaft impedes the backplate, loosen the set screws and push the impeller shaft back further onto the motor and tighten the set screws again.

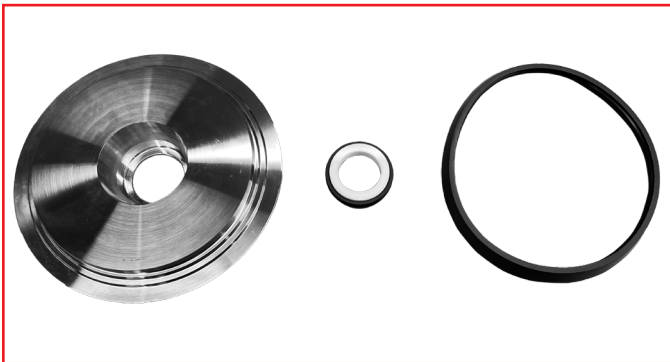


FIG. 21 - BACKPLATE, STATIONARY SEAL, BACKPLATE GASKET

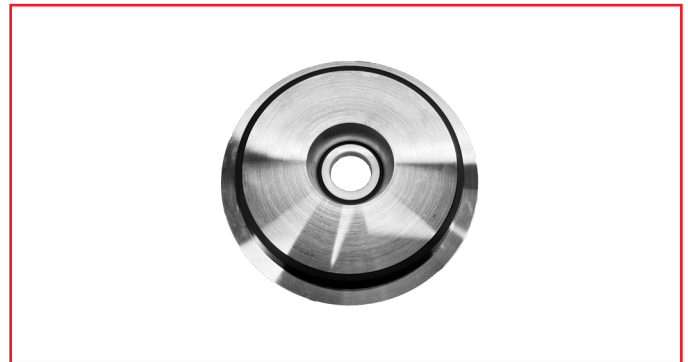


FIG. 22 - BACKPLATE SUB-ASSEMBLY FINISHED

\\ASSEMBLY INSTRUCTIONS - SP51/SP61/SP81

5. Assemble the rotary seal (8) onto the impeller shaft (3).

A. The rotating seal sub-assembly consists of the rotary seal element (8), seal o-ring (9) and spring (10).

- The rotary seal (8) comes in two materials: carbon or PTFE. (See **Figures 23-24.**)
- Install the rotary seal (8) onto the impeller shaft (3) with the smooth side facing the stationary seal (7).
- Install the rotary seal o-ring (9). Use temporary food-grade lubricant and press the o-ring into the rotary seal until it's seated down evenly.



FIG. 23 - CARBON ROTARY SEAL



FIG. 24 - PTFE ROTARY SEAL



FIG. 25 - ALL COMPONENTS TO BE ASSEMBLED ON IMPELLER SHAFT

\\ASSEMBLY INSTRUCTIONS – SP51/SP61/SP81

6. Assemble the impeller (11) onto the impeller shaft (3) – **Figure 26** shows a side view for reference.
- A. For this step the impeller retaining pin (2), the spring (10) and impeller (11) are required.
- Install the spring (10) so that one flat end is touching the seal o-ring (9).
 - Install the impeller retaining pin (2) so that it is fully flush with both sides of the square impeller shaft. See **Figure 27** for details.
 - Install the impeller (11) compressing the spring. Push the impeller down until it seats against the shoulder on the impeller shaft.
 - Push the retaining pin (2) to either side so that the impeller is captive and cannot be moved off the impeller shaft (3) by the spring tension or other forces.
 - The retaining pin (2) will remain in the configuration shown in **Figure 28** by spring and centrifugal force during operation of the pump.



FIG. 26 - SIDE VIEW OF ROTARY SEAL ON IMPELLER SHAFT

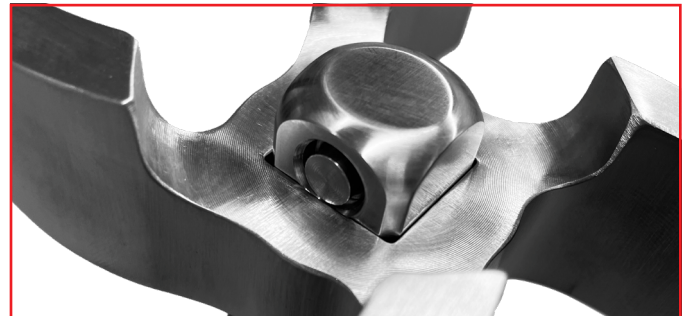


FIG. 27 - IMPELLER RETAINING PIN FLUSH FOR IMPELLER INSTALL

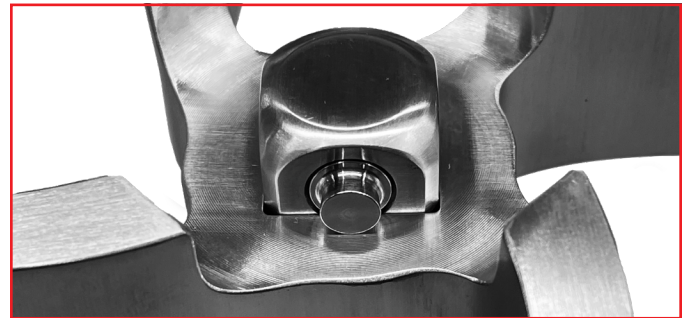


FIG. 28 - IMPELLER RETAINING PIN ENGAGED TO ONE SIDE

\\ASSEMBLY INSTRUCTIONS – SP51/SP61/SP81

7. Set the impeller (11) clearance from the backplate (6) – **specification is 0.06” +/- 0.01” clearance.**
 - A. Loosen the set screws in the impeller shaft (3) using a 5/32” hex wrench.
 - B. Using a feeler gauge between the impeller (11) and backplate (6), push the impeller onto the gauge and tighten the set screws on the impeller shaft
 - Check all impeller blades. If any of them exhibit clearances under the low-end of the clearance tolerance, repeat steps 7A and 7B until the minimum clearance is met on all impeller blades.
 - Double check that all set screws on the impeller shaft (3) are tight. Re-apply threadlocker if several iterations of steps 7A and 7B were required.

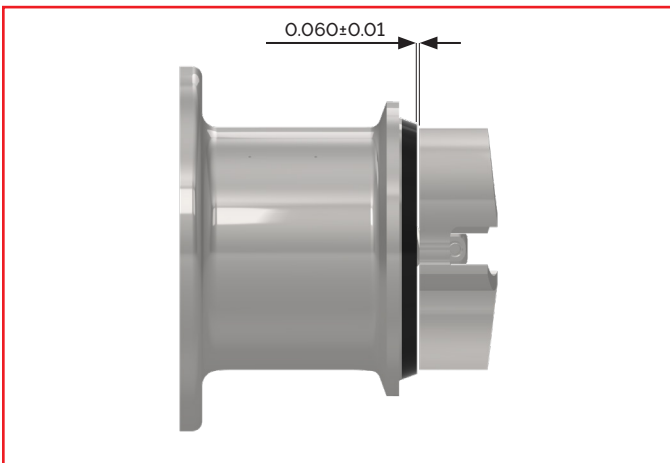


FIG. 29 - IMPELLER CLEARANCE MEASUREMENT

\\ASSEMBLY INSTRUCTIONS – SP51/SP61/SP81

8. Install the pump head (13) (sometimes called pump casing).

A. Prepare the pump head clamp (14).

- Apply food grade anti-seize to the threads on the hand nut / tee nut.
- The hinged receiver will swing over and capture the round perpendicular peg on the threaded rod. **Figure 31** shows the pump head clamp mechanism.
- Adjust the tee nut so that the threaded rod protrudes as far as possible.

