SP SERIES PUMPS

SEALLESS SELF-PRIME

Performance Curves
FT06-935 R2
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Note: For performance curves of lifts between 15 and 25 feet, please contact the factory.
SP Series Application Guidelines

SP Series pumps are applied similar to other Finish Thompson mag drive centrifugal pumps, but there are a few special considerations.

**Equivalent Lift**

Performance varies with the amount of lift. This calculation allows you to determine which SP performance curve you should use based upon the height of the application’s lift.

SP Series pumps are capable of lifting fluid from as deep as 25 feet (7.6 meters) below the pump depending upon the model and impeller diameter. However, factors such as pipe friction loss, specific gravity and altitude can decrease a pump’s maximum lift capability. Adjustments must be calculated to ensure that both the proper performance curves are being used and that the lift required is within the pump’s maximum lift capability.

If corrections are required for both altitude and specific gravity, first make the adjustment for altitude; then make the adjustment for specific gravity on altitude-adjusted value.

- **Altitude** – Maximum suction lift capability is reduced by 1.13 feet (.34 meters) for every 1,000 feet (304 meters) of altitude. For example, if the pump is going to be installed at an altitude of 5,000 feet (1.5 kilometers), then the maximum lift is reduced by 5.65 feet (1.7 meters).

- **Specific gravity** – Divide the model’s maximum lift capability by the specific gravity of the fluid. For example, if you are pumping a fluid with a specific gravity of 1.84, and the maximum lift on water is 25 feet (7.6 meters), then the adjusted maximum lift is 13.6 feet (4.1 meters).

**Suction Pipe Size**

Hydraulic performance is enhanced in lift applications using SP10 and SP22 models with a larger suction pipe. Curves have been prepared showing performance for the SP10 with 1” and 1 1/2” and the SP22 with 2” and 3” suction pipes at various lifts. Note the priming time increases as suction pipe diameter increases. Refer to the prime time charts section for the SP10 and SP22 before selecting a final suction pipe diameter.

Use flooded suction curves when the pump is installed below the liquid level. When a pump is positioned below the liquid level, the pump should be considered to be operating with a flooded suction (See figure 1). In those cases, use the SP flooded suction published performance curves.

If you have any questions, please contact FTI sales. We are here to help!

**Temperature Rise During Priming**

The priming liquid in the housing will rise approximately 3º F (1.6º C) per minute while the pump is priming. This information is based on cold water testing at FTI.
Temperature Rise During Priming

The priming liquid in the housing will rise approximately 3º F (1.6º C) per minute while the pump is priming. This information is based on cold water testing at FTI.
PERFORMANCE WITH 1" OR 1-1/2" SUCTION PIPING
SP10, 3450 RPM, 60 Hz, Flooded Suction
Suction: 1" FNPT; Discharge: 1" MNPT

Maximum Lift
3450 rpm, 1.0 sg

<table>
<thead>
<tr>
<th>Imp Curve</th>
<th>1-inch Suction Pipe</th>
<th>1-1/2-inch Suction Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>25' (7.6 m)</td>
<td>25' (7.6 m)</td>
</tr>
<tr>
<td>#2</td>
<td>25' (7.6 m)</td>
<td>25' (7.6 m)</td>
</tr>
<tr>
<td>#3</td>
<td>20' (6.1 m)</td>
<td>20' (6.1 m)</td>
</tr>
<tr>
<td>#4</td>
<td>20' (6.1 m)</td>
<td>15' (4.6 m)</td>
</tr>
<tr>
<td>#5</td>
<td>15' (4.6 m)</td>
<td>15' (4.6 m)</td>
</tr>
<tr>
<td>#6</td>
<td>10' (3.0 m)</td>
<td>10' (3.0 m)</td>
</tr>
</tbody>
</table>

SP10, 2900 RPM, 50 Hz, Flooded Suction
Suction: 1" FNPT; Discharge: 1" MNPT

Maximum Lift
2900 rpm, 1.0 SG

<table>
<thead>
<tr>
<th>Imp Curve</th>
<th>1-inch Suction Pipe</th>
<th>1-1/2-inch Suction Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>7.6 m</td>
<td>7.6 m</td>
</tr>
<tr>
<td>#2</td>
<td>7.6 m</td>
<td>6.1 m</td>
</tr>
<tr>
<td>#3</td>
<td>6.1 m</td>
<td>4.6 m</td>
</tr>
<tr>
<td>#4</td>
<td>4.6 m</td>
<td>3.0 m</td>
</tr>
<tr>
<td>#5</td>
<td>3.0 m</td>
<td>3.0 m</td>
</tr>
<tr>
<td>#6</td>
<td>1.5 m</td>
<td>1.5 m</td>
</tr>
</tbody>
</table>
PERFORMANCE WITH 1" SUCTION PIPING

