

## DETERMINATION OF FLOW RATE BY PITOT TUBE

$$\dot{m} = a \frac{\rho D^2}{4} \sqrt{2 \rho \Delta p_{\text{eff}}}$$

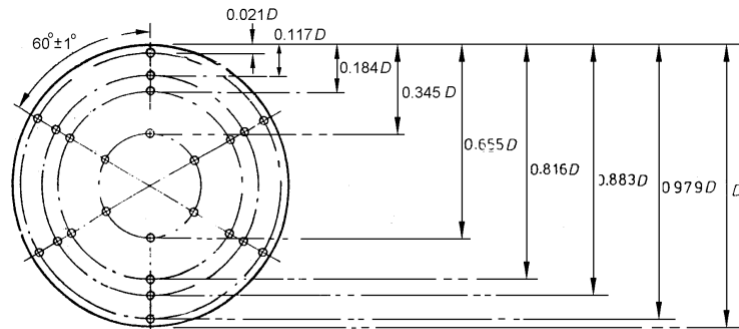
or

$$V = \frac{\dot{m}}{\rho A} = a \sqrt{\frac{2 \rho \Delta p_{\text{eff}}}{\rho}}$$

Where:  $\Delta p_{\text{eff}}$  = Effective differential pressure of the section traversed is determined from the average pressure from twenty four points across the tube section as follow:

$$\text{Mass flow } \dot{m} = a \frac{\rho D_x^2}{4} \sqrt{2 r_x \Delta p_{\text{eff}}} \quad ; \quad \text{Average velocity } V_x = \frac{\dot{m}}{r_x A_x} = a \sqrt{\frac{2 \Delta p_{\text{eff}}}{r_x}}$$

$$\text{Effective dynamic pressure } p_{\text{dyn},x} = \frac{\dot{m}^2}{2 r_x A_x^2} = a^2 \Delta p_{\text{eff}}$$



## LOCATION OF POSITIONS FOR TRAVERSE MEASUREMENT IN STANDARDIZED AIRWAYS

The value of  $\alpha$  is depend on Reynolds number as in the table below.

$Re_D$	$3 \times 10^4$	$10^5$	$3 \times 10^5$	$10^6$
$\alpha$	0.986	0.988	0.990	0.991