Selecting a submersible pump

The following guideline was made for choosing a submersible well pump. It will help you determine what work the submersible pump must perform to accomplish the requirements of your application. Horsepower is determined by the work the pump must perform at a given GPM for the requirement. Some applications may have other considerations which may not be included in this guideline. Your use of this guideline is made at your own risk and Worldwide Power and Pump Services, Inc. can and will not be held responsible for its use.

To begin, we will need to collect the following information. This information should be stored in a safe place for future needs.

(1) The maximum pressure required for the application.
(2) The depth in feet the pump will hang from the earth's surface.
(3) The standing water level in feet from the earth's surface (static water level)
NOTE: Water being pumped from a well is measured from the water's surface (static water level) because it is being lifted against gravity not the place where the pump is placed. Water pumped under water is virtually weightless and has only friction properties for the water flowing through the pipe for that distance.
(4) The recovery rate in gallons per minute the well replenishes itself (refresh rate).
(5) The total distance in vertical lift in feet from the water's surface to the highest point of discharge.
(6) The gallon per minute required for the application.
(7) The pipes internal diameter in inches and the total length in feet from the pump to the farthest point of discharge.

When all the information has been gathered we can start the determination of the pump required.

(Note: not knowing required information will lead to improper selection of the pump required!)

We will use an example of domestic house water usage for a family of 3 at 10GPM @ 50PSI maximum.

Our well is 300' deep, pump will be hung at 260' on 1" ID PVC pipe, the wells static water level is 30', the well has a high refresh rate of 20GPM , the house is up a small hill vertically 50' and 1" ID pipe has already been installed totaling 500 feet from well head to the house.

Example Information:

(1) 50PSI = 115 feet of head. (we convert pressure to vertical lift in feet (1 PSI = 2.31 feet of vertical lift to make our calculation of total dynamic head (TDH) required in our application)
(2) 260 feet(distance to pump from earth's surface)
(3) 30 feet(static water level to be used later for total vertical lifting consideration)
(4) Verified OK (because the water required in GPM is lower than the wells refresh rate GPM.

(5) 80 vertical lift in feet = 30 feet lift (static water level) + 50 feet lift (vertical lift up hill to house).
(6) 10GPM required
(7) 760 feet total distance water travels through pipe = 260 feet (from earth's surface to pump) + 500 feet (distance from well head to house) using 1" ID PVC pipe (determine friction using friction chart furnished below adding total distance water must flow through pipe). In this example our friction is 6.3 feet of vertical lift per 100 feet of pipe X distance in hundreds or 6.3 X 7.6 = 48 feet additional lift (friction of water pumping through pipe at 10GPM).

We must determine (total dynamic head -TDH) by adding the total feet required: (1) 50PSI or 115', + (5) total vertical lift or 80', + (7) pipe friction or 48' and (4) verify refresh rate of well vs. pumping requirement.

(1) 115'

(5) 80'

(7) 48'

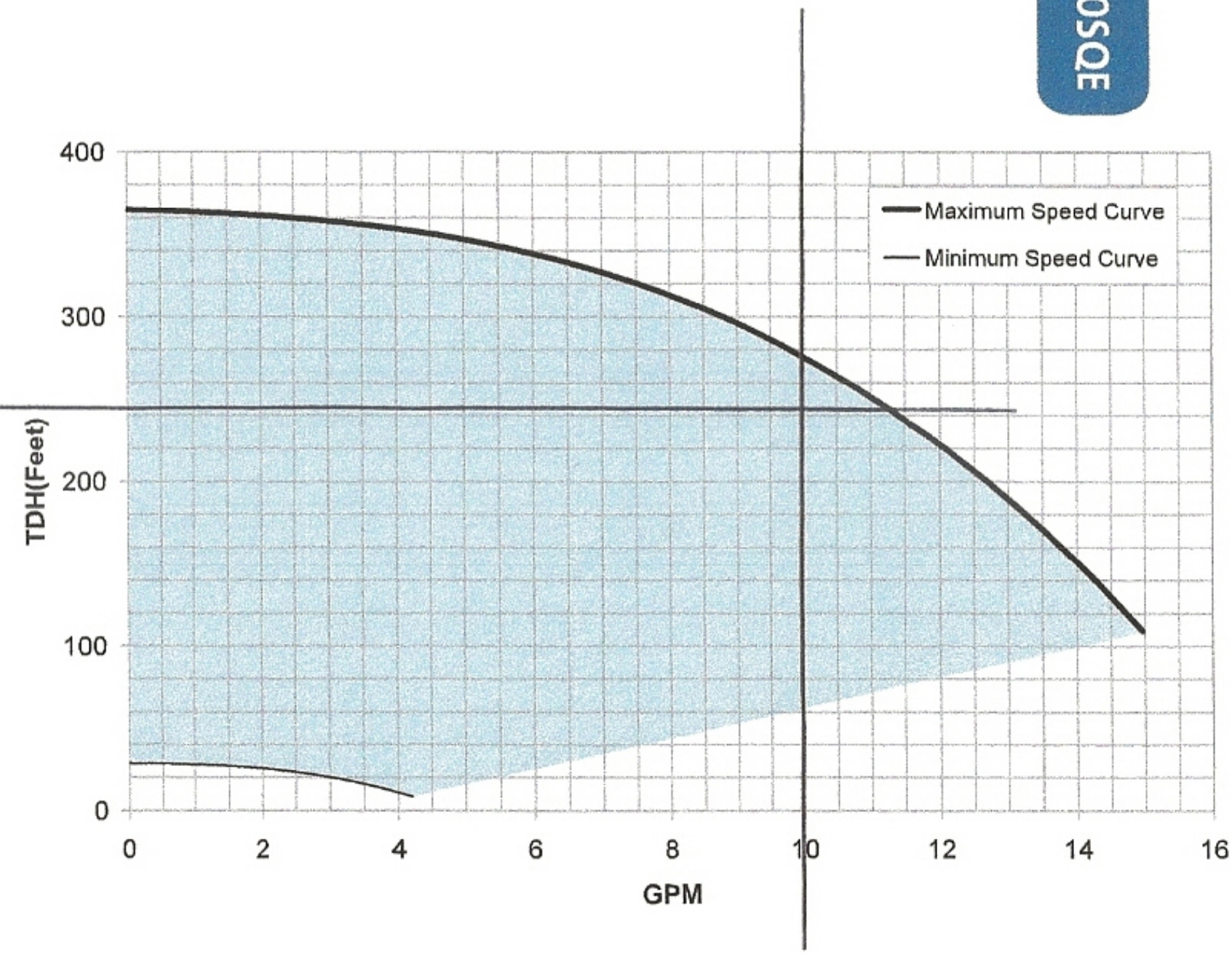
243' or TDH required

When using a graph you need to draw a line left to right at required TDH and from the bottom to top in GPM required. The intersection of those lines determines the pump required. Choosing the pump curve right above that line generally is the best choice for the application.

If your still unsure, please gather all information 1-7 and call us at 1-866-960-9621 for experienced help choosing the correct pump for your application.

See our example selection for a Grundfos SQ or SQE pump in graph on next page.

10SQE



10SQE07-240

SQE Performance Curve

Friction Loss Table - SCH 40 PVC

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

GPM	GPH	1/2" ID 0.622"	3/4" ID 0.824"	1" ID 1.049"	1 1/4" ID 1.380"	1 1/2" ID 1.610"	2" ID 2.067"	2 1/2" ID 2.469"	3" ID 3.068"	4" ID 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.