SP10, 3450 RPM, 60 Hz, 15 ft. (4.6 m) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

SP10, 2900 rpm, 50 Hz, 4.6 m (15 ft.) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

Curve Legend
#1 - 4.18" (106.2 mm)
#2 - 4.00" (101.6 mm)
#3 - 3.75" (95.3 mm)
#4 - 3.50" (88.9 mm)
#5 - 3.25" (82.6 mm)

Min. Flow - 1.9 lpm

NPSHR
GUIDELINES:
Temperature Rise During Priming
The priming liquid in the housing will rise approximately 3°F (1.6°C) per minute while the pump is priming. This information is based on cold water testing at FTI.

Note: For faster priming or additional equivalent lift, contact the factory for assistance.
Times shown are guidelines only and may vary depending upon system and piping setup.
Maximum equivalent lift varies depending upon impeller size.

GUIDELINES:
PERFORMANCE WITH 1-1/2" SUCTION PIPING
SP10, 3450 RPM, 60-Hz, 5 ft. (1.5 m) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

Flow (m³/hr)

Curve Legend
#1- 4.18" (106.2 mm)
#2- 4.00" (101.6 mm)
#3- 3.75" (95.3 mm)
#4- 3.50" (88.9 mm)
#5- 3.25" (82.6 mm)
#6- 3.00" (76.2 mm)

Min. Flow- 0.5 US gpm (1.9 lpm)

NPSHR

Head (ft)

0 2 4 6 8 10 12 14 16

Flow (US gpm)

SP10, 2900 RPM, 50 Hz, 1.5 m (5 ft.) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

Curve Legend
#1- 106.2 mm (4.18")
#2- 101.6 mm (4.00")
#3- 95.3 mm (3.75")
#4- 88.9 mm (3.50")
#5- 82.6 mm (3.25")
#6- 76.2 mm (3.00")

Min. Flow- 1.9 lpm

Flow (m³/hr)

0 2 4 6 8 10 12 14
PERFORMANCE WITH 1-1/2" SUCTION PIPING

SP10, 3450 RPM, 60 HZ, 10 ft. (3.0 m) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

SP10, 2900 RPM, 50 HZ, 3.0 m (10 ft.) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT
PERFORMANCE WITH 1-1/2" SUCTION PIPING

SP10, 3450 RPM, 60 Hz, 15 ft. (4.6 m) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

Min. Flow- 0.5 US gpm (1.9 lpm)

SP10, 2900 RPM, 50 Hz, 4.6 m (15 ft.) Equivalent Lift
Suction: 1" FNPT; Discharge: 1" MNPT

Min. Flow- 1.9 lpm
**GUIDELINES:**

**Temperature Rise During Priming**

The priming liquid in the housing will rise approximately 3°F (1.6°C) per minute while the pump is priming. This information is based on cold water testing at FTI.

*Note: Times shown are guidelines only and may vary depending on system and piping setup.*

*Note: Values shown are with maximum diameter impeller.*
SP11, 3450 RPM, 60-Hz, 10 ft. (3.0 m) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT

Flow (m³/hr)

Curve Legend
#1- 4.63" (118 mm)
#2- 4.38" (111 mm)
#3- 4.13" (105 mm)
#4- 3.88" (99 mm)
#5- 3.63" (92 mm)
1.5 Hp
.75 Hp

SP11, 2900 RPM, 50-Hz, 3.0 m (10 ft.) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT

Flow (m³/hr)

Curve Legend
#6- 133 mm (5.25")
#7- 127 mm (5.00")
#8- 121 mm (4.75")
#9- 114 mm (4.50")
#10- 108 mm (4.25")
1.1 kW
.75 kW
1.5 kW

SP11, 3450 RPM, 60-Hz, 15 ft (4.6 m) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT

SP11, 2900 RPM, 50-Hz, 4.6 m (15 ft.) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT
SP15, 3450 RPM, 60-Hz, 5 ft (1.5 m) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT

SP15, 2900 RPM, 50-Hz, 1.5 m (5 ft.) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT
SP15, 3450 RPM, 60-Hz, 10' (3.0 m) Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT

SP15, 2900 RPM, 50-Hz, 3.0 m (10') Lift
Suction: 1-1/2" FNPT; Discharge: 1-1/2" MNPT
Note: Times shown are guidelines only and may vary depending on system and piping setup.
Note: Times shown are guidelines only and may vary depending on system and piping setup.
Recommend using 2" suction pipe with impellers less than 5.50" at equivalent lifts greater than 15' (4.6 m).
SP22, 3450 RPM, 60-Hz, Flooded Suction
Suction: 2” FNPT; Discharge: 2” MNPT

