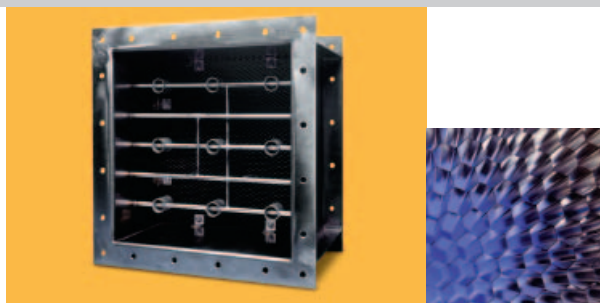


The Thermo Scientific DSK1000 pitot averaging air/gas flow sensor is ideal for maintaining high repeatability when a minimal amount of straight run pipe is available. Regardless of the flow pattern, this multi-point, inline flow sensor achieves high measurement accuracy for superior process control.

## Thermo Scientific DSK1000

### Pitot Averaging Air/Gas Flow Sensor



#### Features & Benefits

- Accuracy of  $\pm 1.0\%$  for round model and  $\pm 2.0\%$  for rectangular model
- Repeatability of  $\pm 0.1\%$  for round model and  $\pm 0.2\%$  for rectangular model
- Multi-point design ensures repeatable measurement regardless of flow pattern
- Low permanent pressure loss
- Minimal straight run pipe needed (typically only 5 up/2 down) to achieve optimal performance
- Maximum turndown of 40:1
- Welded or bolted flanges
- 12-in flange-to-flange depth

#### Accurate and Repeatable

Based on pitot averaging technology, the Thermo Scientific DSK1000 serves a variety of industrial applications, including combustion control at refineries, power plants and paper mills. This industry leading sensor provides accurate, repeatable measurement of air and/or gas flow and enables high repeatability to be maintained even when very little straight run pipe is available. Typically only five up/two down of straight run pipe is required to achieve optimal performance.

#### Industrial Design

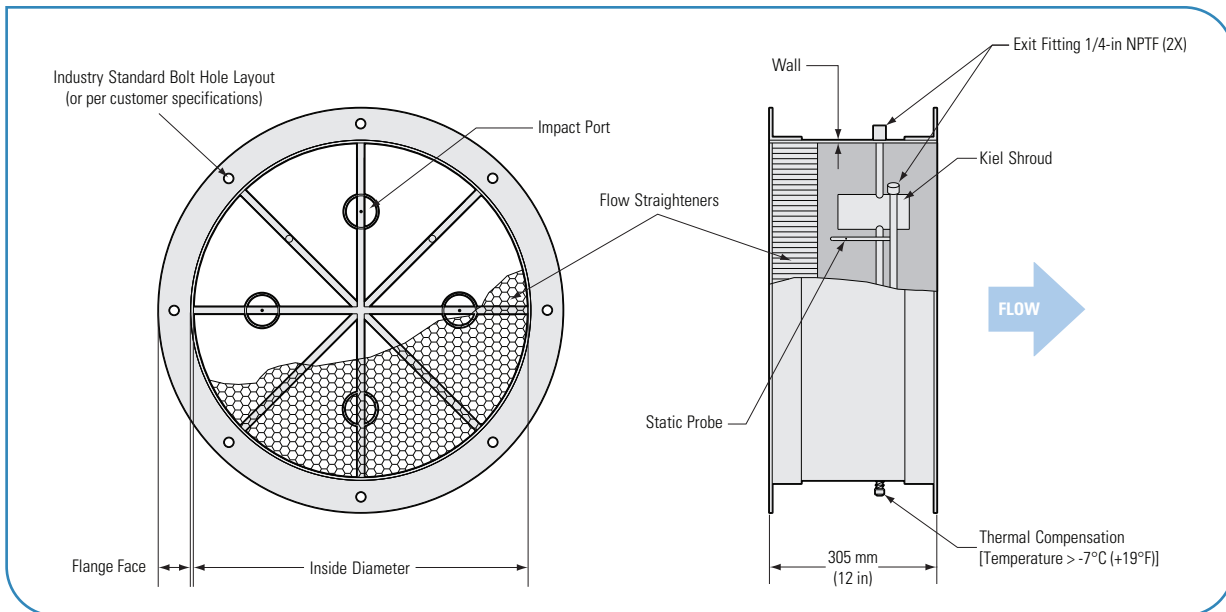
The DSK1000 has four primary design elements: integral flow straighteners, a multi-point pitot array, kiel shrouded impact ports and static wands. The integral flow straighteners dramatically increase repeatability by eliminating most of the errors caused by turbulence, swirl and other irregularities in the flow stream, and offer the same conditioning effect as seven to nine diameters of straight run. The multi-point pitot array incorporates hemispherically-shaped static wands and

