



SmartFlo™ System Sizing Pocket Guide

Curves and sizing information for all SmartFlo systems

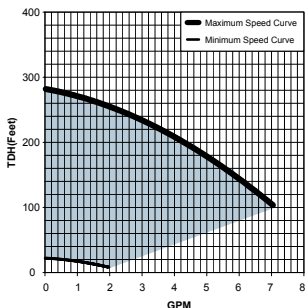
SQE Curves - 3,000 rpm to 10,700 rpm

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SQE SmartFlo™ System Curves



SQE

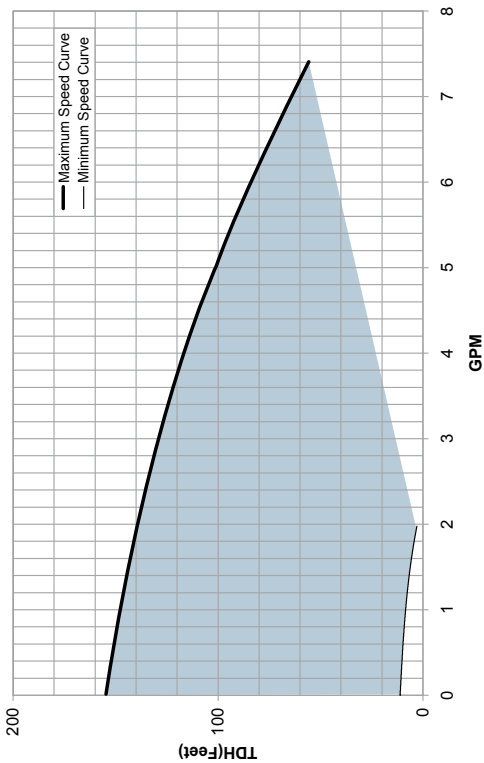
Pressure
Tank (2 gal.)

