

# MODULAR DIGITAL 7-HOLE PROBE SYSTEM

This fully self-contained, high-precision and robust flow measurement solution provides a compact, low-cost alternative to optical flow diagnostics. Ideal for use in wind-tunnel, UAV and motorsport applications, this probe offers industry-leading functionality at a fraction of the cost of comparable systems.

The modular structure enables probe stings to be interchanged, for fast replacement in case of damage and the option of using a variety of sting architectures with a single sensor package.

- Flow speed ranges possible from 1.1 m/s – 100 m/s at standard conditions
- Three components of velocity returned; all software, drivers and NI LabVIEW development kits included
- Modular structure enables sting to be changed within seconds avoiding the need for time-consuming repairs
- Local fluid temperature, humidity and absolute static pressure also measured
- Inertial positioning sensor for automatic alignment and vibration warning
- Low-profile, in-line sensor package measuring under 20 mm in diameter
- Option of integrated static pressure ring in the probe sting



## Specification

| Standard sensor specifications (custom available on request) |  |              |              |
|--|--|--------------|--------------|
| Product code   | IDXHP-160P   | IDXHP-1K0    | IDXHP-6K9    |
| Standard pressure ranges                                     | 160 Pa FS  | 1 kPa FS     | 6.9 kPa FS   |
| Maximum overpressure   | 33.5 kPa   | 37.5 kPa     | 69 kPa       |
| Sensor accuracy <sup>1</sup>                                 | ± 0.1 % FS   |              |              |
| Total error band after auto-zero <sup>2</sup>                | ± 0.5 % FS   | ± 0.25 % FS  | ± 0.25 % FS  |
| Operational mode   | Absolute and differential configurations available |              |              |
| Compensated temperature range                                | -40° to +65° C                                     | 0° to +50° C | 0° to +50° C |
| Operating temperature range                                  | -40° to +65° C non-condensing                      |              |              |
| Storage temperature range                                    | -40° to +65° C non-condensing                      |              |              |
| Vibration  | Sensors rated to 15 g, 10 Hz to 2 Hz               |              |              |
| Maximum relative humidity                                    | 95 %   |              |              |

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|   |                           |
|---|---------------------------|
| Relative ambient humidity sensor specification        | 0 % to 100 % RH, +/- 3%   |
| Ambient temperature sensor specification <sup>3</sup> | 0°C - 65°C ± 0.5°C        |
| Ambient absolute pressure sensor specification        | 30-110 kPa FS, +/- 0.1kPa |

| Standard probe specifications (custom available on request) |   |  |
|---|---|--|
| Product code  | ID7HP-XXX   | ID8HP-XXX  |
| Static pressure measurement                                 | -   | Integrated absolute pressure transducer                        |
| Reference pressure  | Available either with static pressure ring on sting or connection to laboratory reference       |  |
| Standard sting material                                     | Steel   | CFRP   |
| Sting diameter  | 3.7 mm or 12 mm   | 12 mm  |
| Standard tip geometry                                       | Hemispherical   | Hemispherical  |
| Angular measurement range <sup>4</sup>                      | ± 45° to ± 60°  | ± 45° to ± 60°   |
| Sting heater  | -   | Optional film heater located between sting tip and static ring |
| Sting tip temperature measurement                           | -   | -80°C - 150°C ± 1°C  |
| Remote temperature probe                                    | -40°C - 150°C ± 0.5°C   | 2x -80°C - 150°C ± 1°C   |
| Absolute temperature limits                                 | 5° to +65° C non-condensing   | -80° to +65° C (expected) non-condensing <sup>5</sup>          |
| Absolute pressure limits                                    | 0.2 - 1.5 atm   | 0 - 1.5 atm  |
| Weight (approximate)  | 45 g  | 95 g   |
| Voltage   | 6-24 VDC or via USB   | 6-24 VDC system<br>28 VDC sting heater                         |
| Power   | min. 290 mW   | min. 310 mW heater off/<br>2310 mW heater on                   |
| Communications interface                                    | USB2.0 & UART, RS232 or UDP Ethernet available  |  |
| Data acquisition rate                                       | 1 kHz (equivalent)  |  |
| Digital resolution  | 24-bit pressure, 16-bit environmental and IMU   |  |
| System requirements   | Windows 7 or later, minimum 3GHz & 4Gb RAM  |  |
| IMU specification   | 3 axis gyro, 125 °/s FS, ± 3.9 x10 <sup>-3</sup> °/s<br>3 axis accelerometer, 2g FS, ± 0.061 mg |  |

<sup>1</sup> Includes errors due to pressure non-linearity, pressure hysteresis, non-repeatability and calibration uncertainty.