B. Present the pump head (13) to the backplate (6) using a laser or bubble level on the discharge port to ensure orientation is correct.

- Check that the gap between the pump head (13) and backplate (6) is even all the way around the circumference. Visual inspection should show approximately a 1/64-1/32" gap as shown in **Figure 32**.



FIG. 31 - PUMP HEAD CLAMP DETAIL

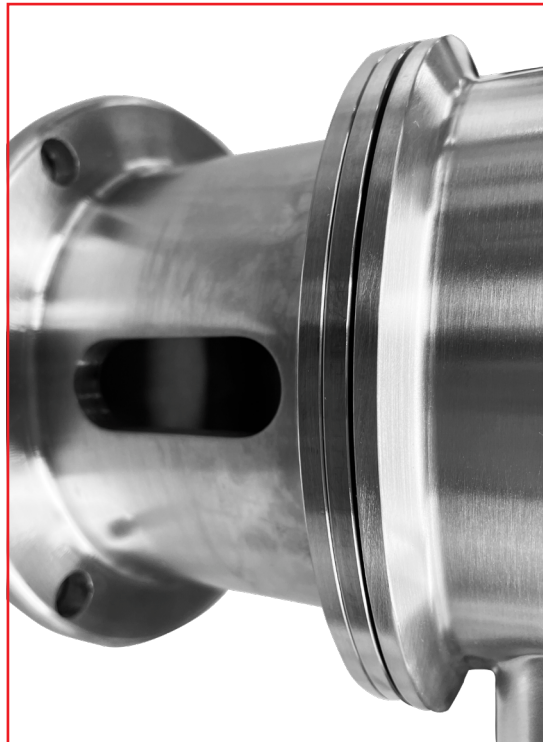


FIG. 32 - PUMP HEAD-TO-BACKPLATE GAP

\\ASSEMBLY INSTRUCTIONS - SP51/SP61/SP81

C. Install the pump head clamp (14).

- Spread the pump head clamp enough to fit around the joint.
- Fasten the hinged portion of the clamp around threaded rod portion (Figure 33).
- Tighten the tee nut by hand until hand tight with moderate force .