kiel-shrouded impact ports that are evenly distributed over the entire cross-section of the duct. The static wands are positioned parallel with the flow stream to ensure actual static pressure measurement with no correction factors required. The kiel-shrouded impact ports significantly minimize the effects of turbulent flow for improved signal quality and increased accuracy.

#### Applications

- Combustion air flow
- Flue gas recirculation flow
- Overfire air flow
- Secondary air flow
- Primary air flow
- Catalytic denoxing flue gas flow
- Fluidized bed dryer flow: pills and candies
- Preheated combustion air flow with fly ash
- Aeration basin flow
- Zone dryer air flow: tobacco drying/blending, film & paper drying

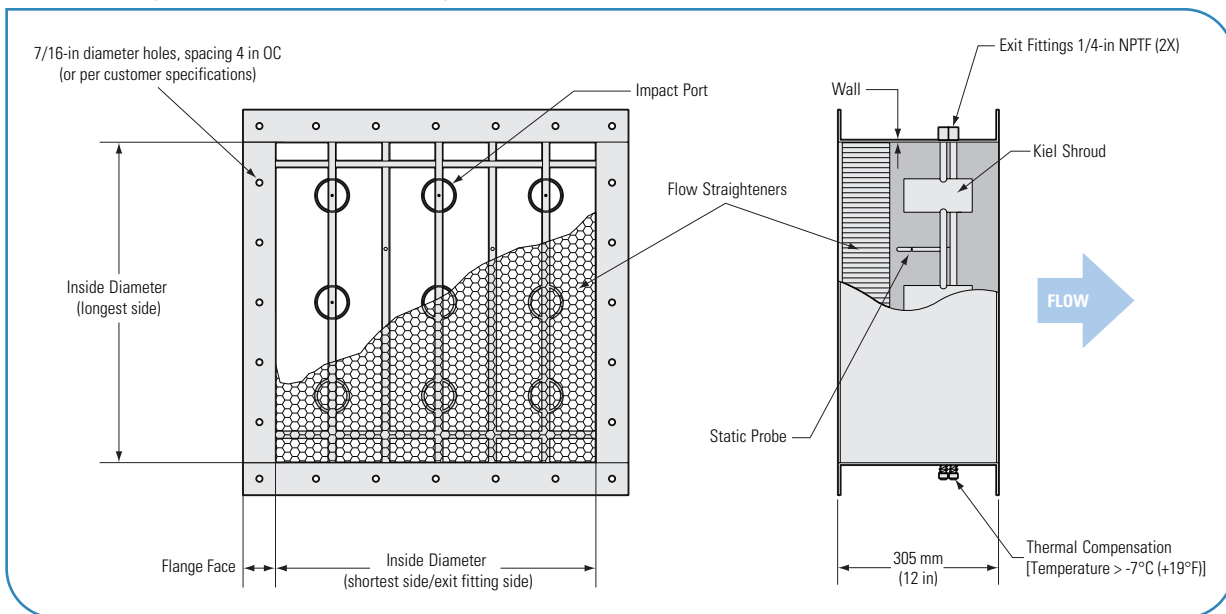
**DSK1000 (Circular Model) Dimensional Drawing**