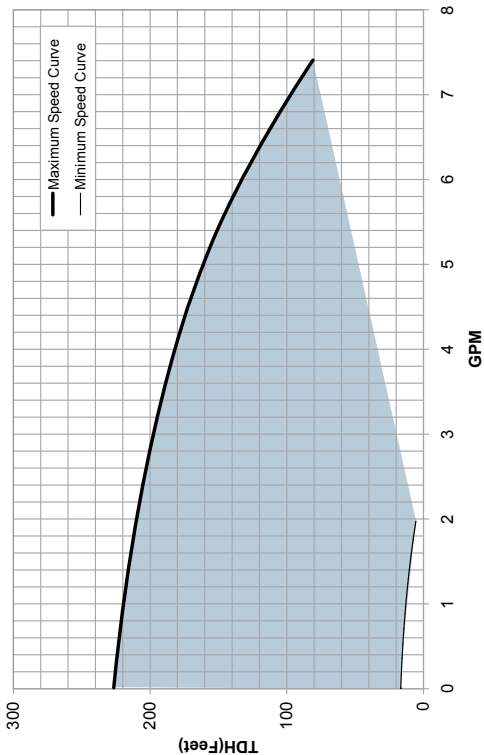


CU 301

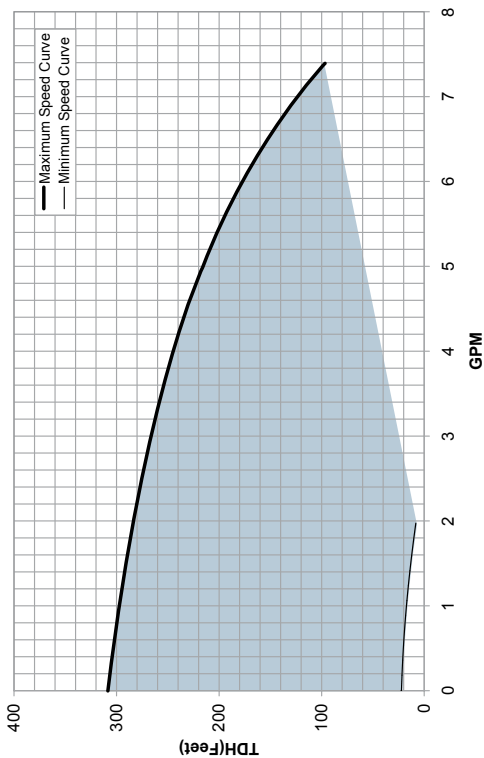


5SQE

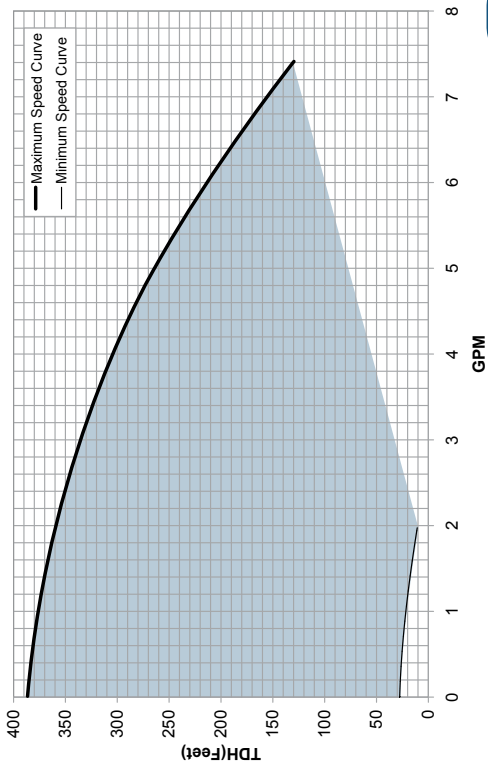




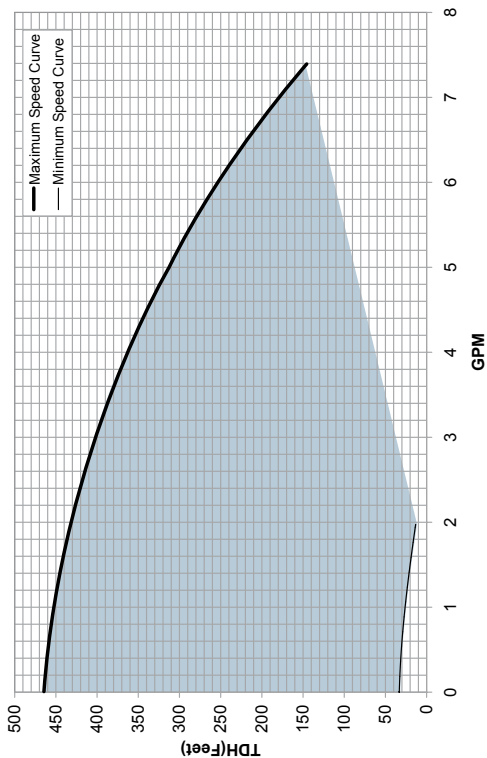
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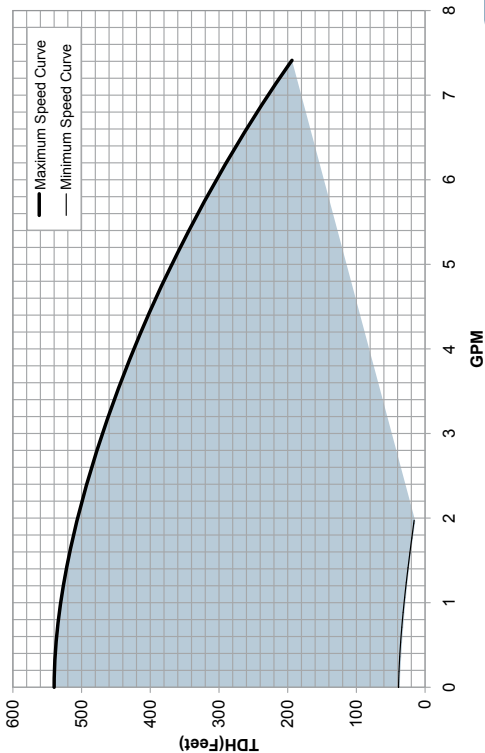
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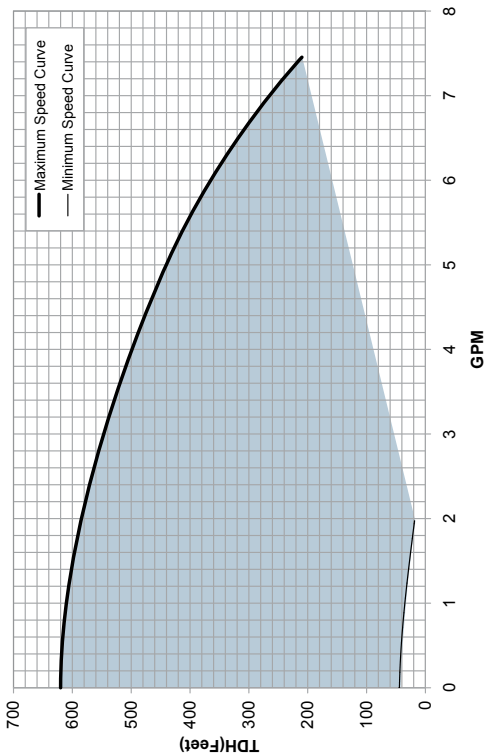
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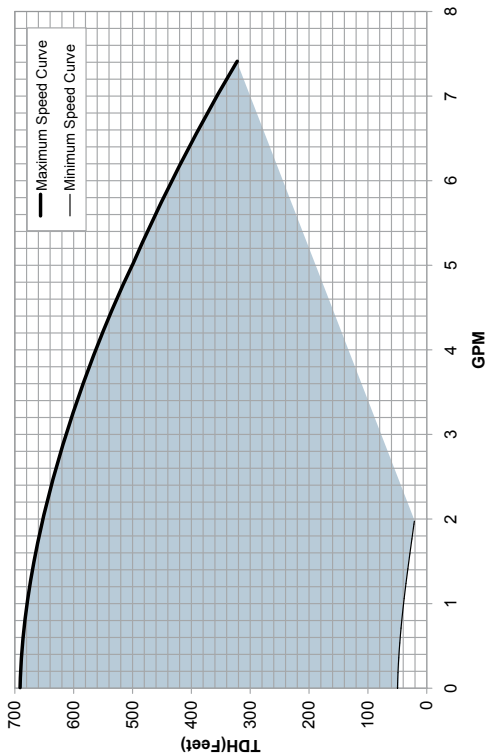
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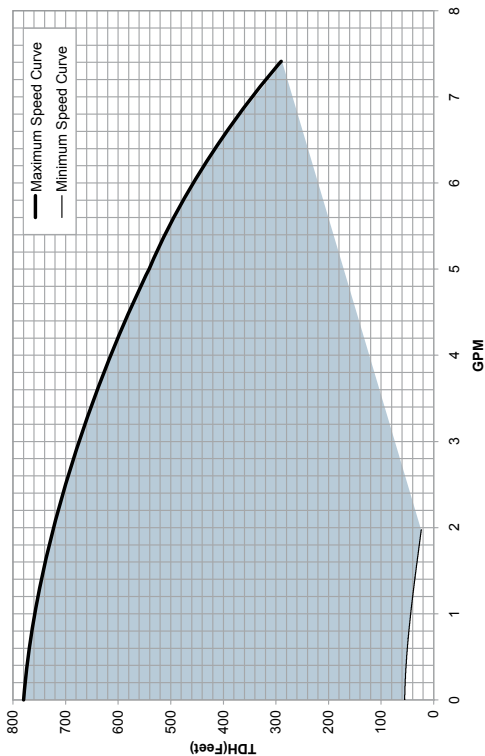
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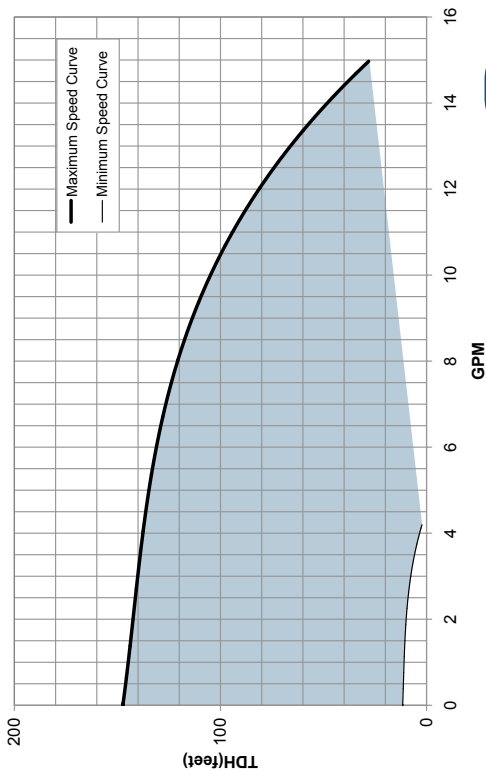
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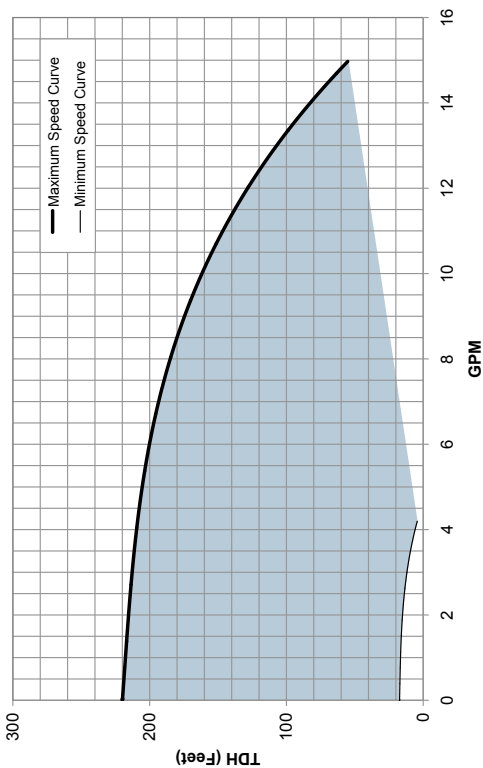
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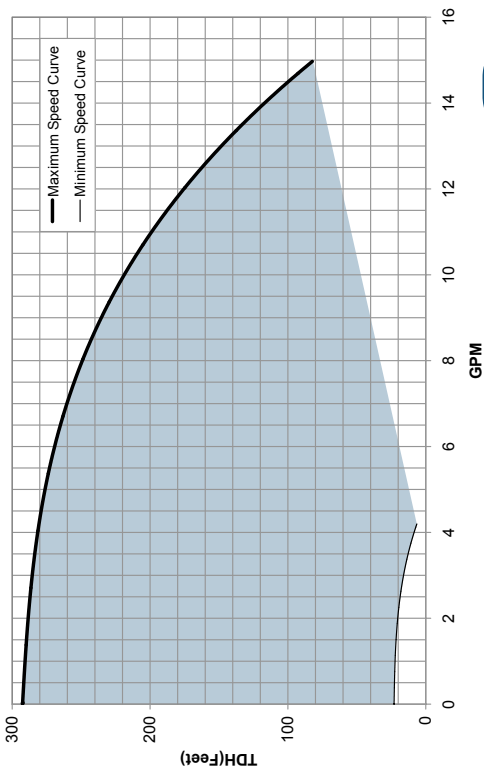
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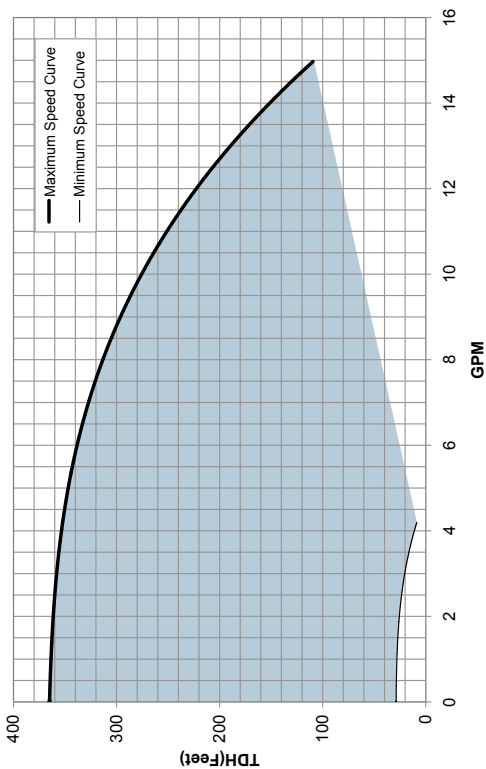
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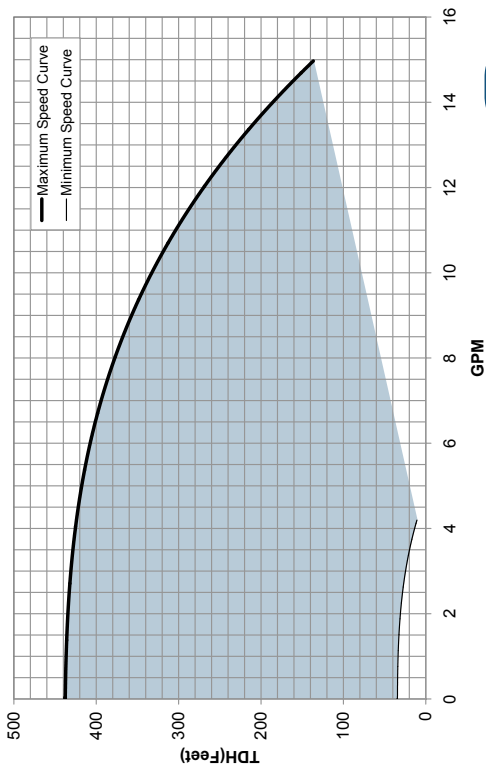
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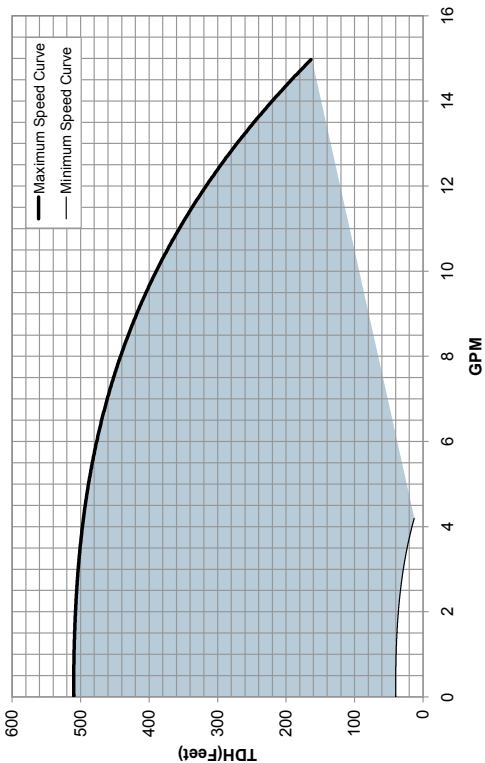
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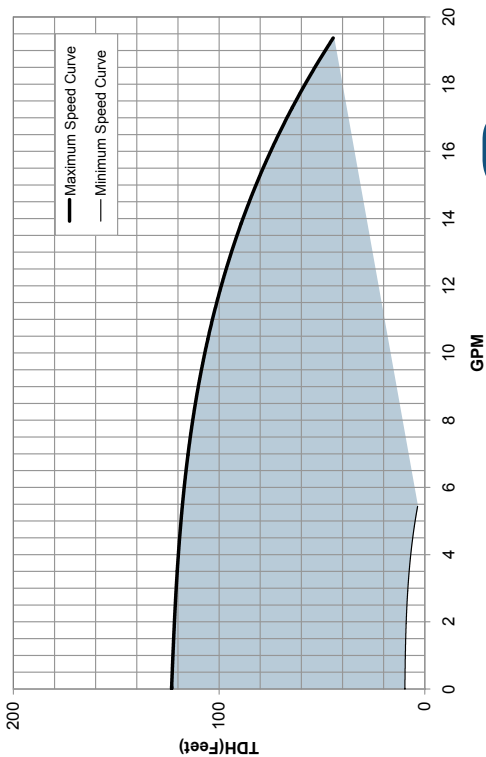