<sup>2</sup> Total residual error after auto-zero, excluding residual temperature sensitivity.

<sup>3</sup> Temperature is recorded at the location of the PCB. Waste heat from electronic components may distort temperature readings.

<sup>4</sup> Angular range specified for hemispherical tip; depends on tip geometry and calibration.

<sup>5</sup> Temperature limits are design limits, based on assumptions about heat transfer at high altitudes

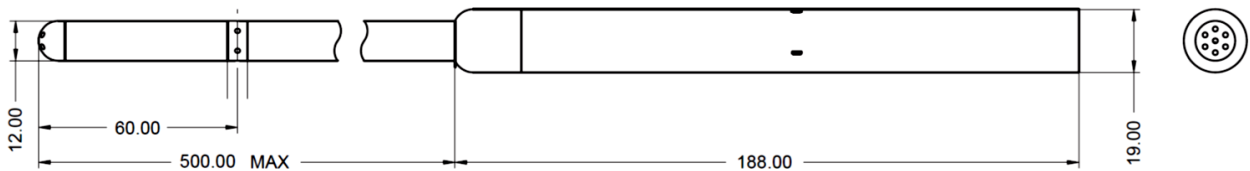
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## Additional custom modifications available:

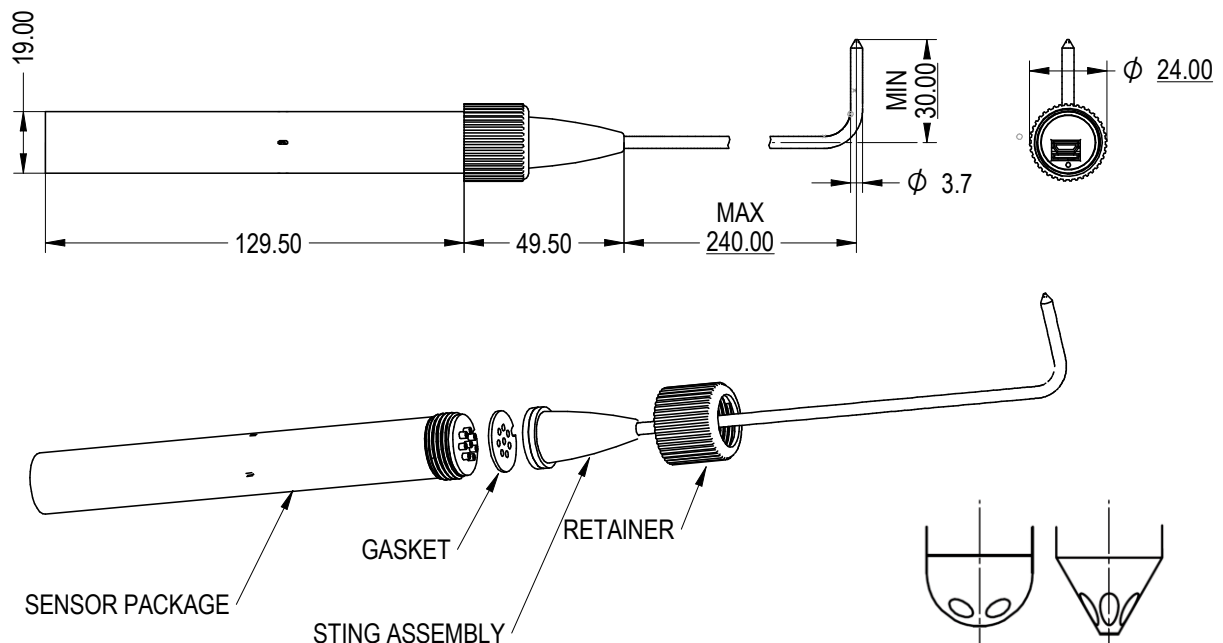
- Variety of probe geometries available
- Probe diameters down to <2 mm
- Steel or low-mass nylon/CFRP enclosures
- Sting and sensor heaters available for icing applications
- Custom enclosure design service
- Custom software and driver development service
- Calibration service
- Extended product support and warranty
- External trigger/synch configuration available

## Dimensions

**ID8HP** (Stings available in CFRP, 316 stainless or nylon, with or without heaters)



**ID7HP** (Stings available in 3.7 mm and 12 mm OD as standard, straight or 90°; custom geometries possible)



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