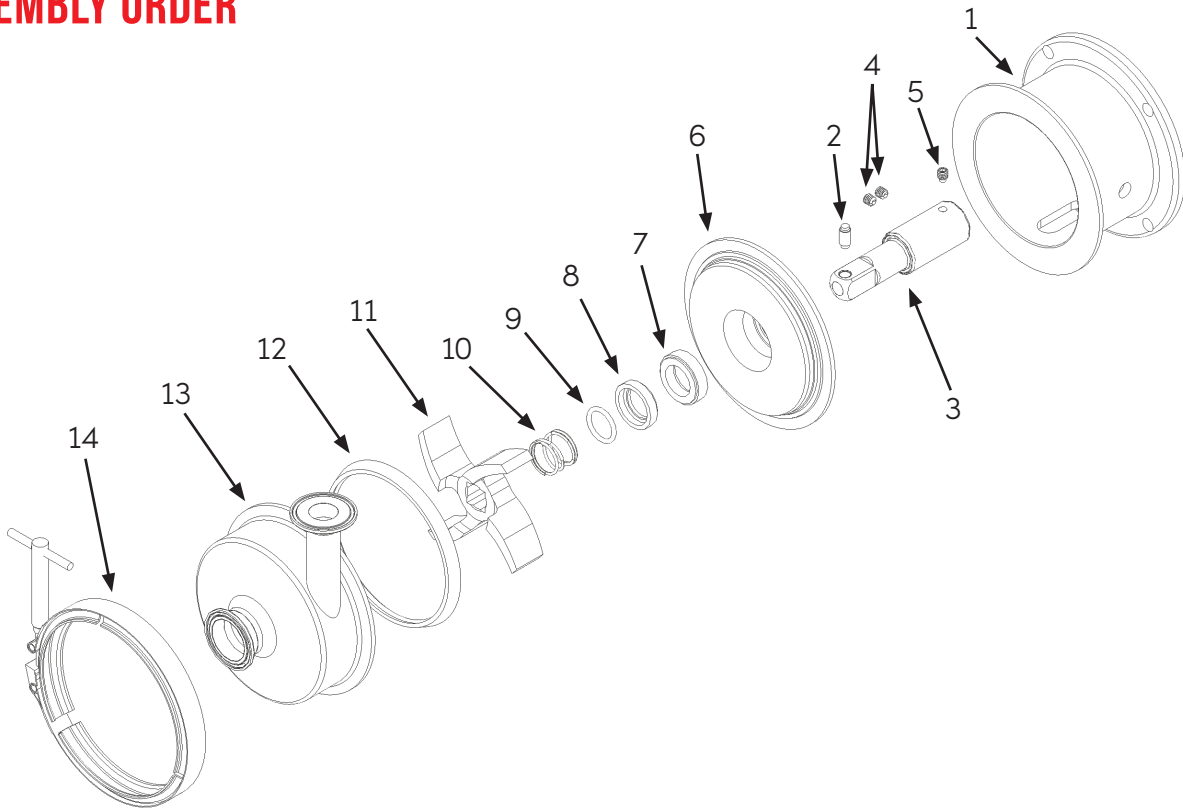
FIG. 33 - PUMP HEAD CLAMP DETAIL



FIG. 34 - PUMP HEAD AND PUMP HEAD CLAMP ASSEMBLED

EXPLODED DIAGRAM - SP51

IN ASSEMBLY ORDER



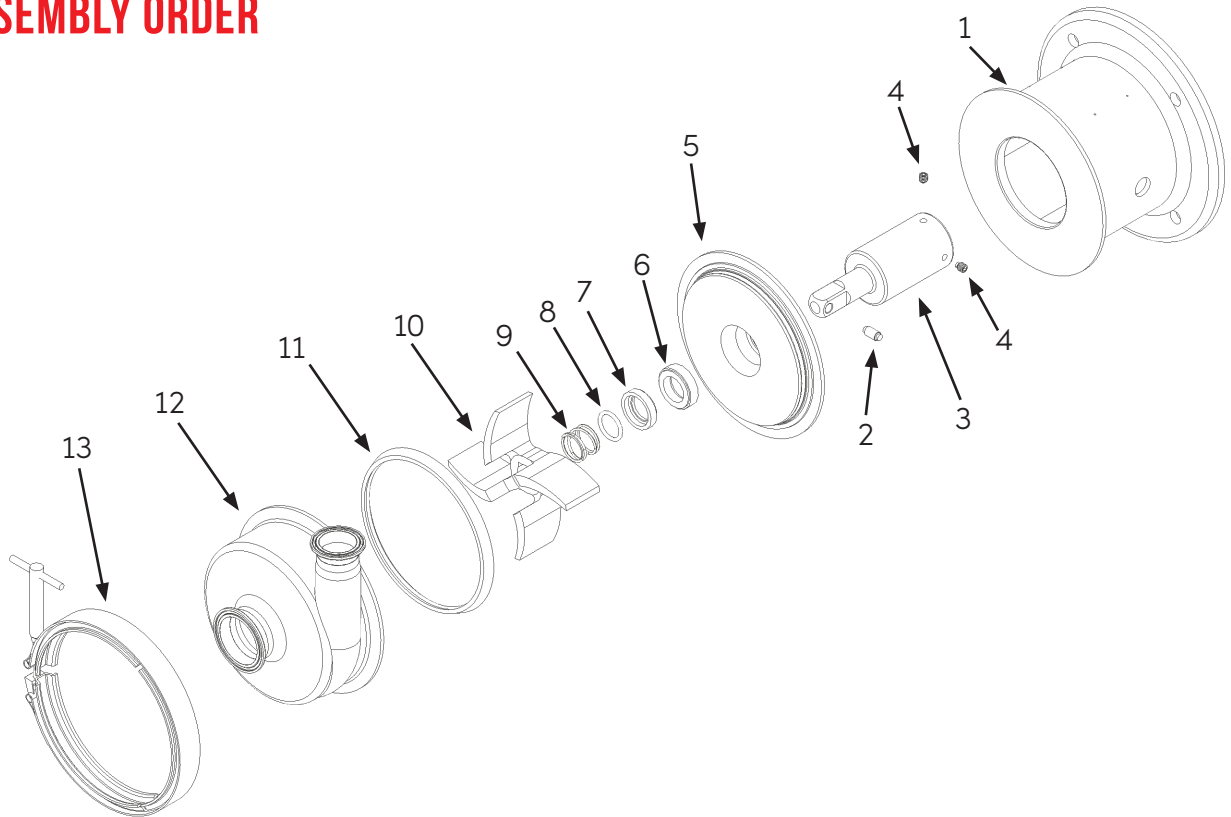
SP51 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP51-19-56	Pump Adapter	1	
2	SP26-51	Retaining Pin	1	
3	SP6-51-56 SP6-51-145	Impeller Shaft	1	
4	SP6-41-SSFDP	Set Screw (for -56 Shaft only)	2	
5	10B-1.5-HSP-NP	Set Screw (for -56 Shaft)	1	
		Set Screw (for -145 Shaft)	2	
6	SP51-11	Backplate	1	
7	SP51-80C	Ceramic Stationary Seal	1	▲
8	SP51-80T SP51-80TC	Rotary Seal PTFE	1	▲
		Rotary Seal Carbon		
9	SP51-80N	Seal O-Ring	1	▲
10	SP51-80S	Spring	1	▲
11	SP51-2-Size	Impeller	1	
12	SP40-215	Backplate Gasket	1	
13	SP51-1	Pump Head	1	
14	SP51-13HC	Pump Head Clamp	1	

▲ Included in SP51-SK Seal Kit

2" Inlet x 2" Outlet available upon request

EXPLODED DIAGRAM - SP61

IN ASSEMBLY ORDER



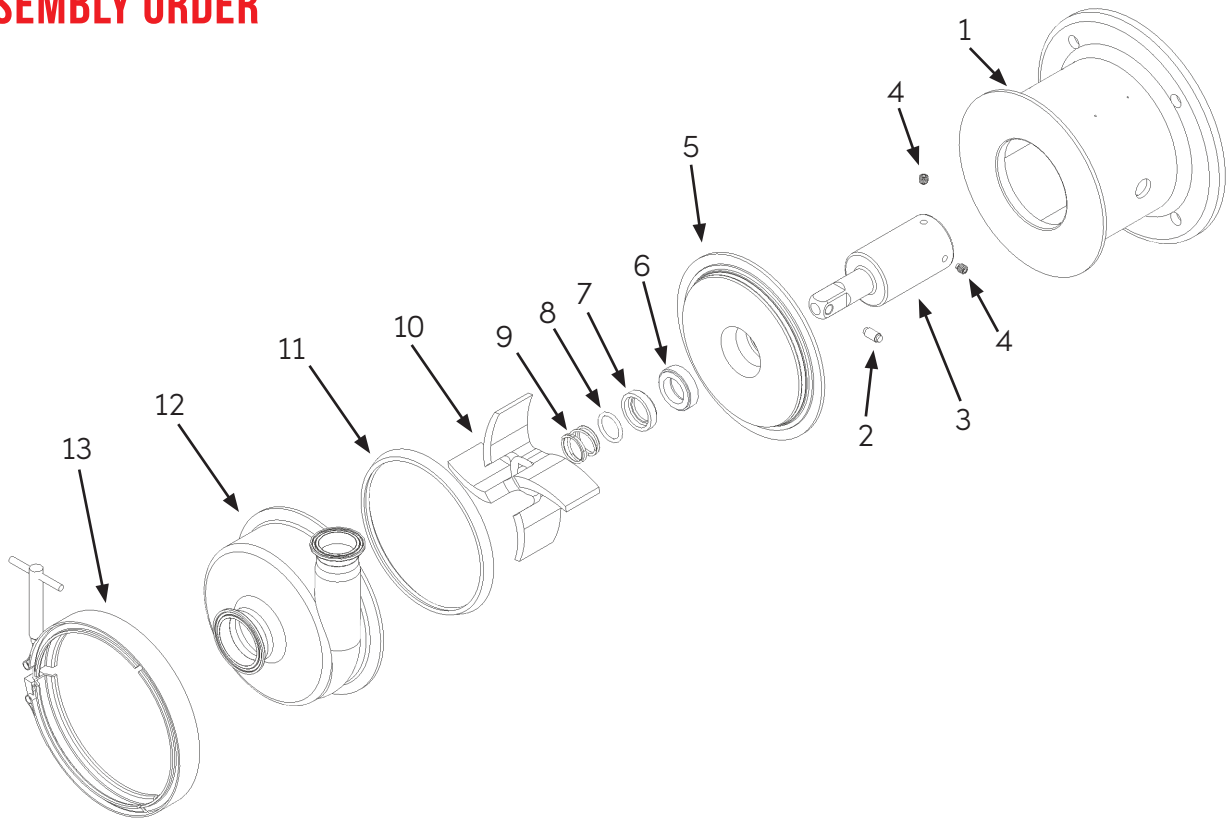
SP61 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP61-19-56 SP61-19-184	Pump Adapter	1	
2	SP26-51	Retaining Pin	1	
3	SP6-61-184 SP6-61-215 SP6-61-256	Impeller Shaft	1	
4	10B-1.5-HSP-NP	Set Screw	2	
5	SP61-11	Backplate	1	
6	SP51-80C	Ceramic Stationary Seal	1	▲
7	SP51-80T SP51-80TC	Rotary Seal PTFE Rotary Seal Carbon	1	▲
8	SP51-80N	Seal O-Ring	1	▲
9	SP51-80S	Spring	1	▲
10	SP61-2-Size	Impeller	1	
11	SP40-216	Backplate Gasket	1	
12	SP61-1	Pump Head	1	
13	SP61-13HC	Pump Head Clamp	1	

