Pitot-static tubes

images: http://en.wikipedia.org/wiki/Pitot_tube

Simple Pitot Tube

Static Source

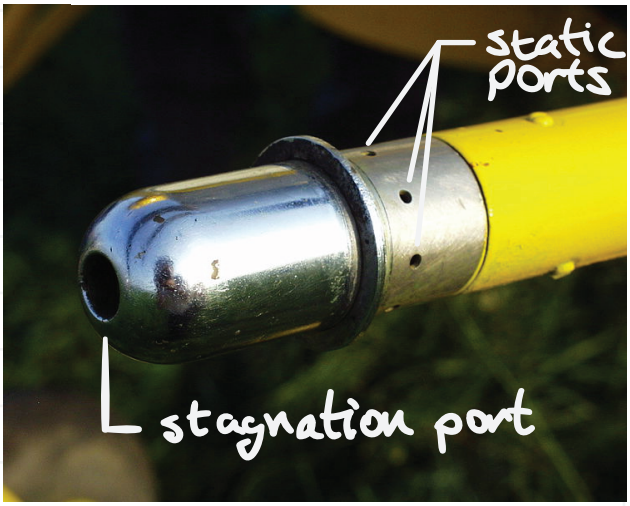
Pitot-Static Tube

Pitot-static tubes are used to measure fluid velocity. They use the principles of incompressible flow. Bernoulli's equation reduces to

p_t is the total pressure (in this case, equal to the stagnation pressure),
p_s is the static pressure,
ρ is the fluid density, +
v is the fluid velocity.

Equivalently,

$$\Delta p \equiv p_t - p_s = \frac{1}{2}\rho v^2 .$$



Example The velocity of a fluid flowing past a pitot-static tube is known to be 10 m/sec. The stagnation port has pressure 101.385 kPa and the static port has pressure 101.325 kPa. What type of fluid is it (probably)? Assume STP.