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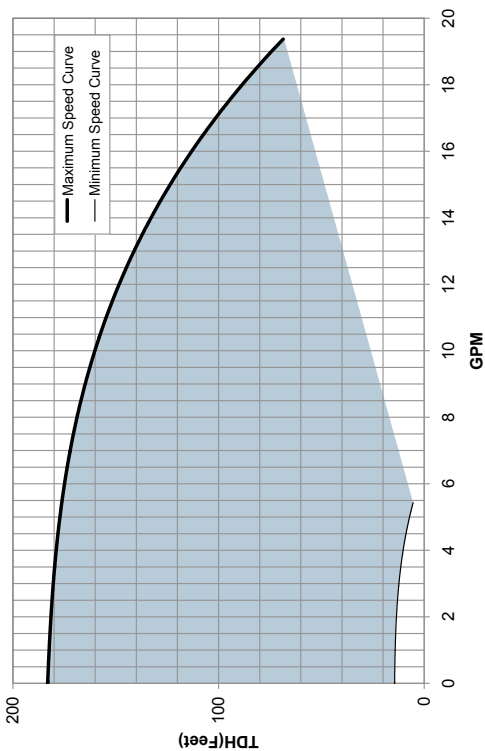
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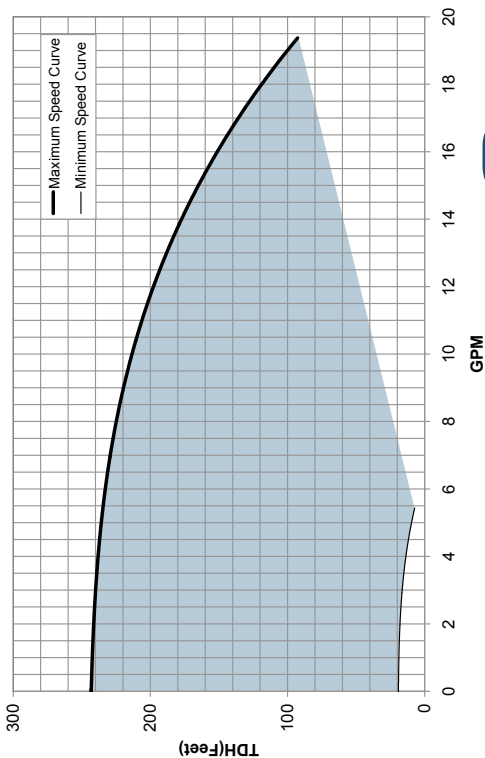