▲ Included in SP61-SK Seal Kit

2" Inlet x 2" Outlet available upon request

EXPLODED DIAGRAM - SP81

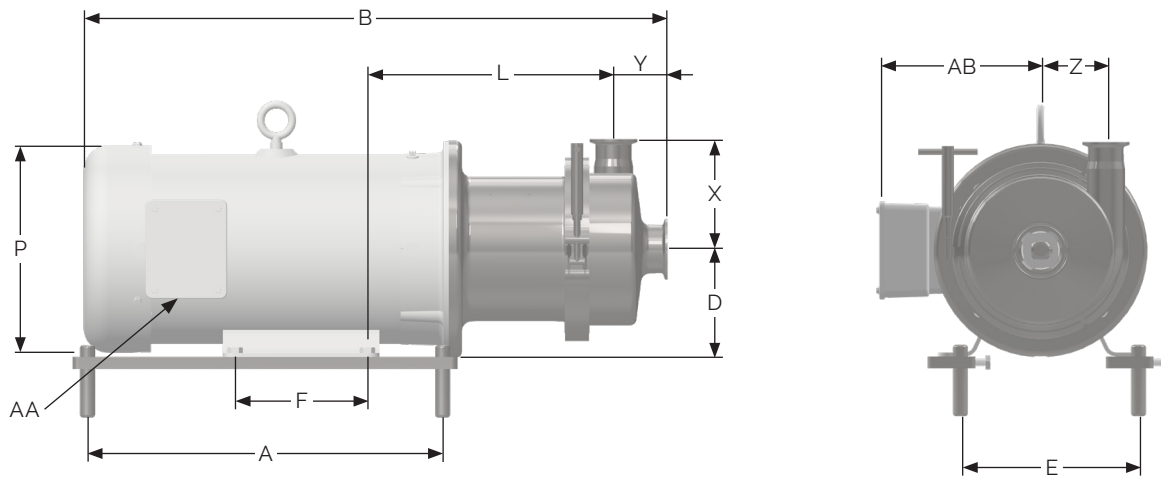
IN ASSEMBLY ORDER



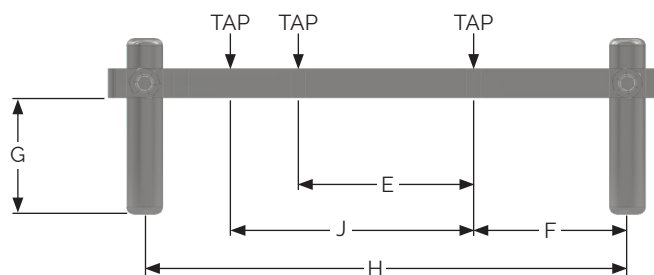
SP81 Spare Parts				
Item #	Part Number	Description	Qty	Kit
1	SP81-19-184	Pump Adapter	1	
2	SP26-81	Retaining Pin	1	
3	SP6-81-184 SP6-81-215 SP6-61-256	Impeller Shaft	1	
4	10B-1.5-HSP-NP	Set Screw	2	
5	SP81-11	Backplate	1	
6	SP81-80C	Ceramic Stationary Seal	1	▲
7	SP81-80T SP81-80TC	Rotary Seal PTFE Rotary Seal Carbon	1	▲
8	SP81-80N	Seal O-Ring	1	▲
9	SP81-80S	Spring	1	▲
10	SP81-2-Size	Impeller	1	
11	SP40-218	Backplate Gasket	1	
12	SP81-1	Pump Head	1	
13	SP81-13HC	Pump Head Clamp	1	

▲ Included in SP81-SK Seal Kit

\\DIMENSIONS



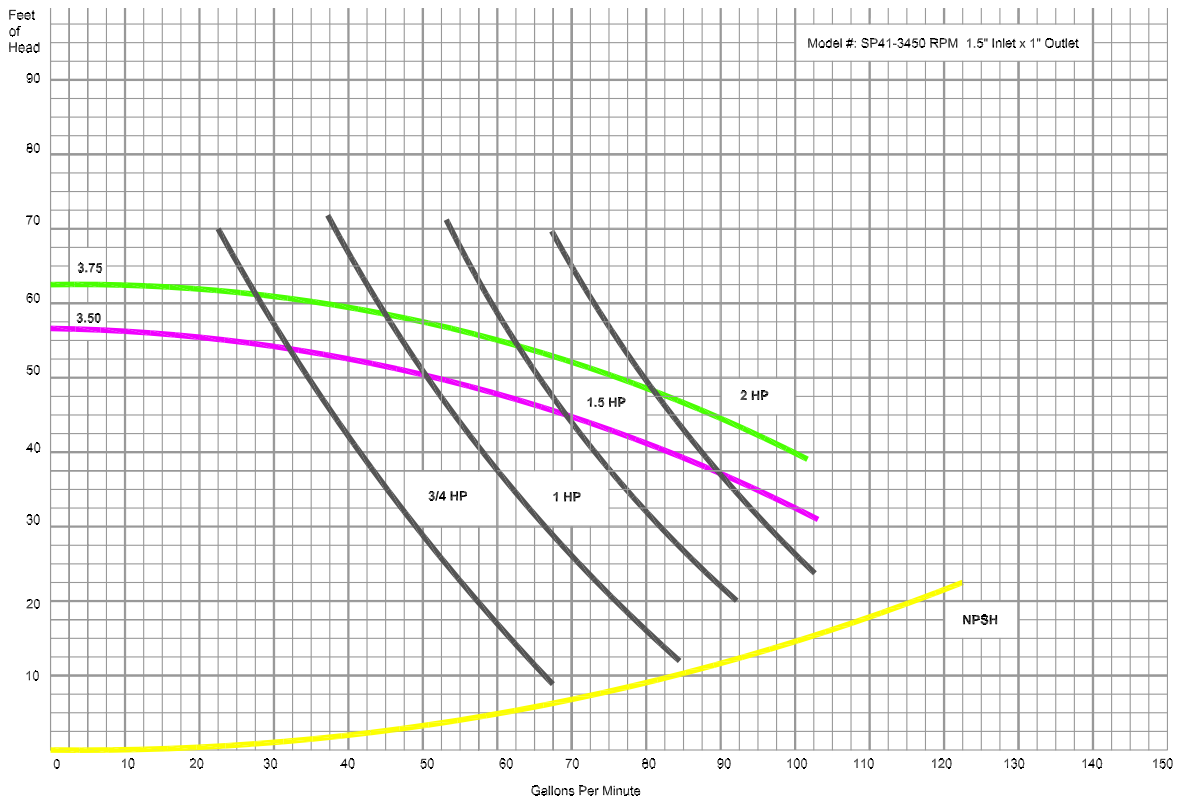
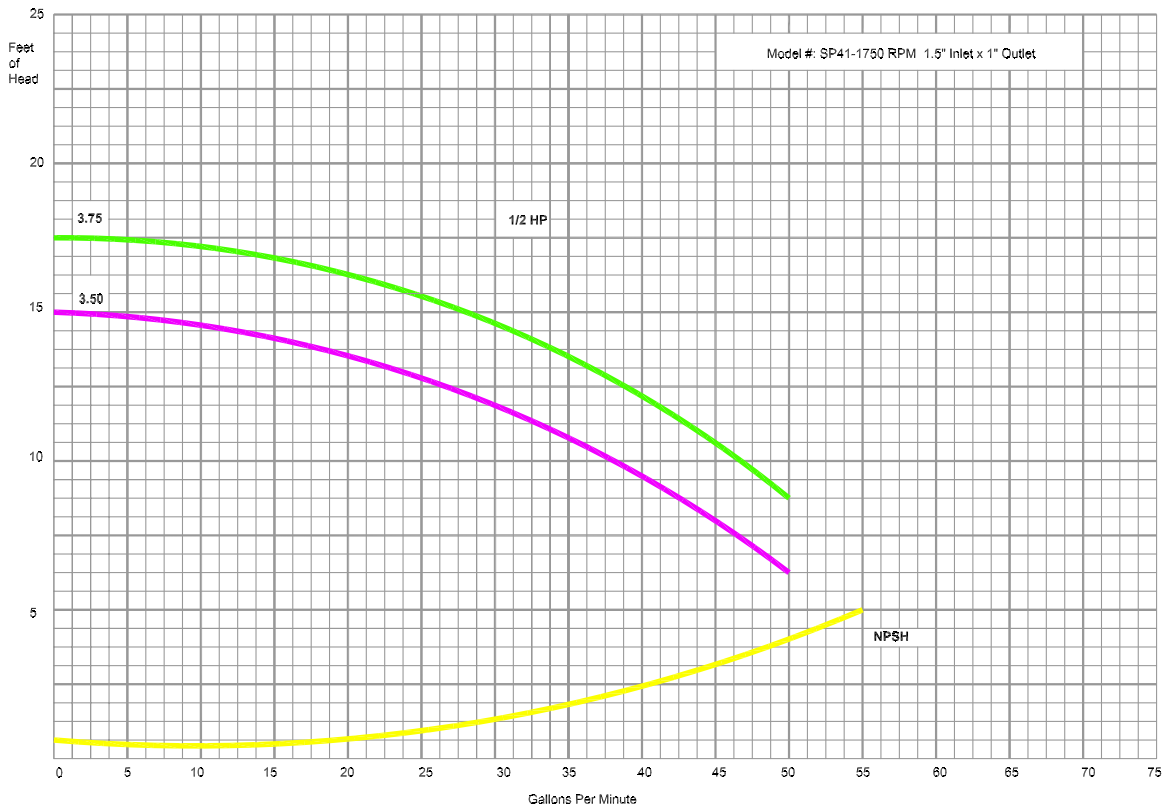
MODEL	FRAME SIZE	A	AA	AB	B	D	E	F	L	X	Y	Z
SP41	56C	8-1/4	1/2	5-13/16	*	3-1/2	4-7/8	3	6-9/16	3-15/16	1-5/8	1-1/2
SP51	56C	8-1/4	1/2	5-13/16	*	3-1/2	4-7/8	3	7-3/16	4-1/2	2	2
SP51	145TC	8-1/4	3/4	5-13/16	*	3-1/2	5-1/2	5	7-1/2	4-1/2	2	2
SP61	145TC	8-1/4	3/4	5-13/16	*	3-1/2	5-1/2	5	7-1/4	4-1/2	2-1/4	2-3/4
SP61	184TC	14-3/4	3/4	6-7/8	*	4-1/2	7-1/2	5-1/2	9-5/8	4-1/2	2-1/4	2-3/4
SP61	215TC	14-3/4	3/4	8-1/16	*	5-1/4	8-1/2	7	10-3/8	4-1/2	2-1/4	2-3/4
SP81	184TC	14-3/4	3/4	6-7/8	*	4-1/2	7-1/2	5-1/2	9-7/8	6-1/8	2-5/8	3-11/16
SP81	215TC	14-3/4	3/4	8-1/16	*	5-1/2	8-1/2	7	10-5/8	6-1/8	2-5/8	3-11/16
SP81	256TC	21	1	9-13/16	*	6-1/4	10	10	11-3/8	6-1/8	2-5/8	3-11/16



