

Variable Speed Pump Comparison

Option A

Enter Curve Data from Published Curve

(1 to 3 equal size pumps)

Enter Pump Description: **SS Pump A (Armstrong 3x1.5x8 4280 series)**

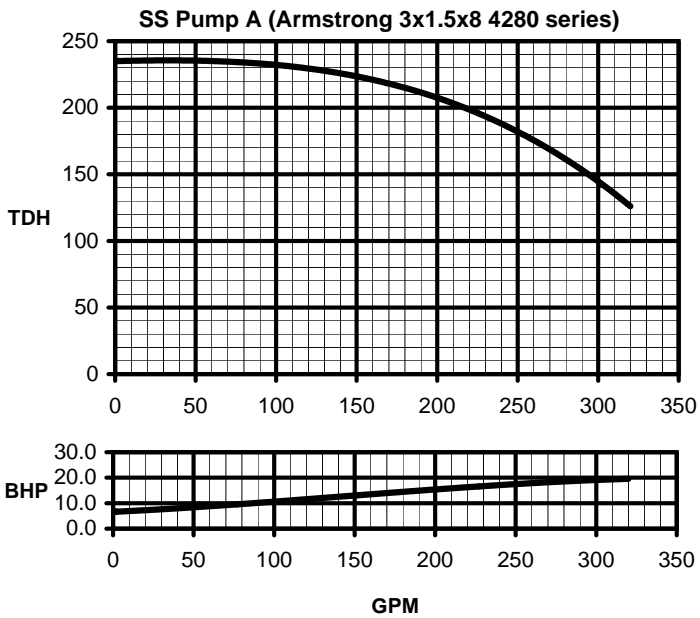
Enter Head at zero flow		235	FEET		
Enter End of curve pump performance:	320 GPM at	126	FEET at	52.0	%
Enter Head and Pump Efficiency at	80 GPM:	234	FEET	49.3	%
Enter Head and Pump Efficiency at	160 GPM:	221	FEET	65.5	%
Enter Head and Pump Efficiency at	240 GPM:	188	FEET	67.0	%

Enter Impeller Diameter for curve data above (if applicable): **7.500** in.
 Enter Impeller Trim (if applicable): _____ in.

Motor Information

HP	Nominal RPM	Eff [%] @ 100%	Eff [%] @ 75%	Eff [%] @ 50%	Eff [%] @ 25%
20.0	3,510	91.0	91.2	90.1	84.7

VFD Data Enter Full Load VFD Efficiency: **96.0** %



Pump Sequencing

Enter Desired Max. Flow per Pump **240** GPM

Variable Speed System Type **1**

Enter "1" if all pumps are variable speed
 Enter "2" if only 1 pump is variable speed (additional or "lag" pumps are fixed speed).

Variable Speed Pump Comparison

Option B

Enter Curve Data from Published Curve

(1 to 3 equal size pumps)

Enter Pump Description: **SS Pump B (B&G model 2AC)**

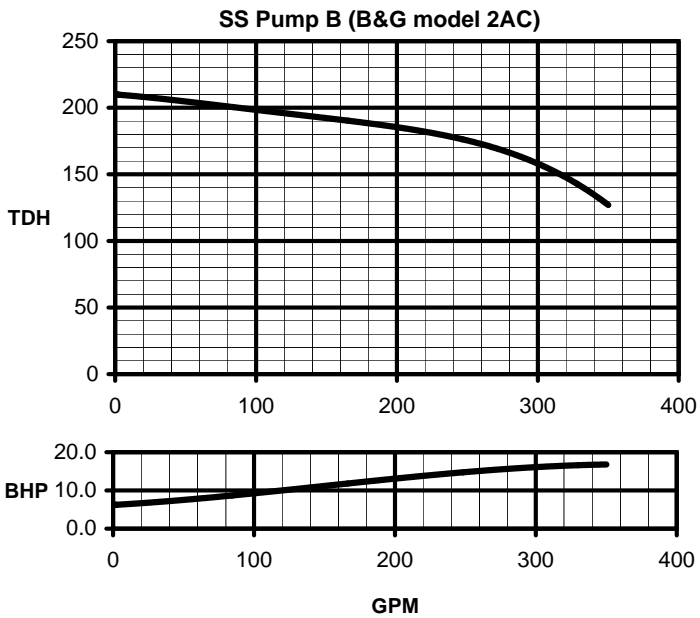
Enter Head at zero flow		210	FEET		
Enter End of curve pump performance:	350 GPM at	127	FEET at	67.0	%
Enter Head and Pump Efficiency at	88 GPM:	200	FEET	49.5	%
Enter Head and Pump Efficiency at	175 GPM:	189	FEET	70.0	%
Enter Head and Pump Efficiency at	263 GPM:	172	FEET	74.5	%