15SQE

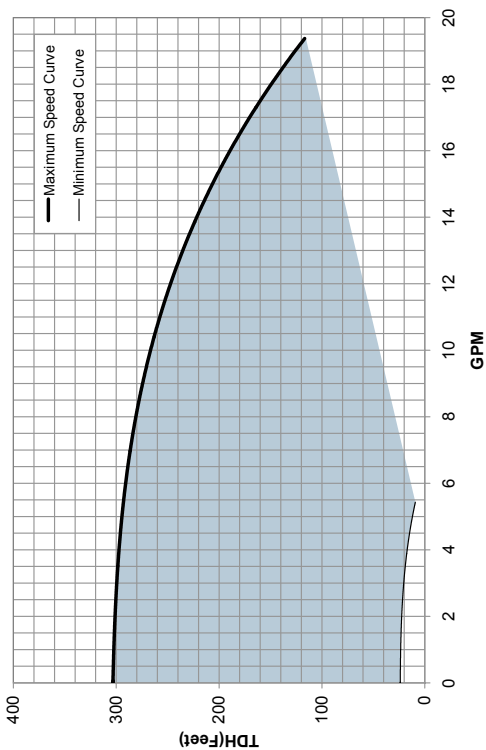
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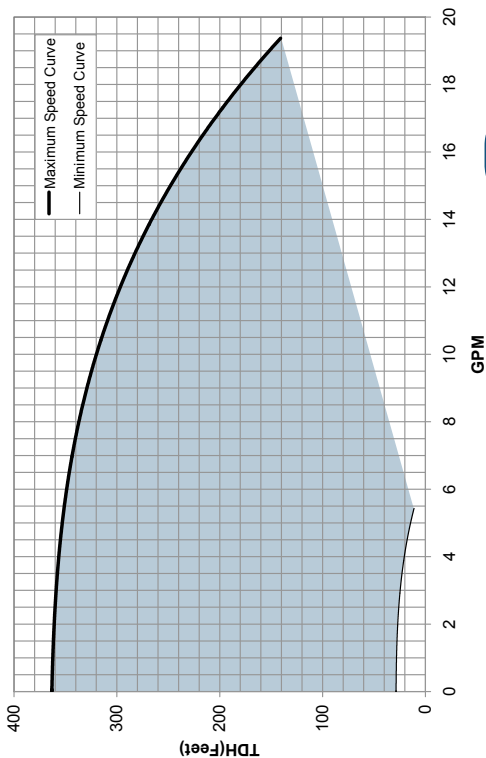




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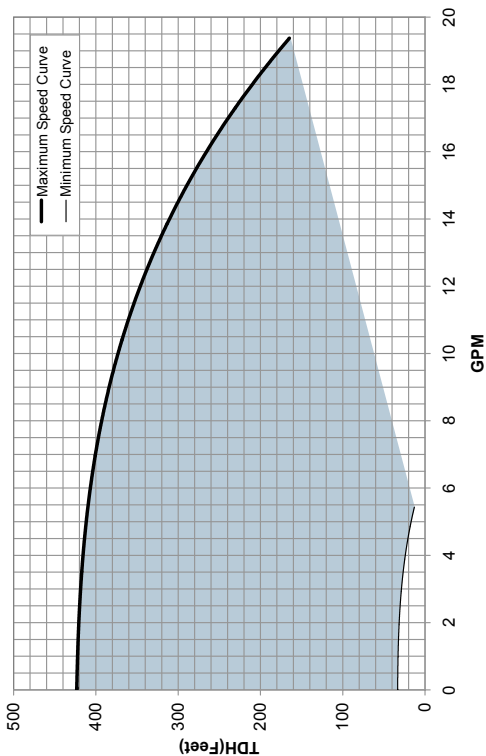
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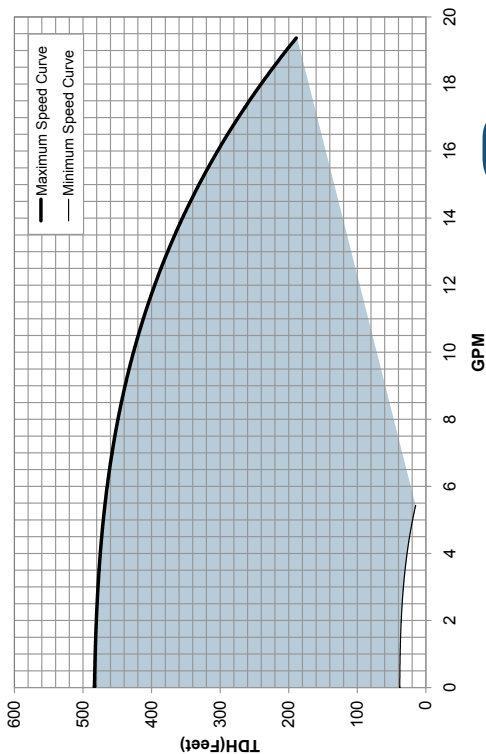




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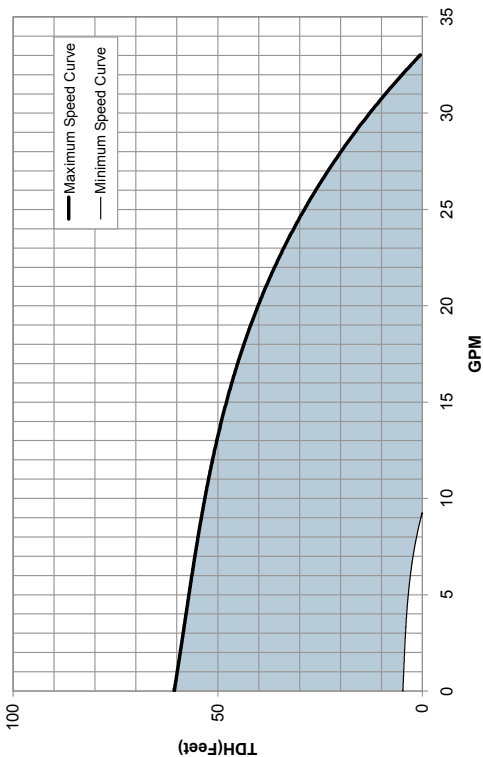
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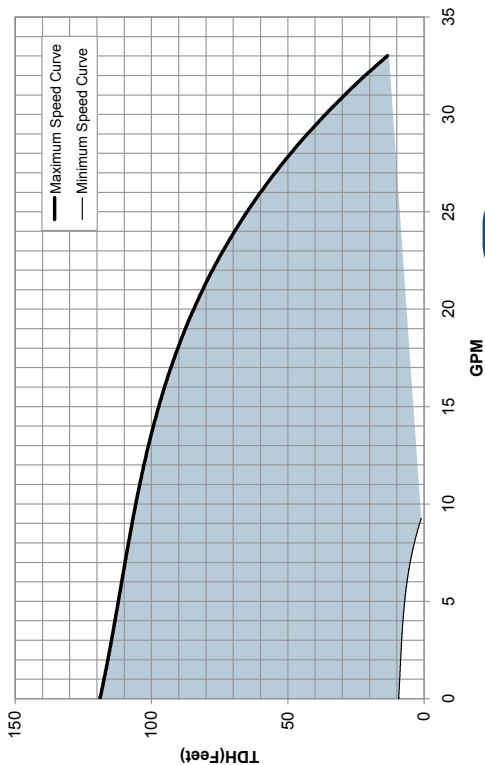