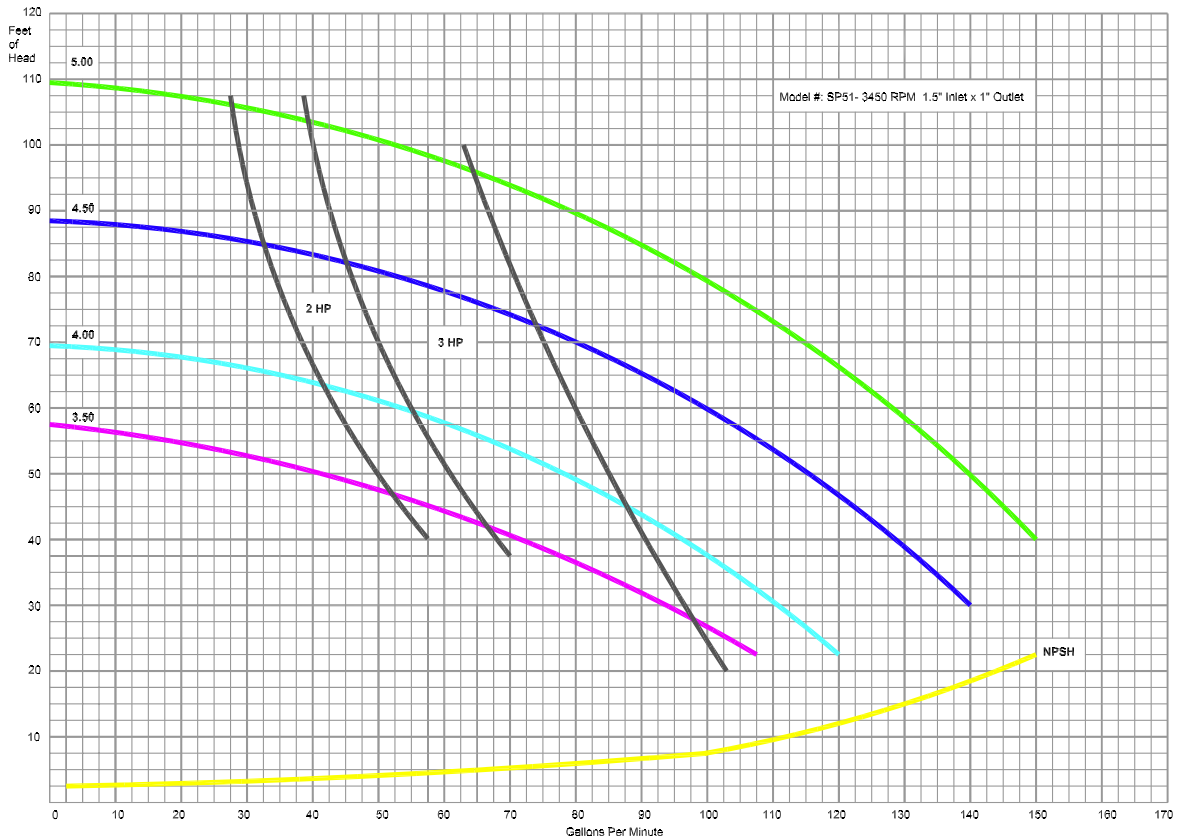
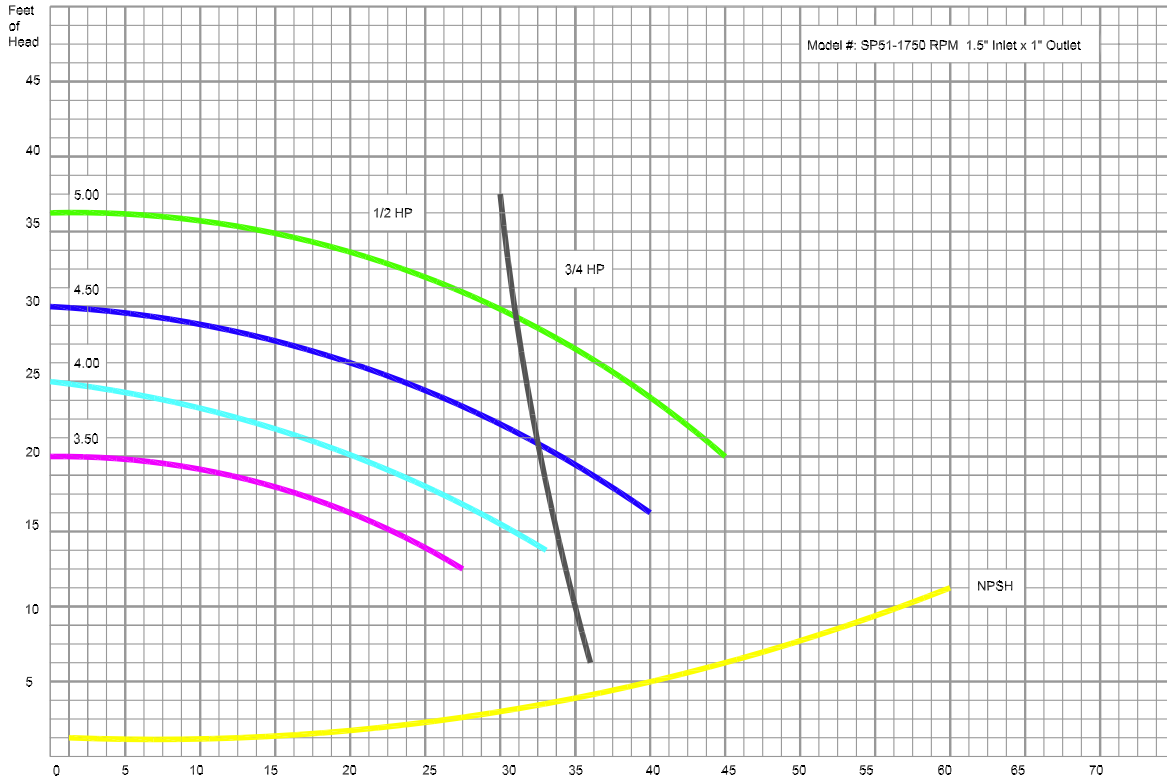
MODEL	FRAME SIZE	OAL	E	F	G	H	J	TAP/ THREAD	PART NUMBER
SP41	56C	9-1/2	3	3-1/4	4*	8-1/4	5	5/16-18	SP51-LA-56/145
SP51	145TC								
SP61	145TC								
SP61	184TC	16	5-1/2	3-3/4	4*	14-3/4	7	3/8-16	SP-LA-184/215
SP81	184TC								
SP61	215TC								
SP81	215TC	22	10	7	4*	20-3/4	-	1/2-13	SP-LA-256
SP81	256TC								