Plumb with 2” or 3” Suction and 2” Discharge Pipe

Flow (m³/hr)

Spur 

NPSHR (m) Head (m)

Curve Legend
#1- 7.00” (177.8 mm)
#2- 6.50” (165.1 mm)
#3- 6.00” (152.4 mm)
#4- 5.50” (139.7 mm)
#5- 5.00” (127.0 mm)

0 5 10 15 20 25 30 35 40 45 50 55 60

0 5 10 15 20 25 30 35 40 45 50 55 60

0 25 50 75 100 125 150 175 200 225 250 275 300

NOTES:
FOR POWER REQUIREMENTS ABOVE 10HP @ 60HZ, CONTACT FACTORY FOR ASSISTANCE.
NOTE:
CURVES SHOWN WERE TESTED USING 2" SUCTION PIPING.
FOR POWER REQUIREMENTS ABOVE 10 HP @ 60HZ, CONTACT FACTORY FOR ASSISTANCE.
SP22, 3450 RPM, 60-Hz, 10 ft. (3 m) Lift
Suction: 2” FNPT; Discharge: 2” MNPT
Plumb with 2” Suction and 2” Discharge Pipe

SP22, 2900 RPM, 50-Hz, 3 m (10 ft.) Lift
Suction: 2” FNPT; Discharge: 2” MNPT
Plumb with 2” Suction and 2” Discharge Pipe

NOTES:
CURVES SHOWN WERE TESTED USING 2” SUCTION PIPING.
FOR POWER REQUIREMENTS ABOVE 10 HP @ 60HZ, CONTACT FACTORY FOR ASSISTANCE.
SP22, 3450 RPM, 60-Hz, 15 ft. Lift (4.6 m)
Suction: 2” FNPT; Discharge: 2” MNPT
Plumb with 2” Suction and 2” Discharge Pipe

SP22, 2900 RPM, 50-Hz, 4.6 m (15 ft.) Lift
Suction: 2” FNPT; Discharge: 2” MNPT
Plumb with 2” Suction and 2” Discharge Pipe

NOTES
FTI RECOMMENDS USING 2” SUCTION PIPING WITH 5” IMPELLER AT LIFTS OF 15’ (4.6 m) AND GREATER. FOR POWER REQUIREMENTS ABOVE 10HP @ 60HZ, CONTACT FACTORY FOR ASSISTANCE.
SP22, 3450 RPM, 60-Hz, 5 ft. (1.5 m) Lift
Suction: 2" FNPT; Discharge: 2" MNPT
Plumb with 3" Suction and 2" Discharge Pipe

SP22, 2900 RPM, 50-Hz, 1.5 m (5 ft.) Lift
Suction: 2" FNPT; Discharge: 2" MNPT
Plumb with 3" Suction and 2" Discharge Pipe

CURVES SHOWN WERE TESTED USING 3" SUCTION PIPING.
Curve Legend

#1- 7.00" (177.8 mm)
#2- 6.50" (165.1 mm)
#3- 6.00" (152.4 mm)
#4- 5.50" (139.7 mm)
#5- 5.00" (127.0 mm)

Minimum Continuous Flow

SP22, 3450 RPM, 60-Hz, 10 ft. (3 m) Lift
Suction: 2" FNPT; Discharge: 2" MNPT
Plumb with 3" Suction and 2" Discharge Pipe

Flow (m3/hr)

NPSHR (m)

Head (m)

1.5 BHP
2.2 BHP
3.0 kW
4.0 kW
5.5 kW

30% 42% 43% 40%

35% 43% 45%

20% 30% 40%

5 BHP

SP22, 2900 RPM, 50-Hz, 3 m (10 ft.) Lift
Suction: 2" FNPT; Discharge: 2" MNPT
Plumb with 3" Suction and 2" Discharge Pipe

Flow (m3/hr)

NPSHR (m)

Head (m)

Minimum Continuous Flow
2.3 m3/hr

NOTE: CURVES SHOWN WERE TESTED USING 3" SUCTION PIPING

6039 REV 0
SP22 5010
NOTES:
CURVES SHOWN WERE TESTED USING 3" SUCTION PIPING.
RECOMMEND USING 2" SUCTION PIPING WITH IMPELLERS LESS THAN 5.50" (139.7 MM) AT EQUIVALENT LIFTS GREATER THAN 15' (4.6M).
FOR POWER REQUIREMENTS ABOVE 10 HP, CONTACT FACTORY FOR ASSISTANCE.