FLOW SIZING

The nomograph gives relationships of valve size, flow, velocity and pressure drop for various disc position.

Limitations:
Nomograph values are approximate.
Do not use equations for any of the conditions listed below, please consult factory.

a) For compressible fluids, where pressure (Δp) exceeds half of inlet pressure.
b) For non-compressible fluids, where pressure drop causes cavitation or flashing.
c) For dual-phase flow such as steam-water mixtures.

SAMPLE CALCULATION - LIQUID

Given:
Water (1.0 specific gravity) at 60°F is flowing through a 6-inch valve at a rate of 1,000 gpm.

Find:
Line velocity (ft./sec.) and pressure drop when valve is full-open (disc at 90°).

Solution:
From 6-inch valve size at lower left of nomograph, go diagonally up to the intersecting horizontal line for 1,000 gpm. From that point, proceed directly down to determine line velocity as 11 ft./sec.

For pressure drop, return to the 1,000 gpm intersection and continue up to "90° disc open" intersecting diagonal line. From this point, go horizontally to the left to determine pressure drop as 0.5 psi.

SAMPLE CALCULATION - GAS

Given:
Gas (.08 lb./cu. ft. density) is flowing through a 8-inch valve at a rate of 1,500 cu. ft./min.

Find:
Line velocity (ft./sec.) and pressure drop when valve is full-open (disc at 90°).

Solution:
From 8-inch valve size at lower left of nomograph, go diagonally up to the intersecting horizontal line for 1,500 cu. ft./min. From that point, proceed directly down to bottom line of nomograph to determine line velocity as 4000 (ft./min.).

For pressure drop, return to the 1,500 cu. ft./min. intersection and continue up to "90° disc open" intersecting diagonal line. From this point, go horizontally to the left to determine pressure drop as 17 psi. Now convert pressure drop to gas by dividing gas density by water density and multiplying by 17.

$$\Delta p = \frac{.08}{62.34} \times 17 = 0.22 \text{ psi}$$

NOMOGRAPH