*4" is the minimum distance from the floor to the bottom of the leg bracket per 3-A 02-12. Install the leg at 4" or greater for proper sanitation.

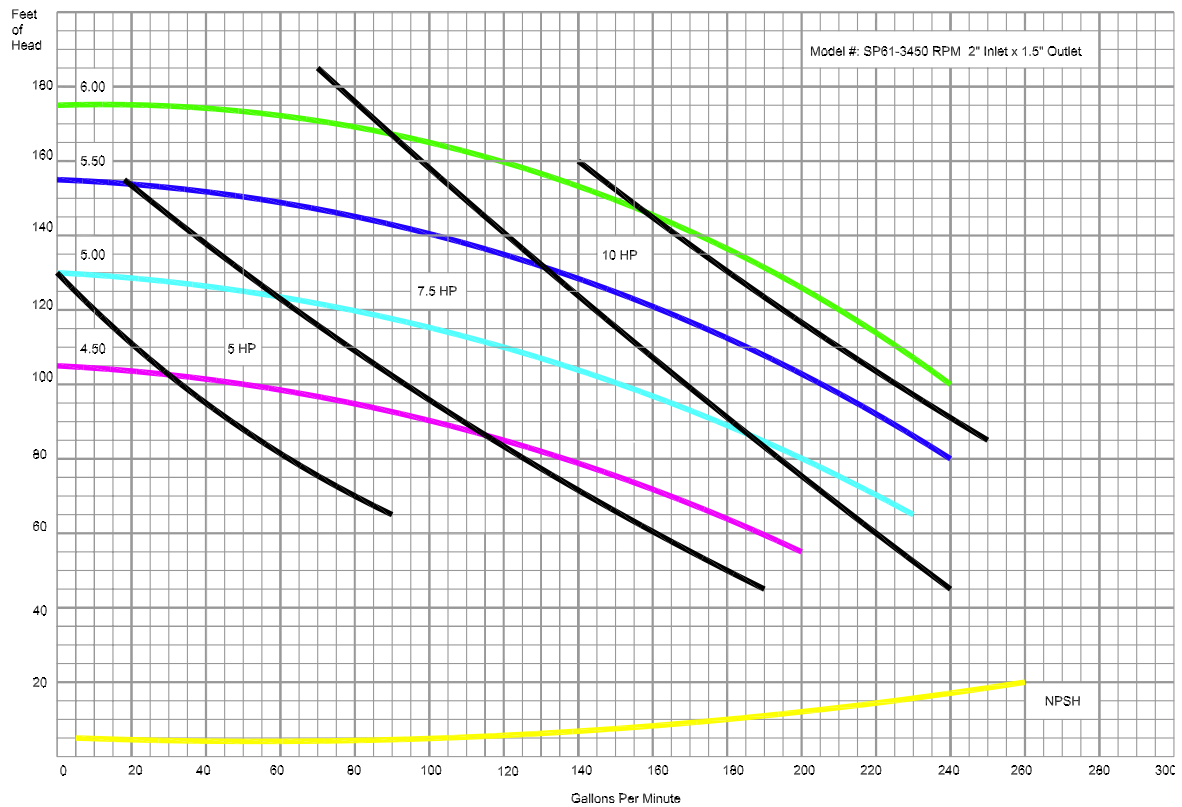
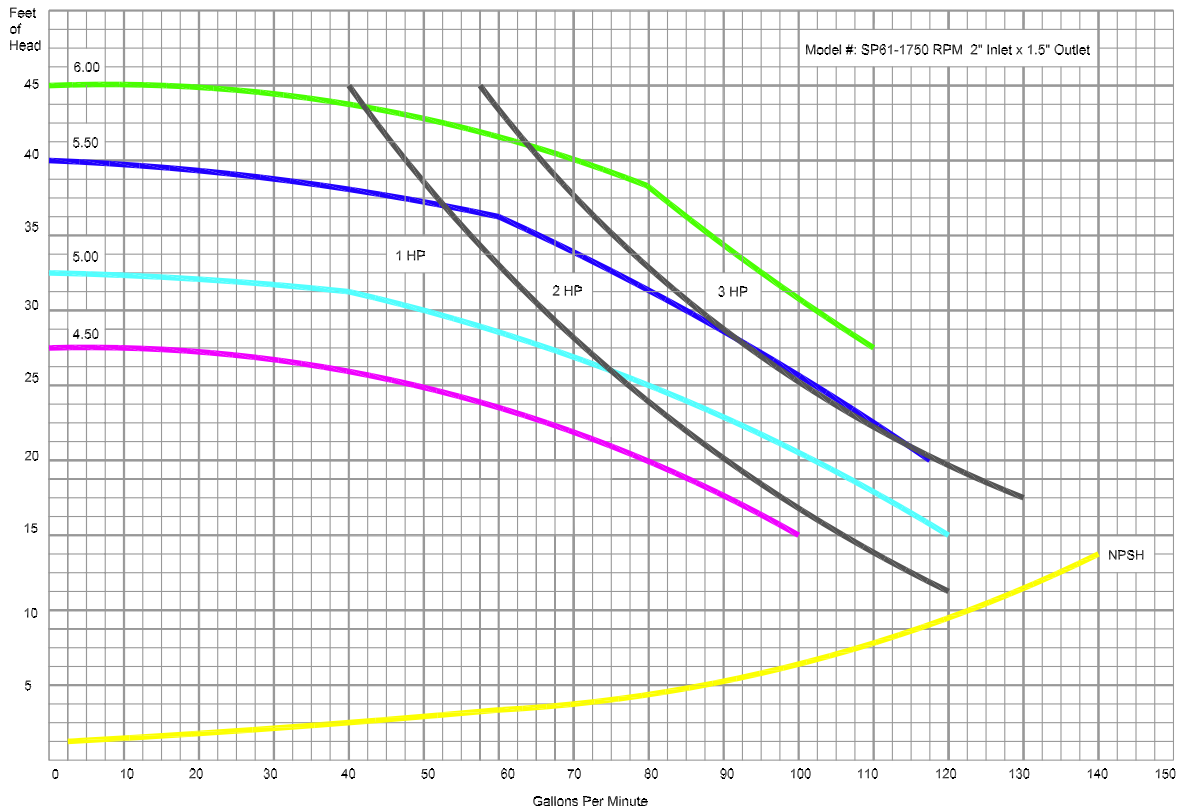
\\PUMP CURVES - SP41



