

TABLE 1: MAXIMUM PUMP FLOW for 3500 RPM PUMPS:

| HP | GPM AT 60 HF (25 PSI) | GPM AT 80 HF (34 PSI) | GPM AT 100 HF (40 PSI) | GPM AT 120 HF (50 PSI) |
|-----|-----------------------|-----------------------|------------------------|------------------------|
| 1.5 | 40 GPM | 20 GPM | | |
| 2 | 70 GPM | 25 GPM | | |
| 3 | 100 GPM | 80 GPM | 40 GPM | |
| 5 | 225 GPM | 160 GPM | 120 GPM | 120 GPM |
| 7.5 | 300 GPM | 200 GPM | 200 GPM | 200 GPM |
| 10 | | 275 GPM | 300 GPM | 200 GPM |
| 15 | | 490 GPM | 425 GPM | 350 GPM |
| 20 | | | 550 GPM | 450 GPM |
| 25 | | | 675 GPM | 600 GPM |

TABLE 2: PUMP FLOW for 1750 RPM PUMPS:

| HP | GPM AT 60 HF (25 PSI) | GPM AT 80 HF (34 PSI) | GPM AT 100 HF (40 PSI) | GPM AT 120 HF (50 PSI) |
|-----|-----------------------|-----------------------|------------------------|------------------------|
| 2 | 80 GPM | | | |
| 3 | 100 GPM | | | |
| 5 | 175 GPM | | | |
| 7.5 | 300 GPM | 200 GPM | | |
| 10 | 500 GPM | 300 GPM | 200 GPM | 150 GPM |
| 15 | 750 GPM | 550 GPM | 300 GPM | 275 GPM |
| 20 | 1100 GPM | 750 GPM | 500 GPM | 400 GPM |
| 25 | | 1000 GPM | 700 GPM | 550 GPM |

TABLE 3: RECOMMENDED MAXIMUM FLOWS THROUGH SCH. 40 STEEL PIPE AT 6' AND 8' PER SECOND VELOCITY WITH PRESSURE DROP:

| | | | | | | | |
|------|---------|----|---------|----|----------|----|---------|
| 1" | 15 gpm | at | 6 psi | to | 24 gpm | at | 14 psi |
| 1 ¼" | 30 gpm | at | 6 psi | to | 38 gpm | at | 9.0 psi |
| 1 ½" | 40 gpm | at | 4 psi | to | 61 gpm | at | 7.0 psi |
| 2" | 60 gpm | at | 3 psi | to | 85 gpm | at | 5.0 psi |
| 2 ½" | 90 gpm | at | 2.5 psi | to | 115 gpm | at | 4.0 psi |
| 3" | 130 gpm | at | 1.5 psi | to | 185 gpm | at | 3.5 psi |
| 4" | 230 gpm | at | 1.3 psi | to | 310 gpm | at | 2.4 psi |
| 6" | 530 gpm | at | 1.0 psi | to | 730 gpm | at | 3.0 psi |
| 8" | 900 gpm | at | 0.6 psi | to | 1250 gpm | at | 1.0 psi |

HOW TO SELECT THE PROPER PUMP PACKAGE:

- 1 – Determine the system flow.
- 2 – Determine the system pressure drop. Do not under estimate the pressure drop, in doubt go higher.
- 3 – Select the pipe diameter for your system flow between 6' to 8' per second flow using table 3.
- 4 – Select the pump to supply that flow at either rpm using table 1 or 2. Do not go higher than gpm at given at HF.

Example: Duplex pump package supplying 100 gpm at 100 HF with a 3500 rpm motor.

The pump would be a 5 hp taken from table 1, column 3. This pump can go to 120 gpm at 100 HF.

The line size would be 3" at 6' per second and 2 ½" at 8' per second. A short pipe run 8' per second would be acceptable, for a long pipe run the 6' per second selection is a better choice, lower system pressure drop.

Our model number for this selection would be DP - 5 x 5 - 3500 with 3" in and out connections.

Please note: Table 3 is a guide only.

Low system pressure can lead to low water flows which can lead to chiller freeze-ups.

More

flow is better.

HOW TO SELECT THE PROPER TANK: Compression or expansion.

We have been advised that the rubber bladder in the expansion tanks will freeze at 25 F during the winter months. As long as the system is not operating (no water or water/glycol flow) the bladder will not be damaged, it will freeze and thaw out in the spring.

For northern climates we are proposing compression tanks (with no bladder) that have no parts that can freeze. If the system is started inadvertently or needs to operate during all or part of the winter months no damage will be done.

HOW TO SELECT THE SIZE OF THE TANK:

The maximum rate expansion of water in a chilled water system is 2% of its volume and either tank selected must take up this volume.

The portion of the tank that fills with expanded water is called the "acceptance volume", with compression tanks this is normally 50% of the tank size, 10 gallon tank will have an acceptance volume of 5 gallons, the maximum system volume would be 250 gallons. If your system volume is greater than this the tank in our example is too small.

With expansion tanks with bladders the acceptance volume can be 90% to 95%, we use 90% to be safe. Using the example above of a 10 gallon tank the acceptance volume is 9 gallons, the maximum system volume would be 450 gallons. If your system volume is greater than this the tank in our example is too small.

Please check system volume we specify in our quote and compare it with your specific system volume.

To add a tank to the duplex pump package add "EXP" for an expansion tank and "COMP" for compression tank after the hp.

Example: DP - 5 x 5 – 3500 - EXP

5 hp 3500 rpm pump package with expansion tank.