Aeroprobe Air-Data Specifications

Geometry and Construction

Probe Geometry	Straight (Typical), L-Shaped
Number of Holes	1 (Pitot), 3, or 5; with Additional Static Manifold
Tip Geometry	60° Conical, Hemispherical
Tip Diameter	6.35 mm, 4.8 mm, 3.2 mm Standard, Larger Probes By Request
Material	Brass Tip, Ferrules and Hex Mount. Shafts and Internal Tubing Stainless. All-Stainless Option Available.
Pneumatic Connections	Typical Exit Tubing of 0.89 mm – 1.6 mm (0.035" – 0.063") OD. Swagelok Fitting Option for 1.6 mm (or larger) Exit Tubes. Tygon R3603 Formulation, 1/32" ID, 3/32" OD Standard for Flex Tubing Connections
Mounting	Hex Prism (Standard), Rectangular Prism, Cylindrical. Custom Mounting Available
Probe Reference	Straight Probe: Flat on Hex Mount L-Shaped Probe: Plane of Probe Tip
Media	Air; Other Media Possible – Contact Aeroprobe
Operational Temperature	0°C – 150°C Standard, -80°C – 150°C with Heater (Heater Control May be Required)

Pressure Sensor Requirements and Data Reduction

Probe Type	Sensors/Reduction	Available Data
Pitot-Static	1 Differential + $\rho/M < 0.25$	$(P_t - P_s)$, V
	1 Differential & 1 Absolute + $T_t/M > 0.25$	P_t, P_s, M
3-Hole Pitch or Yaw w/Static Ring	2 Differential + $\rho/M < 0.25$	α or β,$(P_t - P_s)$,V
	2 Differential & 1 Absolute + $T_t/M > 0.25$	α or β, P_t, P_s, M
5-Hole Pitch+Yaw w/Static Ring	3 Differential + $\rho/M < 0.25$	α, β, $(P_t - P_s)$, V
	3 Differential & 1 Absolute + $T_t/M > 0.25$	α, β, P_t, P_s, M

P_t = Local Total Pressure, P_s = Local Static Pressure, α = Pitch Angle, β = Yaw Angle, $q = (P_t - P_s)$ = Dynamic Pressure (Incomp. Flows Only), T_t = Total Temperature, ρ = Density

Pressure Sensor Rating

Differential Pressure Range (psi / kPa):	Max Flow Speed, Sea Level Ambient = Total Pressure (m/s, Air):
±0.009 / 0.062	10
±0.018 / 0.124	15
±0.036 / 0.250	20
±0.072 / 0.500	30
±0.18 / 1.245	45
±0.36 / 2.49	65
±0.72 / 4.98	95
±1 / 6.9	110
±2 / 13.8	155
±5 / 34.5	260
±10 / 68.9	400
±15 / 103.4	N/A

Measurement Accuracy*

(w/Aeroprobe Calibration)

Flow Angles	Pitch Angle (α): ±0.15° ($\alpha < 12°$), ±0.4° ($\alpha < 20°$) Yaw Angle (β): ±0.15° ($\beta < 12°$), ±0.4° ($\beta < 20°$)
Air Speed	Air Speed (V): ±0.15% FS Typical, ±0.5% FS Max
Calibration Flow Angles	±20° Pitch and/or Yaw (3HP) ±20° Pitch and Yaw (5HP) Pitot-Static Probe Accuracy with Flow Angle can be Calibrated at up to 20°.
Calibration Flow Speeds	17 m/s to 345 m/s (Mach 0.05 - 1.0) for Probe Tip Diam. < 9.5 mm (3/8") 17 m/s to 65 m/s (Mach 0.05 - 0.19) for Probe Tip Diam. > 9.5 mm (3/8")
Auxiliary Data**	Absolute Reference Pressure, Total Temperature
Pressure Data Reduction	Up to 4th Order Polynomial Fits for Pressures, Angles (3HP, 5HP)
Frequency Response	Low, Best for Determining Time-Averaged Flows, Theoretical Time Lag Calculations Available Upon Request

*Utilizing 0.1% Accurate Pressure Sensors

**For Most Accurate Compressible Pressure-to-Velocity Reduction

Due to continual product development, ALTHEN and partners reserve the right to vary the foregoing details without prior notice.

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