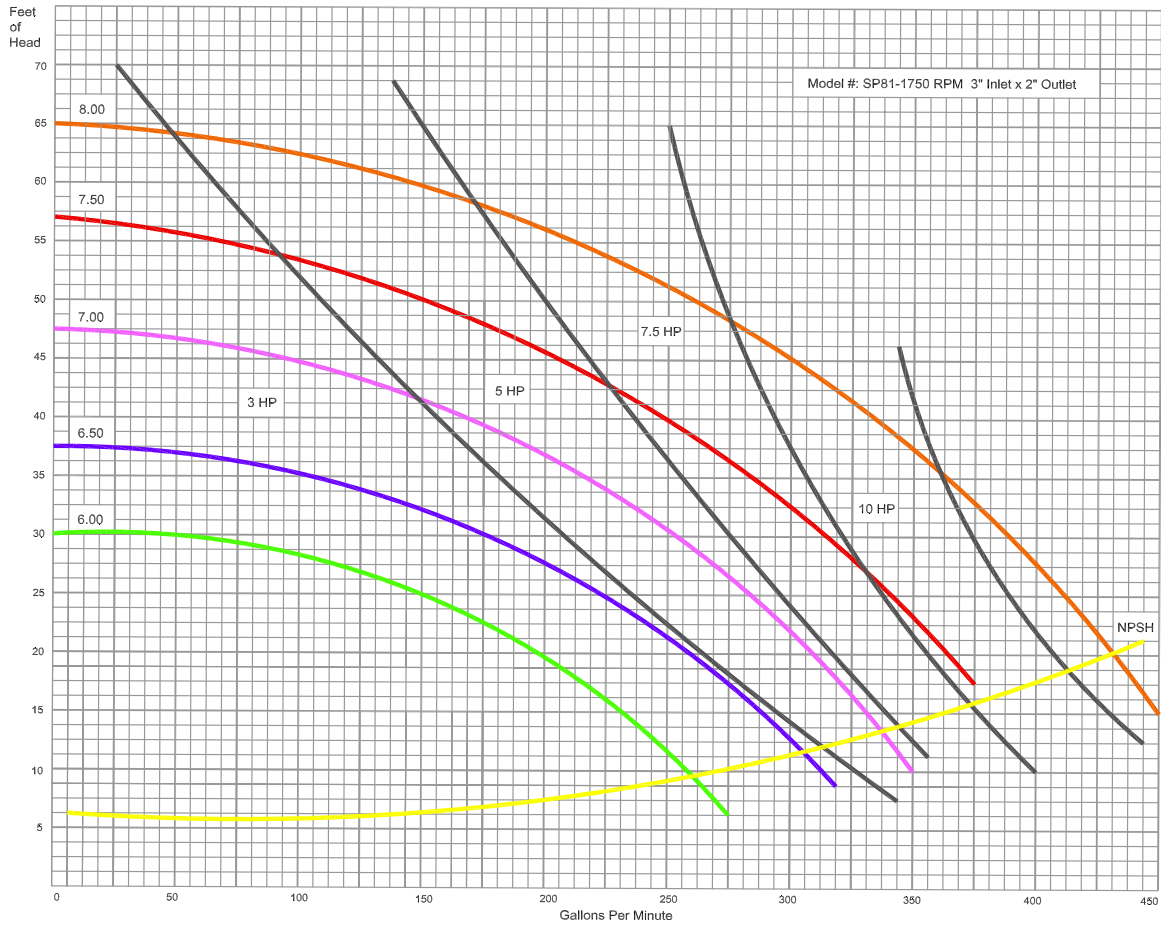
\\PUMP CURVES - SP51



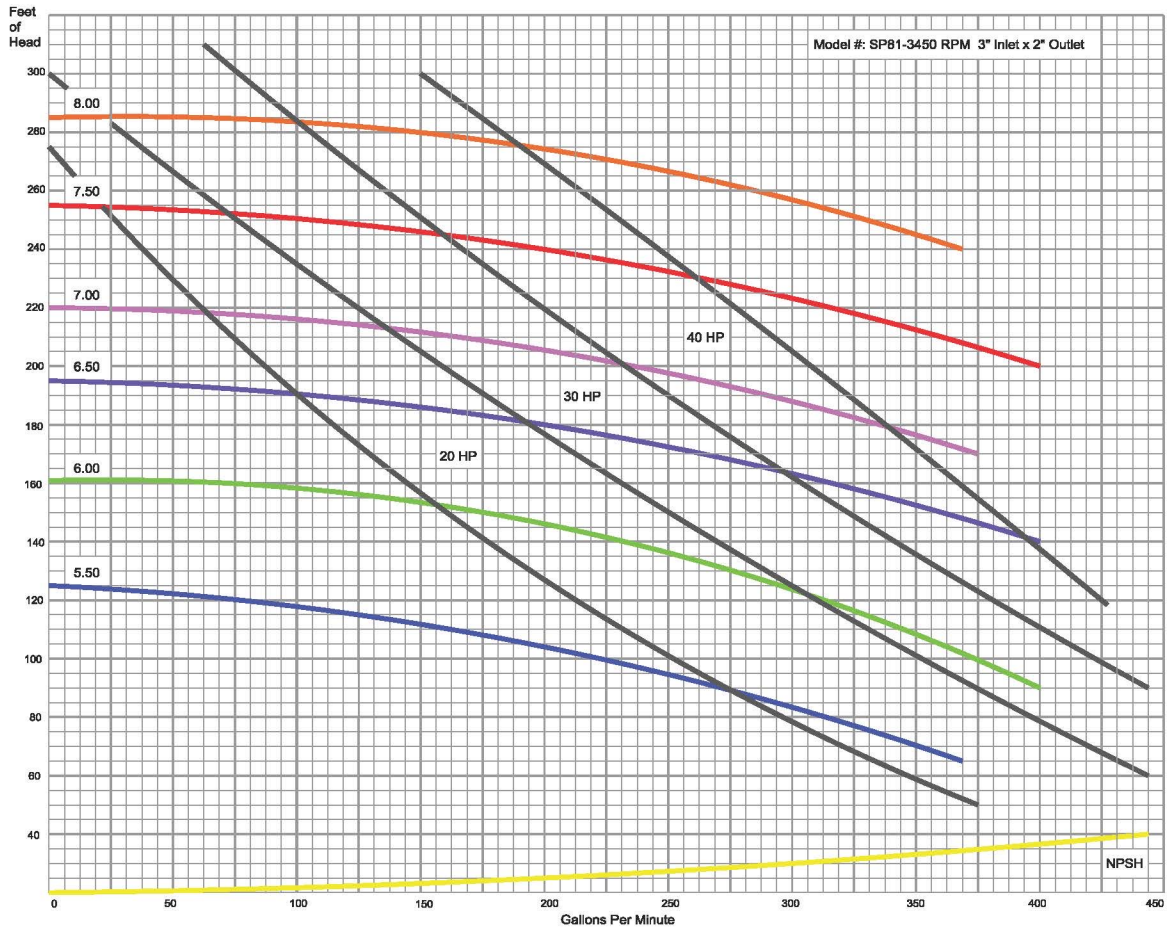
\\PUMP CURVES - SP61



\\PUMP CURVES - SP81



\\PUMP CURVES - SP81



\\FRICITION LOSS CHART

Capacity in US GPM	O.D.- 1"			O.D.- 1.5"			O.D.- 2"			O.D.- 2.5"			O.D.- 3"			O.D.- 4"		
	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee
2	0.01	0.01	0.1															
4	0.02	0.02	0.2															
5	0.03	0.02	0.25															
10	0.12	0.06	0.4	0.02	0.01	0.15	0.00	0.01	0.1									
15	0.25	0.1	0.8	0.04	0.02	0.25	0.01	0.02	0.15									
20	0.43	0.22	1.5	0.06	0.03	0.3	0.02	0.02	0.2	0.00	0.02	0.1	0.00	0.02	0.06			
25	0.66	0.4	2.3	0.08	0.04	0.4	0.02	0.03	0.25	0.00	0.03	0.15	0.00	0.03	0.08			
30	0.93	0.7	3.3	0.10	0.06	0.55	0.03	0.05	0.3	0.00	0.05	0.2	0.00	0.04	0.1			
35	1.22	1.25	5.2	0.13	0.09	0.8	0.04	0.06	0.4	0.01	0.06	0.25	0.00	0.05	0.13			
40				0.17	0.11	1	0.05	0.08	0.5	0.01	0.07	0.3	0.00	0.06	0.15			
45				0.21	0.16	1.3	0.06	0.1	0.6	0.02	0.09	0.35	0.00	0.06	0.18			
50				0.25	0.2	1.6	0.07	0.12	0.7	0.02	0.1	0.4	0.01	0.07	0.2			
60				0.34	0.35	2.2	0.1	0.18	0.9	0.03	0.12	0.45	0.01	0.08	0.25			
80				0.57	0.76	3.7	0.16	0.3	1.5	0.05	0.15	0.55	0.02	0.1	0.4			
100				0.85	1.35	5.8	0.23	0.44	2.3	0.07	0.18	0.6	0.03	0.11	0.5	0.00	0.04	0.1
120				1.18	2.05	9.1	0.32	0.64	3.3	0.10	0.21	1	0.04	0.13	0.6	0.01	0.05	0.15
140							0.42	0.85	4.5	0.14	0.23	1.25	0.05	0.16	0.8	0.01	0.06	0.2
160							0.54	1.13	5.8	0.17	0.28	1.6	0.07	0.2	1.1	0.01	0.07	0.25
180							0.67	1.45	7.4	0.20	0.31	2	0.08	0.21	1.3	0.02	0.08	0.3
200							0.81	1.82	9	0.24	0.35	2.5	0.1	0.26	1.6	0.02	0.09	0.4
220							0.95	2.22	11	0.29	0.41	3	0.12	0.3	1.9	0.02	0.1	0.5
240							1.1	2.63	13.5	0.34	0.48	3.7	0.14	0.33	2.2	0.03	0.11	0.55
260										0.39	0.53	4.5	0.16	0.39	2.5	0.04	0.11	0.6
280										0.45	0.61	5.3	0.19	0.42	2.8	0.04	0.12	0.65
300										0.51	0.7	6.2	0.22	0.5	3.1	0.05	0.13	0.7
350										0.68	1.05	8.5	0.28	0.67	4.1	0.07	0.15	0.9
400										0.86	1.55	11	0.36	0.88	5.2	0.08	0.18	1.2
450										1.05	2.25	13.5	0.44	1.1	6.6	0.10	0.2	1.5
500													0.54	1.4	8	0.13	0.23	1.75
550													0.64	1.7	9.5	0.15	0.27	2.1
600													0.75	2.05	10.2	0.17	0.3	2.5
650													0.87	2.41	13	0.2	0.34	2.8
700													1	2.8	15	0.23	0.4	3.4
750																0.26	0.43	3.8
800																0.3	0.5	4.4
850																0.33	0.56	5
900																0.37	0.62	5.7
950																0.41	0.7	6.3
1000																0.45	0.8	7
1100																0.53	1.06	8.6

Test Medium = Water at 70°F

WARRANTY

- A. **GENERAL PROVISIONS:** Stainless Products, LLC (the “Company”) warrants exclusively to the original purchaser (the “Customer”) that equipment or parts thereof manufactured and sold by the Company will be free from defects in material and workmanship only, under normal use and service, for a period of one (1) year from the original shipment date. The Company shall not be liable for any loss of revenue or profit, loss by reason of plant shutdown, non-operation or increased cost of operation, loss of products or materials, or other special or consequential loss or damages resulting from any such warranted defects. This warranty will not apply to any equipment or parts which has been subjected to accident, alteration, abuse, or misuse. This warranty is in lieu of all other warranties. All other warranties, both express or implied (including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose) warranties