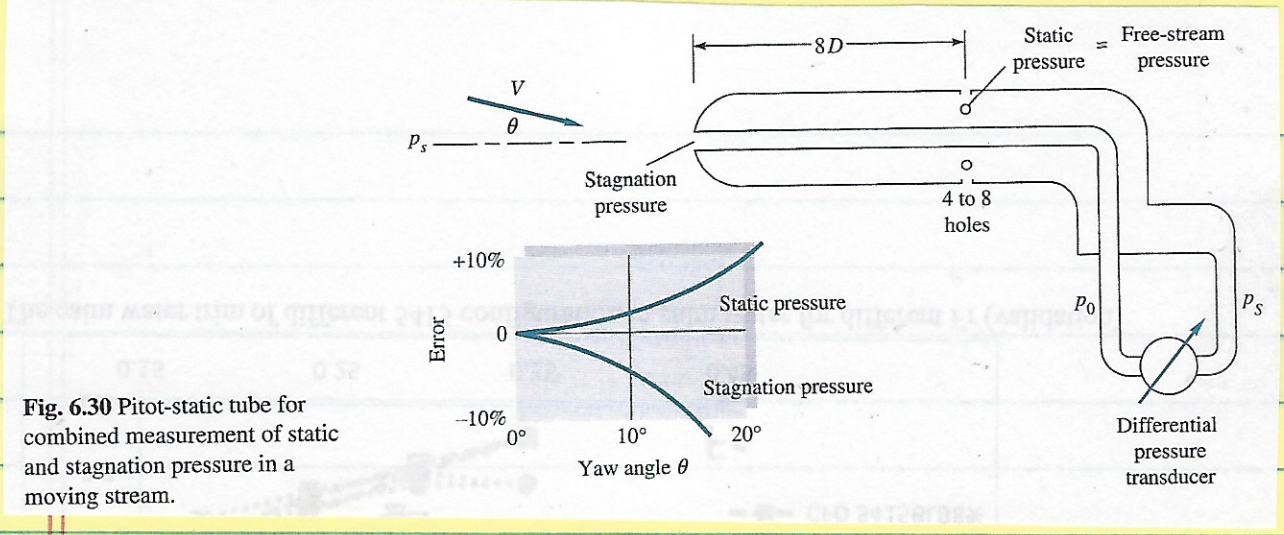

Fig. 6.30 Pitot-static tube for combined measurement of static and stagnation pressure in a moving stream.

$Re_D > 1000$ Henri de Pitot 1732

$$\underbrace{p_s + \tfrac{1}{2}\rho V_s^2 + \rho g z_s}_{\text{Static}} = \underbrace{p_0 + \tfrac{1}{2}\rho V_0^2 + \rho g z_0}_{\text{Stagnation}}$$ neglect δz

$$V = V_s = \left[\frac{2(p_0 - p_s)}{\rho}\right]^{1/2}$$

$\Delta p = p_0 - p_s$ measured using pressure transducer

limited frequency response ie mean flow and restricted transducer resolution

Requires flow angles ≤ 5 deg

Extensions 3 & 5 hole probes for 2D & 3D