15SQE

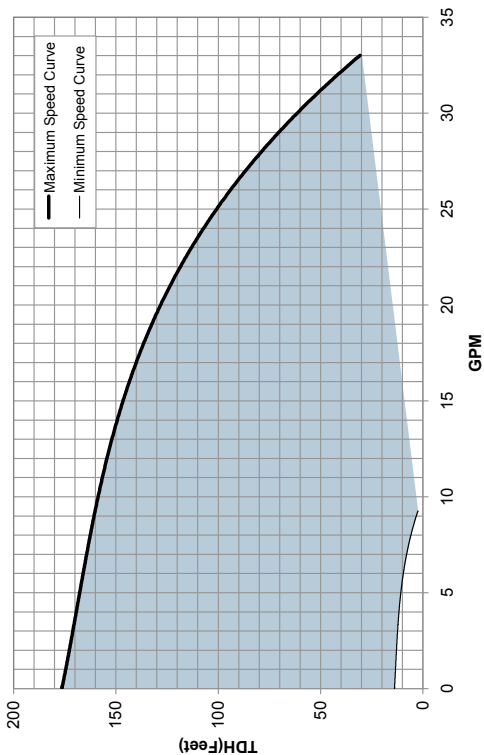
22SQE

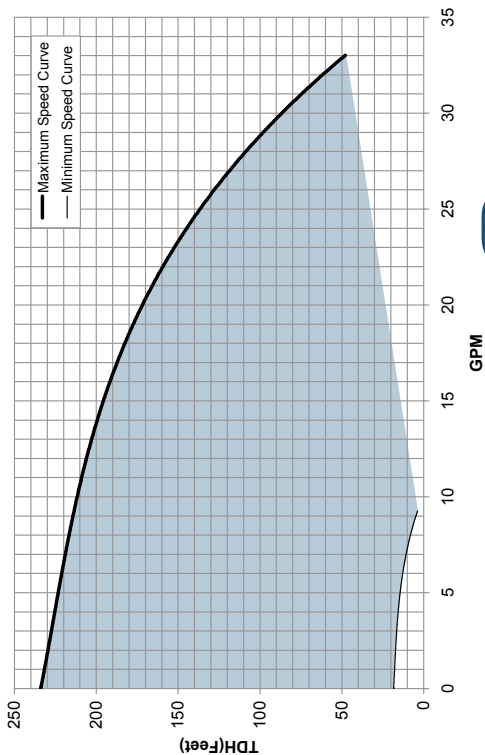




22SQE

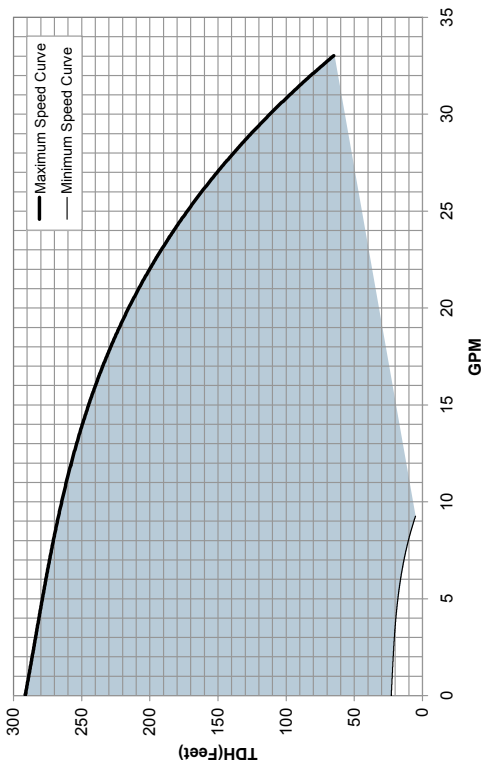
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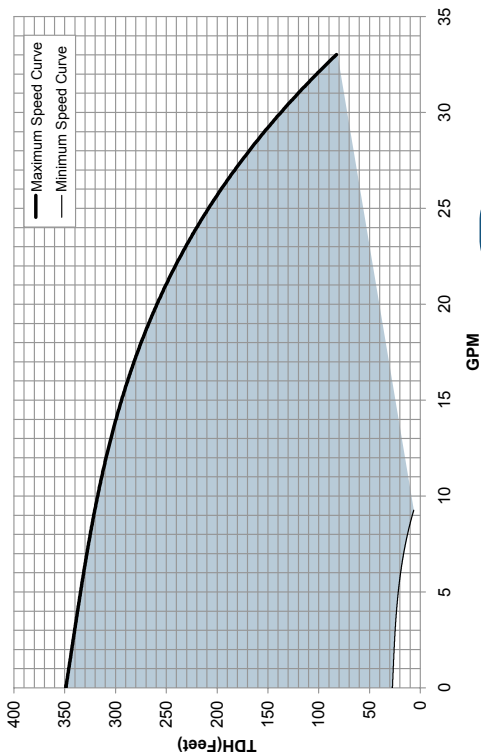




22SQE

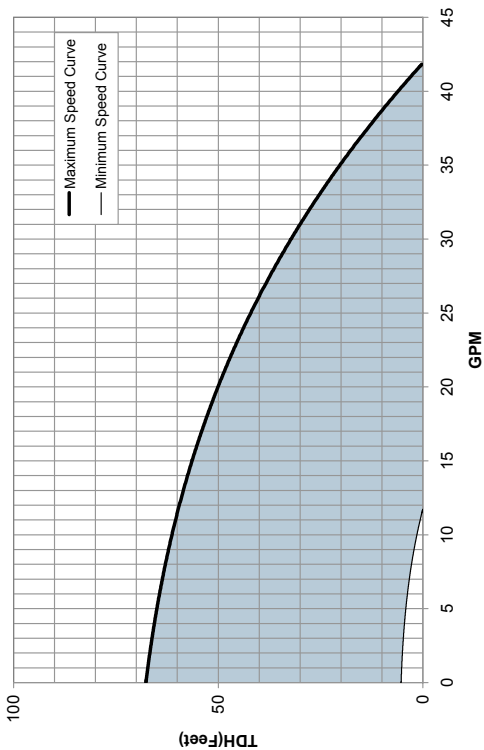
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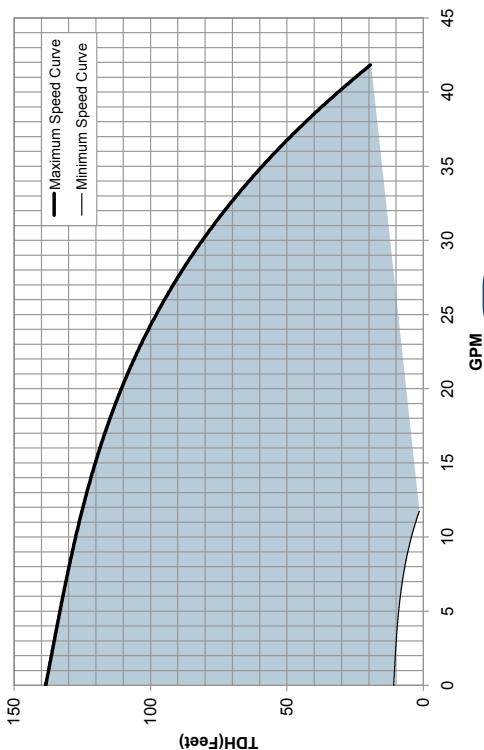




22SQE

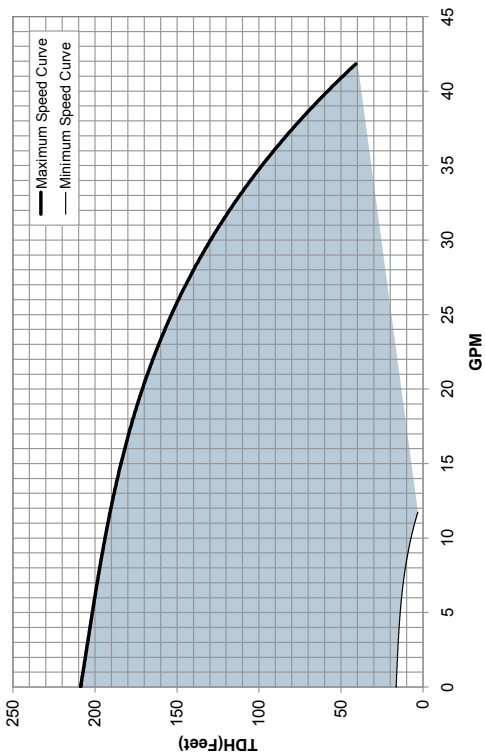
30SQE





30SQE

30SQE



SQE SmartFlo™ System Sizing



Follow these 2 steps.

STEP 1

Calculate maximum head requirements at rated flow conditions:

H_{max} (required) = dynamic head + system pressure (in feet) + friction loss + above grade elevation.