are hereby excluded and waived. The Company’s only obligation and liability shall be to fulfill the warranty specifically stated herein. The Company will neither assume nor authorize any other person to assume for it any other obligation or liability in connection with the equipment or parts. In the event of a claim under this warranty, the Company’s sole and exclusive liability for any warranted equipment or parts shall be, at the Company’s option, limited to the following (a) the purchase price of the equipment or parts that are defective, (b) replacement of the defective equipment or parts or (c) repair of the defective equipment or parts.
- B. **RETURN OF PARTS OR EQUIPMENT TO COMPANY PLANT:** In the event the Company elects to inspect the alleged defective equipment or parts for possible repair, Company will notify Customer in writing, and the equipment or parts must be returned with transportation cost prepaid by the Customer. In the event the Company’s inspection confirms defective equipment or parts covered by this warranty, the Company shall have the option to select any of the remedies described in Section A above. No transportation for returned or replaced items will be paid by the Company unless written approval for transportation charges is given by the Company.
- C. **COMPONENTS NOT MANUFACTURED BY THE COMPANY:** Components not manufactured by the Company, but furnished as part of its equipment will be warranted by the Company only to the extent of the component manufacturer’s warranty.
- D. **REPAIR OF EQUIPMENT INSTALLED IN THE CONTINENTAL UNITED STATES:** In the event the Company elects to repair a covered item and it is, in the judgement of the Company, impractical to return the equipment or parts for repairs, the Company may arrange for the repairs to be made by its personnel or, at its option, sublet such repairs to a qualified company. The Customer will be expected to cooperate by making the equipment or parts available and accessible when the work is scheduled and is expected to provide the necessary utilities. If local labor conditions prohibit such work being done by Company personnel under the conditions and at the rates payable by its contracts with its employees, the Company obligation shall be limited to supervision of the work, replacement of defective parts, and labor costs in an amount equal to the amount which would be payable for a reasonable number of hours required to make the repairs at the rates payable under the terms of Company contracts with

\\WARRANTY

its employees. In such event, all labor costs shall be paid by the Customer and the Company will reimburse the Customer to the extent set forth above.

- E. REPAIR OF EQUIPMENT INSTALLED OUTSIDE THE CONTINENTAL UNITED STATES: In the event the Company elects to repair a covered item for a Customer located outside the continental United States and it is, in the judgement of the Company, impractical to return the equipment for repairs, the Company shall have the additional options (in addition to the other options described herein) of either sending a service representative to repair (or supervise the repairs) or paying Customer a reasonable amount to allow the Customer to have the repairs made locally; provided, that in such situation, Company shall have no obligation to repair or replace equipment or parts that are repaired on by third party contractors selected by Customer.