Enter Impeller Diameter for curve data above (if applicable): **7.000** in.
 Enter Impeller Trim (if applicable): in.

Motor Information

HP	Nominal RPM	Eff [%] @ 100%	Eff [%] @ 75%	Eff [%] @ 50%	Eff [%] @ 25%
20.0	3,510	91.0	91.2	90.1	84.7

VFD Data Enter Full Load VFD Efficiency: **96.0** %



Pump Sequencing

Enter Desired Max. Flow per Pump **240** GPM

Variable Speed System Type **1**

Enter "1" if all pumps are variable speed
 Enter "2" if only 1 pump is variable speed (additional or "lag" pumps are fixed speed).

Variable Speed Pump Comparison

Part 3: Summary and Results

Enter Flow Profile - 5 Duty Points

Flow (GPM)	Required TDH, feet	Hours per Day	Hours per Yr
40.0	170	8.0	2,920
80.0	170	8.0	2,920
180.0	170	6.0	2,190
250.0	170	1.0	365
350.0	170	1.0	365
		24	8,760

Application Type: Domestic Water - Small Hospital

Enter Annual Operating Days: 365

Enter Electricity Cost [\$/kWh] 0.100

Water usage: 57,816,000 gal./year
158,400 gal./day

Option A Results

Pump Type(s) **SS Pump A (Armstrong 3x1.5x8 4280 series)**

Flow			Speed, RPM			BHP			Efficiency [%]			Input kW	Annual kWh
Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3		
40.0	0.0	0.0	2,983	0	0	5.0	0.0	0.0	34.6	0.0	0.0	4.5	13,282
80.0	0.0	0.0	2,999	0	0	6.4	0.0	0.0	53.6	0.0	0.0	5.5	16,136
180.0	0.0	0.0	3,173	0	0	11.4	0.0	0.0	67.8	0.0	0.0	9.7	21,238
125.0	125.0	0.0	3,051	3,051	0	8.4	8.4	0.0	63.6	63.6	0.0	14.5	5,307
175.0	175.0	0.0	3,159	3,159	0	11.1	11.1	0.0	67.7	67.7	0.0	18.9	6,896
Total													62,860

Option B Results

Pump Type(s) **SS Pump B (B&G model 2AC)**

Flow			Speed, RPM			BHP			Efficiency [%]			Input kW	Annual kWh
Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3	Pump 1	Pump 2	Pump 3		
40.0	0.0	0.0	3,193	0	0	5.7	0.0	0.0	29.9	0.0	0.0	4.9	14,454
80.0	0.0	0.0	3,235	0	0	7.0	0.0	0.0	49.2	0.0	0.0	6.0	17,566
180.0	0.0	0.0	3,346	0	0	10.8	0.0	0.0	71.6	0.0	0.0	9.2	20,173
125.0	125.0	0.0	3,284	3,284	0	8.5	8.5	0.0	63.0	63.0	0.0	14.7	5,373
175.0	175.0	0.0	3,340	3,340	0	10.6	10.6	0.0	71.0	71.0	0.0	18.0	6,574
Total													64,138

Operating Cost Summary

Option A Annual Operating Cost is	\$ 6,286
Option B Annual Operating Cost is	\$ 6,414
Annual Savings with Option A	\$ 128

Increase in operating costs for Option B **2.0%**

Option A

Average Pumping Efficiency: 51.8 %
Specific Energy: 1.09 kWh/1000 gal

Option B

Average Pumping Efficiency: 49.9 %
Specific Energy: 1.11 kWh/1000 gal

Application Notes