STEP 2

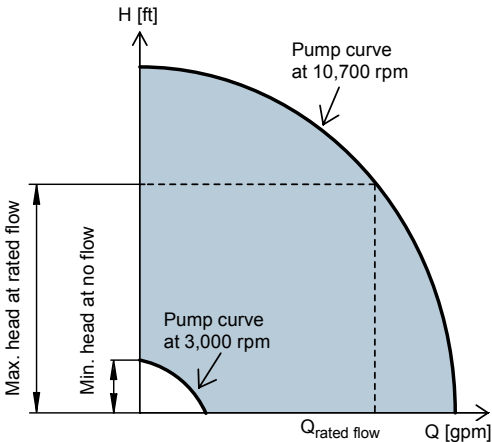
Select pump from the chart on the following page:

- Choose model family based on desired flow rate i.e. 15SQE for a flow rate of 15 gpm.

1

Continues on next page ➤

- ▶ Select the first model with a value in Column 2 that is greater than the Hmax calculated in Step 1.
- ▶ For example: the choice for a 22 gpm model with an Hmax of 140' would be the 22SQE-160. Double check your selection in the performance curve found in the front of this book.

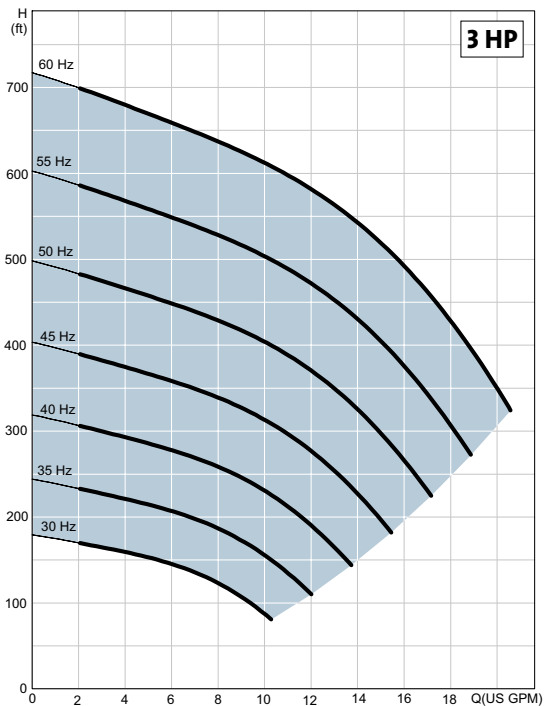


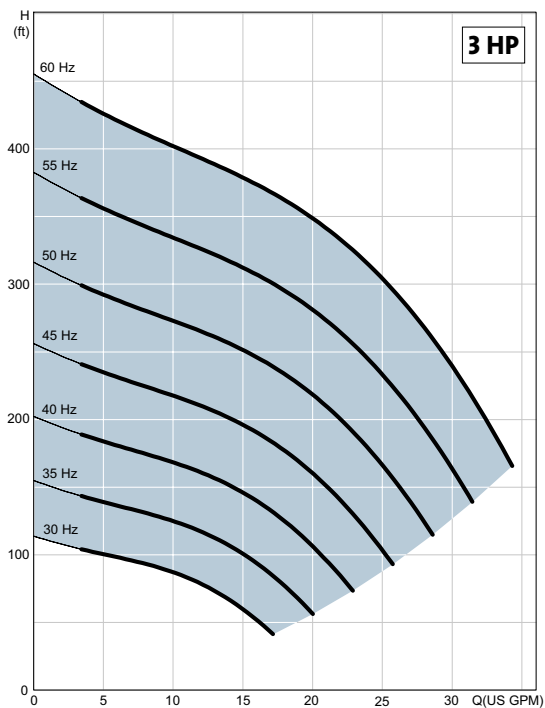
TM01 8547 0400

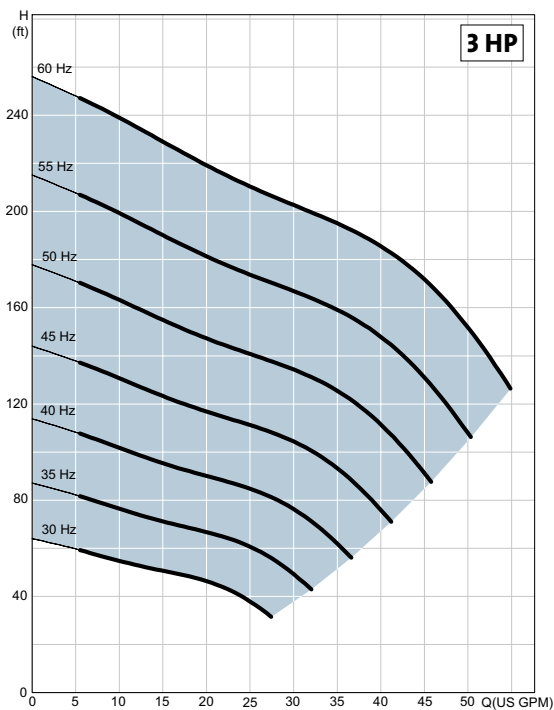
Col. 1

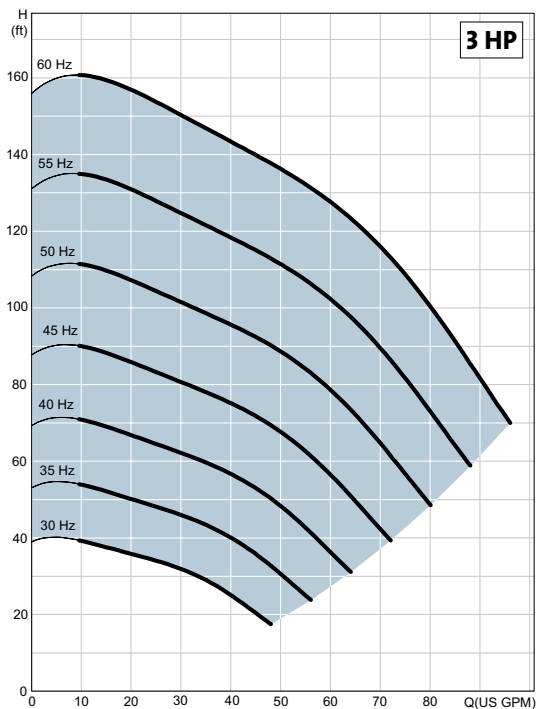
Col. 2

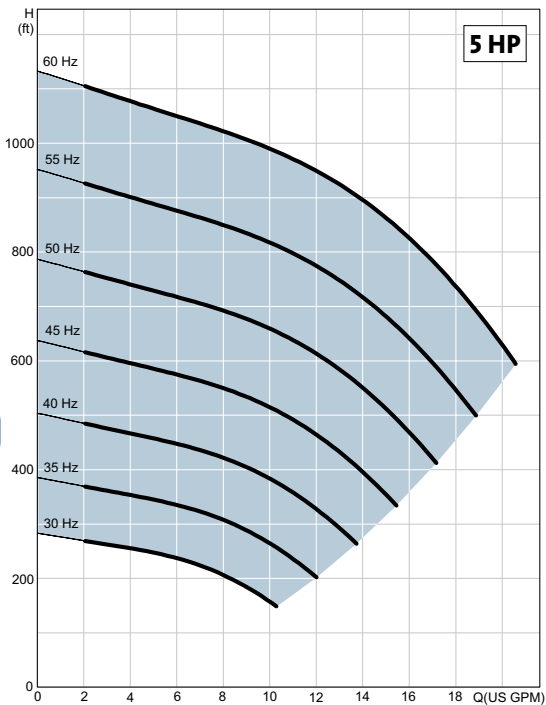
System Sizing Matrix		
Pump Type Model B	Shutoff Head (0 GPM) @ 3000 RPM Min. Speed	Head @ Rated GPM @ 10700 RPM Max. Speed
	TDH(Feet)	TDH(Feet)
5SQE-90	12	104
5SQE-140	18	161
5SQE-180	24	218
5SQE-230	31	275
5SQE-270	37	332
5SQE-320	43	389
5SQE-360	49	446
5SQE-410	55	503
5SQE-450	61	560
10SQE-110	12	102
10SQE-160	17	158
10SQE-200	23	214
10SQE-240	29	270
10SQE-290	34	326
10SQE-330	40	382
15SQE-70	10	80
15SQE-110	14	121
15SQE-150	19	161
15SQE-180	24	202
15SQE-220	29	242
15SQE-250	33	283
15SQE-290	38	323
22SQE-40	5	35
22SQE-80	9	75
22SQE-120	14	115
22SQE-160	18	155
22SQE-190	23	195
22SQE-220	27	235
30SQE-40	5	31
30SQE-90	11	78
30SQE-130	16	125