**DSK1000 (Circular Model) Standard Dimensions**

Inside Diameter	Wall Thickness	Flange Face	Exit Fitting
200 mm to 611 mm (8.0 in to 24.0 in)	1.6 mm (0.063 in)	38.1 mm (1.5 in)	¼ in NPTF
612 mm to 865 mm (24.1 in to 34.0 in)	1.9 mm (0.075 in)	50.8 mm (2.0 in)	¼ in NPTF
866 mm to 1321 mm (34.1 in to 52.0 in)	2.7 mm (0.105 in)	50.8 mm (2.0 in)	¼ in NPTF
1322 mm to 1830 mm (52.1 in to 72.0 in)	2.7 mm (0.105 in)	76.2 mm (3.0 in)	¼ in NPTF
1831 mm (72.1 in) or greater	Consult Thermo Fisher	Consult Thermo Fisher	¼ in NPTF

**DSK1000 (Rectangular Model) Dimensional Drawing**



**DSK1000 (Rectangular Model) Standard Dimensions**

Inside Diameter (long side)	Wall Thickness	Flange Face	Exit Fitting
254 mm to 611 mm (10.0 in to 24.0 in)	3.2 mm (0.125 in)	50.8 mm (2.0 in)	¼ in NPTF
612 mm to 1220 mm (24.1 in to 48.0 in)	3.2 mm (0.125 in)	63.5 mm (2.5 in)	¼ in NPTF
1221 mm to 1830 mm (48.1 in to 72.0 in)	4.8 mm (0.188 in)	63.5 mm (2.5 in)	¼ in NPTF
1831 mm (72.1 in) or greater	6.4 mm (0.250 in)	63.5 mm (2.5 in)	¼ in NPTF

**MODEL NUMBER**

- DSK10:** Circular carbon steel casing and flanges (12-in flange-to-flange dimension)
- DSK12:** Rectangular carbon steel (12-in flange-to-flange dimension)
- DSK14:** Circular stainless steel (12-in flange-to-flange dimension)
- DSK16:** Rectangular stainless steel (12-in flange-to-flange dimension)
- DSK1X:** Circular; special (consult Thermo Fisher Scientific)
- DSKXX:** Rectangular; special (consult Thermo Fisher)

**5. SENSOR ASSEMBLY**

- 2:** 304 SS Pitot Array with Hemispherical Static Wands
- 5:** 316 SS Pitot Array with Hemispherical Static Wands
- X:** Special (consult Thermo Fisher)

*NOTE: Kiel shrouds not used on circular sizes of 901.7 mm (35.5 in) diameter or less and rectangular sizes where area is less than 14.6 m<sup>2</sup> (577 in<sup>2</sup>).*

**2. FLOW STRAIGHTENERS**

- 0:** None
- 1:** Aluminum
- 2:** 304 SS, welded every other node
- 3:** 304 SS, 6 mm (0.24 in) thickness, welded each node (for velocities greater than 5000 FPM)
- X:** Special (consult Thermo Fisher)

**X. SIZE**

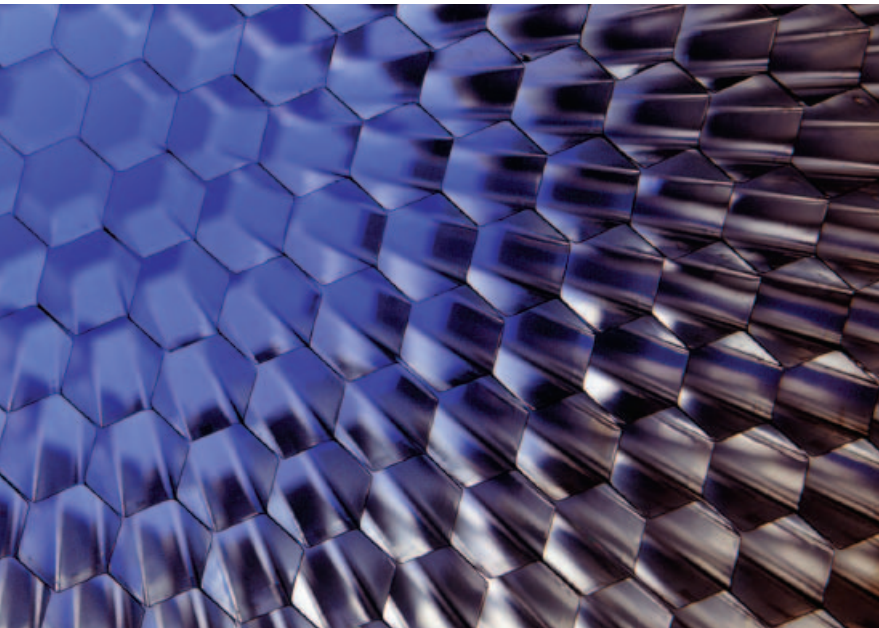
- X:** Circular: Inside dimension and unit of measure
- X:** Rectangular: Inside dimension (both sides) and unit of measure

