

DATA SHEET

Kiel Pressure Probes

PRODUCT NAME

Kiel Pressure Probes

TYPE

Kiel Probe



Fig. 1 Kiel probe (left side) and rake with several Kiel probe heads installed (right side)

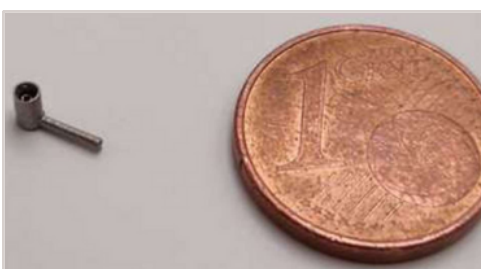


Fig. 2 Micro Kiel probe (\varnothing 1.6 mm)

DESCRIPTION

Vectoflow's Kiel pressure probes can capture the total pressure of the flow at an angle of attack up to 60°. At the same time, it offers all advantages of additive manufacturing, like geometric flexibility and robustness. Kiel pressure probes can be purchased either as a single unit or as part of a probe rake, with a specified number of probe heads. Vectoflow's Kiel pressure probes allow a wide angular range without significant error of the total pressure measurement.

Kiel pressure probes can be manufactured with a diameter as small as 1.6 mm (see Fig. 2). The diameter of the tube extension may be chosen up to 8 mm, matching the required probe stiffness. Necessary calculations to determine the optimal sizes are also available on request.

GENERAL

Geometry	Straight, L-shaped, Cobra, custom
Max length	≤ 100 mm (one-part design) > 100 mm (multi-part designs)
Min. typ. diameter	Ø 1.6 mm (micro Kiel probe) Ø 5 mm standard Kiel
Material	Stainless steel, Titanium, Inconel
Fastening type	None, square, hexagonal, one-sided flattened, cylinder, threaded or custom
Connections	Standard 1mm or 1.6 mm pressure tubes, other on request
Temperature range	Up to 800°C, depending on material

MEASUREMENT RANGE

Angular range	≤ ±58° for Kiel probes ≤ ±45° for micro-Kiel probes
Velocity range	From 3 m/s to > 343 m/s

ANGULAR MEASUREMENT RANGE

The following table shows an overview of the angular measurement range of different Kiel probes.

Probe Part number	Probe diameter [mm]	Flow Angle Measurement range [°]
L_KP_f6ekk1	1.6	44
L_KP_7uhr31	2.0	50
S_KP_uxzsz1	3.0	44
S_KP_bmaob5	3.8	48
S_KP_bcef5p	6.35	60
S_KP_rcpwit	6.5	51

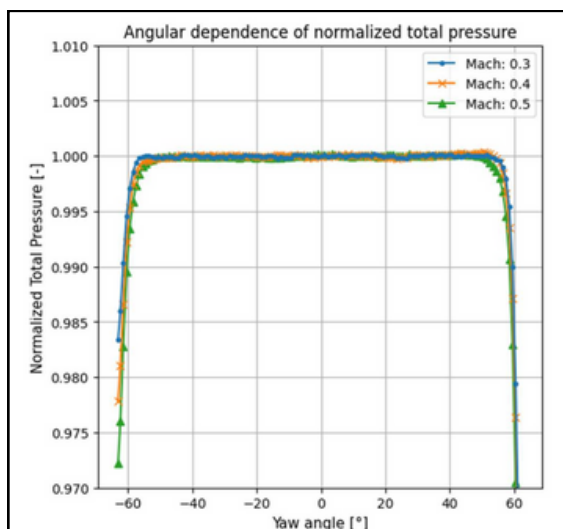


Fig. 3 Normalized total pressure measured by a Kiel probe as function of the yaw angle for three different Mach numbers. The total pressure measured is 99% accurate for the angles in the range [58.5°, -60.5°] for all three studied Mach numbers.