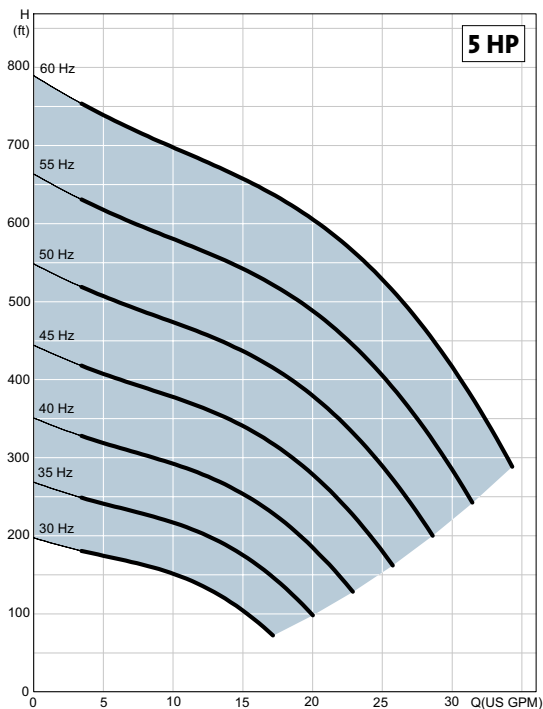


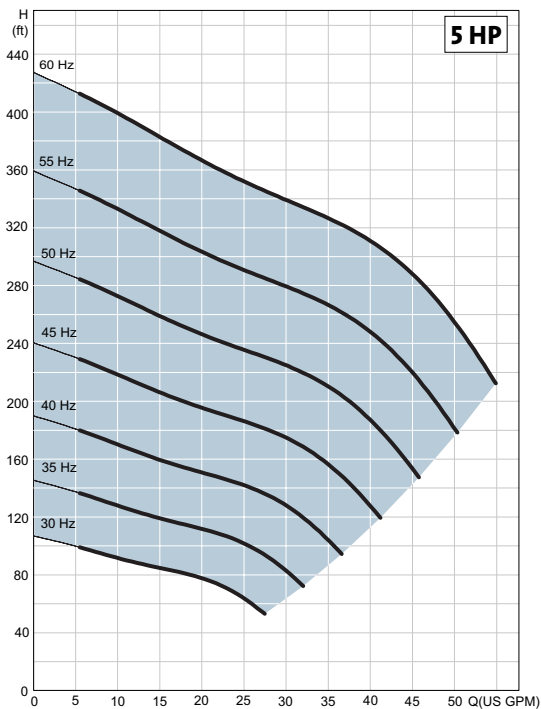
3 HP

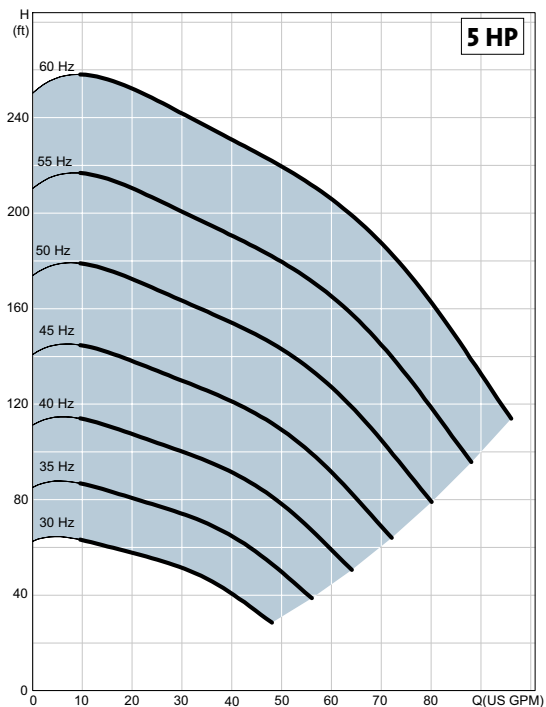












CU321 SmartFlo™ System Sizing



Follow these 2 steps.

STEP 1

Calculate maximum head requirements at rated flow conditions:

2

H_{max} = dynamic head + system psi (feet) + friction loss + above grade elevation.

		Dynamic head
+		System psi (feet)
+		Friction Loss
+		Above grade elevation
=		H_{max}

STEP 2

Select pump from the chart below as follows:

- Choose model family based on desired flow rate. i.e. 40S for a flow rate of 40 gpm.
- Select the first model with a value in Column 2 that is greater than the Hmax calculated in Step 1.
- For example: the choice for a 40 gpm model with an Hmax of 150 would be the 40S30-9.

	Col. 1	Col. 2
System Sizing Matrix		
Pump Type	Shutoff Head (0 GPM) @ 1500 RPM Min. Speed	Head @ Rated GPM @ 3600 RPM Max. Speed
3 HP	TDH(Feet)	TDH(Feet)
16S30-24	128	490
25S30-15	80	305
40S30-9	45	185
75S30-5	30	105
5 HP		
16S50-38	200	825
25S50-26	105	530
40S50-15	75	310
75S50-8	45	175

2

**IMPORTANT NOTE: MUST BE USED WITH
GRUNDFOS 3 PHASE, 230V MOTORS**

PUMP TYPE	HP	VOLTAGE	FULL LOAD AMPS	
			230V	115V
5SQE05-90	1/2	230V/115V	2.1	4.2
5SQE05-140	1/2	230V/115V	2.9	6.0
5SQE05-180	1/2	230V/115V	3.7	7.7
5SQE07-230	3/4	230V	4.6	
5SQE07-270	3/4	230V	5.3	
5SQE07-320	3/4	230V	6.2	
5SQE10-360	1	230V	7.2	
5SQE10-410	1	230V	8.1	
5SQE15-450	1 1/2	230V	9.2	
10SQE05-110	1/2	230V/115V	2.9	6.1
10SQE05-160	1/2	230V/115V	4.1	8.6
10SQE07-200	3/4	230V	5.3	
10SQE7-240	3/4	230V	6.0	
10SQE10-290	1	230V	7.7	
10SQE15-330	1 1/2	230V	8.9	
15SQE05-70	1/2	230V/115V	2.9	6.0
15SQE05-110	1/2	230V/115V	4.0	8.3
15SQE07-150	3/4	230V	5.1	
15SQE07-180	3/4	230V	6.2	
15SQE10-220	1	230V	7.4	
15SQE10-250	1	230V	8.4	
15SQE15-290	1 1/2	230V	9.7	
22SQE05-40	1/2	230V/115V	1.9	3.9
22SQE05-80	1/2	230V/115V	3.4	7.2
22SQE07-120	3/4	230V	4.9	
22SQE07-160	3/4	230V	6.4	
22SQE10-190	1	230V	7.9	
22SQE15-220	1 1/2	230V	9.5	
30SQE05-40	1/2	230V/115V	2.8	5.7
30SQE07-90	3/4	230V	5.2	
30SQE10-130	1	230V	7.6	

