Finding the Maximum Flow Rate of an Existing System
(When an accurate flow meter is not installed)

Preparation:
1. Open all valves to their full open position for pool or spa circulation.
2. Remove Eye-ball fittings from Return Inlets (if applicable)
3. Clean Skimmer and Pump Baskets
4. Backwash or Clean Filter

Method 1: Measure using a 5 gallon Bucket and stopwatch
1. If necessary, using known 1 gallon or smaller containers, fill a 5 gallon bucket with exactly 5 gallons of water and mark a line on the inside of the bucket at the water level
2. Turn on pump and operate until it is running with a full prime.
3. Using the backwash valve or waste valve and stopwatch record seconds required to fill the 5 gallon bucket to the line previously established.
4. Divide 60 by the number of seconds established above and multiply the result by 5. This will give you the maximum GPM of the system.
5. Repeat Test several times to verify results.

EXAMPLE: If it takes 10 seconds to fill a 5 gallon bucket,
the GPM flow rate would be:
(60 seconds per minute /10 seconds) x 5 gallons = 30 Gallons per Minute

Method 2: Calculate using pressure and vacuum gage readings (see figure 1)
1. Install a vacuum gage as close to the bottom of the strainer basket as possible
2. Install a pressure gage as close to the pump discharge as possible
NOTE: It may be necessary to use a ½” NPT x Barb fitting with a short section of plastic tubing connected to a gage if gages cannot be screwed into drain holes provided in pump.
3. Multiply Vacuum reading by 1.13 and record reading
4. Multiply Pressure reading by 2.31 and record reading
5. Add results of step 3 and 4 together to get the approximate Total Dynamic Head (TDH) in feet of water.
6. Using the published curve for the pump find the Total Dynamic Head calculated above on the vertical axis and read the flow rate on the horizontal axis
7. This will give you the maximum flow rate within approximately 10%

Pressure Head: Gage PSI x 2.31 = Feet of Water
Suction Head: Gage “Hg x 1.13 = Feet of Water

EXAMPLE: If the Pressure Gage reads 14 PSI and the Vacuum Gage reads 6 " inches of mercury (Hg)
the approximate Total Dynamic Head (TDH) of the system would be 39.12 feet

Method 3: Use the maximum pump flow rate specified by the manufacturer.

Gravity Flow Calculation

Flow(gpm) = \sqrt{\frac{1786 \times [D\text{inch}]^5 \times H\text{inch}}{L\text{inch}}}

Example: Gravity flow through 2" IPS Schedule 40 PVC pipe with inside diameter 2.067" with 32.0 feet of pipe and 2 elbows of equivalent length of 6.0 feet. The top of the pipe opening into the collector tank is 8" below pool water level.

The flow (Q) in gpm is

\[ Q = \sqrt{\frac{1786 \times 2.067^5 \times 8}{32 + (2 \times 6)} \times 12} \]

\[ Q = 31.95 \text{ gpm} \]

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