**1. FLANGES**

- 0:** No flanges (weld-in service)
- 1:** Standard flanges with Thermo Scientific bolt pattern
- 2:** Standard flanges without bolt holes
- X:** Special (consult Thermo Fisher)



*NOTE: Flow calculations will be based on conditions supplied at time of order. Temperature range, pressure range, flow or velocity range, molecular weight, and gas composition are necessary to insure unit design will meet application requirements. Specify tagging if applicable.*



**Installation Flexibility**

Built for rugged industrial environments, the DSK1000 is often times installed on large ducts measuring at least 10 feet in width. Depending on the duct shape, round or rectangular flow elements are available with a standard flange-to-flange depth of 12 inches. The option of stainless or carbon steel components ensures application-specific needs are met without the possibility for corrosion or damage that certain gases may cause.

### Customer Care

Thermo Scientific instruments are recognized for outstanding performance and reliability. To ensure maximum uptime, we offer comprehensive service and support programs worldwide on all products via a network of factory-trained and highly qualified engineers. Our experts will help keep your Thermo Scientific instruments in optimal working condition.

## Thermo Scientific DSK1000

### Performance Specifications

Accuracy	Circular: typically $\pm 1\%$ with flow straighteners Rectangular: typically $\pm 2\%$ with flow straighteners
Repeatability	Circular: $\pm 0.1\%$ with flow straighteners Rectangular: $\pm 0.2\%$ with flow straighteners
Differential Pressure (DP) Signal	Up to 6.25-in water column (w.c.) DP (159 mmwg) depending on velocity
Unrecovered Pressure Loss	Approximately 30% of measured DP; Example: at a velocity of 4000 FPM @ STP, measured DP is 1.0-in w.c.; Permanent pressure loss is 30% of 1.0-in w.c., or 0.30-in w.c.
Velocity Range	Effective velocity range of 1.27 to 50.8 m/s (250 to 10,000 fpm) of air @ +20°C (+68°F), 14.7 PSIA

### Functional Specifications

Maximum Static Pressure	Circular: carbon steel casing, 6 PSIG (0.27 BAR) @ +163°C (+325°F); 304 SS casing, 8 PSIG (0.87 BAR) @ +400°C (+750°F) Rectangular: carbon steel casing, 1 PSIG (0.07 BAR) @ +163°C (+325°F); 304 SS casing, 1 PSIG (0.07 BAR) @ +400°C (+750°F) Consult Thermo Fisher for high pressure configurations
Temperature	-128°C to +400°C (-200°F to +750°F); With aluminum flow straighteners: -55°C to +162°C (-67°F to +300°F) Consult Thermo Fisher for higher temperatures

### Physical Specifications

Minimum Size	Circular: 200-mm (8-in) diameter Rectangular: 254 mm (10 in) per side For smaller size, consult Thermo Fisher
Sensing Array	304 or 316 SS with Argon welded joints
Process Connections	316 SS, 1/4 NPTF
Flow Straighteners	3/8-in hexagonal cells, either aluminum (3.5-in deep), 304 SS or 316 SS (2.5-in deep) Stainless steel is of welded construction For high velocities, consult Thermo Fisher for reinforced flow straighteners (6 mm thick, welded every node)
Casing/Flanges	Carbon steel (epoxy coated with rust inhibiting primer), 304 SS or 316 SS; All joints continuously seam welded; Flanges with bolt holes standard; Note: Flange mounting hardware not supplied

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