OVERLOAD AMPS		MIN. WELL DIA.	DISCHARGE
230V	115V		
5	11	3"	1" NPT
5	11	3"	1" NPT
5	11	3"	1" NPT
8		3"	1" NPT
8		3"	1" NPT
8		3"	1" NPT
11		3"	1" NPT
11		3"	1" NPT
12		3"	1" NPT
5	11	3"	1 1/4" NPT
8	11	3"	1 1/4" NPT
8		3"	1 1/4" NPT
8		3"	1 1/4" NPT
11		3"	1 1/4" NPT
12		3"	1 1/4" NPT
5	11	3"	1 1/4" NPT
5	11	3"	1 1/4" NPT
8		3"	1 1/4" NPT
8		3"	1 1/4" NPT
11		3"	1 1/4" NPT
11		3"	1 1/4" NPT
12		3"	1 1/4" NPT
5	11	3"	1 1/2" NPT
5	11	3"	1 1/2" NPT
8		3"	1 1/2" NPT
8		3"	1 1/2" NPT
11		3"	1 1/2" NPT
12		3"	1 1/2" NPT
5	11	3"	1 1/2" NPT
8		3"	1 1/2" NPT
11		3"	1 1/2" NPT

Cable length selection tables

The following table (Fig. 7) lists the recommended copper cable sizes and various cable lengths for SQE motors. Proper wire size will ensure that adequate voltage will be supplied to the motor.

To assure adequate voltage, the maximum cable lengths are calculated for when the motor is running at maximum nameplate amps. Cable sizes larger than specified may always be used and will reduce power loss.

The use of cables smaller than the recommended sizes will void the warranty. Smaller cable sizes may cause under-voltage alarms.

230 VAC AMPS CHART FOR CU321

PUMP TYPE	HP	VAC	FULL LOAD CURRENT	DISCHARGE
16S30-24	3	1X230V	12	1-1/4" NPT
25S30-15	3	1X230V	12	1-1/2" NPT
40S30-9	3	1X230V	12	2" NPT
75S30-5	3	1X230V	12	2" NPT
16S50-38	5	1X230V	21	1-1/4" NPT
25S50-26	5	1X230V	21	1-1/2" NPT
40S50-15	5	1X230V	21	2" NPT
75S50-8	5	1X230V	21	2" NPT
16S50-38	5	3X230V	19.2	1-1/4" NPT
25S50-26	5	3X230V	19.2	1-1/2" NPT
40S50-15	5	3X230V	19.2	2" NPT
75S50-8	5	3X230V	19.2	2" NPT

SQ/SQE ONLY

Fig. 7

Motor Rating		Copper Wire Size (AWG)									
		AMPS	14	12	10	8	6	4	2		
Volts	HP										
115	1/2	12	140	220	360	550	880	1390	2260		
230	1/2	5.2	640	1000	1660	2250	4060				
230	3/4	8.4	400	620	1030	1580	2510	3970			
230	1	11.2	300	460	770	1190	1890	2980	4850		
230	1 1/2	12	280	430	720	1110	1760	2780	4530		

Cable length is in feet

Note: The calculations in the table are based on supply of 115V or 230V

Max recommended cable length between the CU300/301 and SQE = 200m (656 ft)

Friction Loss Table - SCH 40 Steel Pipe

(Friction Loss in Feet of Head Per 100 Feet of Pipe)

GPM	GPH	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
		ID 0.622"	ID 0.824"	ID 1.049"	ID 1.380"	ID 1.610"	ID 2.067"	ID 2.469"	ID 3.068"	ID 4.026"
2	120	4.8								
3	180	10	2.5							
4	240	17.1	4.2							
5	300	25.8	6.3	1.9						
6	360	36.5	8.9	2.7						
7	420	48.7	11.8	3.6						
8	480	62.7	15	4.5						
9	540	78.3	18.8	5.7						
10	600	95.9	23	6.9	1.8					
12	720		32.6	9.6	2.5	1.2				
14	840		43.5	12.8	3.3	1.5				
16	960		56.3	16.5	4.2	2				
20	1,200		86.1	25.1	6.3	2.9				
25	1,500			38.7	9.6	4.5	1.3			
30	1,800			54.6	13.6	6.3	1.8			
35	2,100			73.3	18.2	8.4	2.4			
40	2,400			95	23.5	10.8	3.1	1.3		
45	2,700				29.4	13.5	3.9	1.6		
50	3,000				36	16.4	4.7	1.9		
60	3,600				51	23.2	6.6	2.7		
70	4,200				68.8	31.3	8.9	3.6	1.2	
80	4,800				89.2	40.5	11.4	4.6	1.6	
90	5,400					51	14.2	5.8	2	
100	6,000					62.2	17.4	7.1	2.4	
120	7,200						24.7	10.1	3.4	
140	8,400						33.2	13.5	4.5	1.2
160	9,600						43	17.5	5.8	1.5
200	12,000						66.3	27	8.9	2.3
260	15,600							45	14.8	3.7
300	18,000							59.6	19.5	4.9

3

Friction Loss Table - Valves and Fittings

(Friction Loss in Equivalent number of Feet of Straight Pipe)

TYPE OF FITTING AND APPLICATION	PIPE AND FITTING	NOMINAL SIZE OF FITTING AND PIPE						
		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"
EQUIVALENT LENGTH OF PIPE(IN FEET)								
Insert Coupling	Plastic	3	3	3	3	3	3	3
Threaded Adapter (Plastic to Thread)	Plastic	3	3	3	3	3	3	3
90° Standard Elbow	Steel	2	2	3	4	4	5	6
	Plastic	2	2	3	4	4	5	6
Standard Tee (Flow Through Run)	Steel	1	2	2	3	3	4	4
	Plastic	1	2	2	3	3	4	4
Standard Tee (Flow Through Side)	Steel	4	5	6	7	8	11	13
	Plastic	4	5	6	7	8	11	13
Gate Valve ¹	Steel	1	1	1	1	2	2	2
Swing Check Valve ¹	Steel	5	7	9	12	13	17	21

Friction Loss Table - SCH 40 PVC

(Friction Loss in Feet of Head Per 100 Feet of Pipe)

GPM	GPH	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
		ID	ID	ID	ID	ID	ID	ID	ID	ID
		0.622"	0.824"	1.049"	1.380"	1.610"	2.067"	2.469"	3.068"	4.026"
2	120	4.1								
3	180	8.7	2.2							
4	240	14.8	3.7							
5	300	22.2	5.7	1.8						
6	360	31.2	8	2.5						
7	420	41.5	10.6	3.3						
8	480	53	13.5	4.2						
9	540	66	16.8	5.2						
10	600	80.5	20.4	6.3	1.7					
12	720		28.6	8.9	2.3	1.1				
14	840		38	11.8	3.1	1.4				
16	960		48.6	15.1	4	1.9				
20	1,200		60.5	22.8	6	2.8				
25	1,500			38.7	9.1	4.3	1.3			
30	1,800				12.7	6	1.8			
35	2,100				16.9	8	2.4			
40	2,400				21.6	10.2	3	1.1		
45	2,700				28	12.5	3.8	1.4		
50	3,000					15.4	4.6	1.7		
60	3,600					21.6	6.4	2.3		
70	4,200					28.7	8.5	3	1.2	
80	4,800					36.8	10.9	3.8	1.4	
90	5,400					45.7	13.6	4.8	1.8	
100	6,000					56.6	16.5	5.7	2.2	
120	7,200						23.1	8	3	
140	8,400						30.6	10.5	4	1.1
160	9,600						39.3	13.4	5	1.4
200	12,000						66.3	20.1	7.6	2.1
260	15,600							32.4	12.2	3.4
300	18,000							42.1	15.8	4.4

NOTES:

Based on schedule 40 steel and plastic fittings.

Figures given are friction losses in terms of Equivalent Lengths of straight pipe.

1 Friction loss figures are for screwed valves and are based on equivalent lengths of steel pipe.

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