|  |  |  |  |
| --- | --- | --- | --- |
|  | N measurement | Volumetric Flow (gpm) | Pressure Drop (psi) |
| Single Pump Configuration | 1 | 0 | 12 |
| 2 | 2 | 11 |
| 3 | 4 | 9 |
| 4 | 5 | 7 |
| 5 | 6 | 10 |
| 6 | 8 | 9 |
| 7 | 10 | 8 |
| 8 | 12 | 6 |
| 9 | 14 | 4 |
| 10 | 16 | 0 |
| Series Pump Configuration | 1 | 0 | 23 |
| 2 | 2 | 21 |
| 3 | 4 | 19 |
| 4 | 6 | 19 |
| 5 | 8 | 18 |
| 6 | 10 | 16 |
| 7 | 12 | 13 |
| 8 | 14 | 9 |
| 9 | 16 | 4 |
| 10 | 17.33 ± 0.57 | 0 |
| Parallel Pump Configuration | 1 | 0 | 12 |
| 2 | 2 | 11 |
| 3 | 3 | 10 |
| 4 | 4 | 9 |
| 5 | 7 | 10 |
| 6 | 10 | 9 |
| 7 | 13 | 8 |
| 8 | 16 | 6 |
| 9 | 19 | 4 |
| 10 | 22 | 0 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **N measurement** | **Volumetric Flow [gpm]** | **Reynolds Number [dimensionless]** | **Darcy Friction Factor from formula [dimensionless]** | **Darcy Friction Factor from Colebrook equation [dimensionless]** |
| 1” Pipes | 1 | 0 | 0 | -- | -- |
| 2 | 2 | 7107 | 15.433 | 0.034 |
| 3 | 3 | 10660 | 6.235 | 0.030 |
| 4 | 4 | 14214 | 3.157 | 0.028 |
| 5 | 7 | 24874 | 1.145 | 0.025 |
| 6 | 10 | 35534 | 0.505 | 0.023 |
| 7 | 12 | 42641 | 0.331 | 0.022 |
| 8 | 13 | 46195 | 0.266 | 0.021 |
| 9 | 16 | 56855 | 0.132 | 0.020 |
| 10 | 18 | 63962 | 0.087 | 0.020 |
| 11 | 20 | 71069 | 0.042 | 0.019 |
| 12 | 22 | 78176 | 0 | 0 |
| ¾” Pipes | 1 | 0 | 0 | -- | -- |
| 2 | 2 | 9476 | 2.849 | 0.031 |
| 3 | 3 | 14214 | 1.206 | 0.028 |
| 4 | 4 | 18952 | 0.610 | 0.026 |
| 5 | 5 | 23690 | 0.347 | 0.025 |
| 6 | 7 | 33165 | 0.221 | 0.023 |
| 7 | 9 | 42641 | 0.121 | 0.022 |
| 8 | 10 | 47379 | 0.098 | 0.021 |
| 9 | 13 | 61593 | 0.051 | 0.020 |
| 10 | 15 | 71069 | 0.031 | 0.019 |
| 11 | 17 | 80544 | 0.019 | 0.019 |
| 12 | 18 | 85282 | 0.013 | 0.019 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **N measurement** | **Volumetric Flow [gpm]** | **Reynolds Number [dimensionless]** | **Darcy Friction Factor from formula [dimensionless]** | **Darcy Friction Factor from Colebrook Equation [dimensionless]** |
| ½” Straight Pipes | 1 | 0 | 0 | -- | -- |
| 2 | 1 | 7107 | 0.786 | 0.034 |
| 3 | 2 | 14214 | 0.179 | 0.028 |
| 4 | 3 | 21321 | 0.079 | 0.025 |
| 5 | 4 | 28427 | 0.040 | 0.024 |
| 6 | 5 | 35534 | 0.023 | 0.023 |
| 7 | 7 | 49748 | 0.015 | 0.021 |
| 8 | 9 | 63962 | 0.009 | 0.020 |
| 9 | 10 | 71069 | 0.006 | 0.019 |
| 10 | 11 | 78176 | 0.005 | 0.019 |
| 11 | 12 | 85282 | 0.004 | 0.019 |
| 12 | 13 | 92389 | 0.003 | 0.018 |
| ½” Coiled Pipes | 1 | 0 | 0 | -- | -- |
| 2 | 0.5 | 3553 | 0.712 | 0.041 |
| 3 | 1 | 7107 | 0.162 | 0.034 |
| 4 | 1.25 | 8884 | 0.104 | 0.032 |
| 5 | 1.5 | 10660 | 0.065 | 0.030 |
| 6 | 2 | 14214 | 0.032 | 0.028 |
| 7 | 2.5 | 17767 | 0.026 | 0.027 |
| 8 | 3 | 21321 | 0.018 | 0.025 |
| 9 | 3.75 | 26651 | 0.010 | 0.024 |
| 10 | 4.25 | 30204 | 0.008 | 0.023 |
| 11 | 4.5 | 31981 | 0.007 | 0.023 |
| 12 | 4.75 | 33758 | 0.006 | 0.023 |