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NASA TECH BRIEF

Water Velocity Meter

A water current meter with a 0 to 6 ft/sec range has been developed for steady-state flow measurements. Two mutually perpendicular components of the drag force exerted on a perforated sphere (see fig.) are measured via strain-gage techniques similar to those applied in wind tunnel instrumentation. This force is then related to the flow velocity about the sphere as follows:

$F = \sqrt{F_x^2 + F_y^2}$ where F = drag force

Θ = flow direction

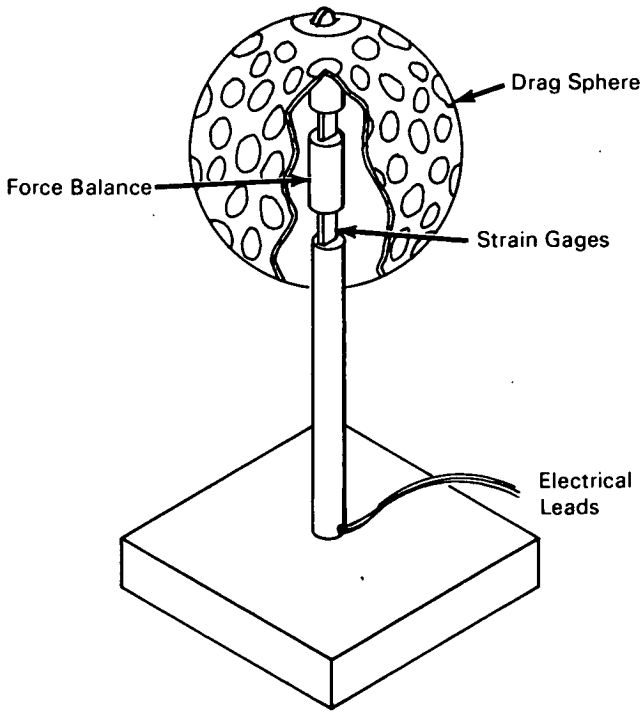
$\Theta = \tan^{-1} \frac{Fx}{Fy}$ ρ = fluid density

A = frontal area of drag sphere

$V = \sqrt{\frac{2F}{\rho A C_D}}$ C_D = drag coefficient

The velocity range of from 0 to 6 ft/sec corresponds to a force range on the order from 0 to 1.7 lb.

These drag sphere velocity meters are simple and relatively inexpensive; and, when combined with an appropriate data acquisition system, they are well suited to applications where a large number of simultaneous measurements are needed for current mapping or velocity profile determination.



Note:

Additional documentation may be obtained from:
Technology Utilization Officer
Langley Research Center
Hampton, Virginia 23365
Reference: TSP70-10662

Patent status:

No patent action is contemplated by NASA.

Source: D. L. Smith and C. W. Roberts
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