Thin-Film Heat Flux Sensors

HFS Series Starts at $153

Effective for Convection, Conduction and Radiation Heat Transfer
Conveniently Interfaces with Voltmeters and Recorders
Easily Attaches to Curved and Flat Surfaces
Temperature Range from -200 to 150°C (-330 to 300°F)

Each HFS series heat flux sensor functions as a self-generating thermopile transducer. It requires no special wiring, reference junctions or signal conditioning. A readout is accomplished by connecting a sensor to any direct reading DC microvoltmeter or recorder.

The HFS series sensor is designed for precise measurement of heat loss or gain on any surface. It can be mounted on flat or curved surfaces, and employs butt-bonded junctions with a very low thermal profile for efficient reading. The sensor is available with an integral thermocouple for discrete temperature measurement needed to describe the heat flux, and is available in two different sensitivity ranges. All models utilize a multi-junction thermopile construction. The carrier is a polyimide film which is bonded using a PFA lamination process.

Specifications
Upper Temperature Limit: 150°C (300°F)
Number of Junctions:
  HFS-3: 54
  HFS-4: 112
Carrier: Polyimide Film (Kapton®)
Nominal Sensor Resistance:
  HFS-3: 140 Ω
  HFS-4: 175 Ω
Lead Wires: #30 AWG solid copper, PFA insulated color coded, 3.1 m (10' long)
Weight: 28 g (1.0 oz)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Nominal Sensitivity (µV/Btu/Ft²-Hr)</th>
<th>Max Rec’d Heat Flux (Btu/Ft²-Hr)</th>
<th>Built-in T/C Type K</th>
<th>Resp. Time (sec)</th>
<th>Thermal Capacitance (Btu per °F Ft²)</th>
<th>Thermal Resistance (°F per Btu/Ft²-Hr)</th>
<th>Nominal Thickness mm (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFS-3</td>
<td>3.0</td>
<td>30,000</td>
<td>YES</td>
<td>0.60</td>
<td>0.02</td>
<td>0.01</td>
<td>0.18 (0.007)</td>
</tr>
<tr>
<td>HFS-4</td>
<td>6.5</td>
<td>30,000</td>
<td>YES</td>
<td>0.60</td>
<td>0.02</td>
<td>0.01</td>
<td>0.18 (0.007)</td>
</tr>
</tbody>
</table>

* Exceeding the maximum recommended heat flux can result in a large enough temperature rise to cause delamination of the Kapton® bonding material. The given maximum values assume a 38°C (100°F) ambient.
† Nominal sensitivity is ±10%. Sensitivity is supplied with unit.

For epoxies and cements compatible with HFS Series, see OMEGABOND® epoxies on page F-21.

To Order (Specify Model Number)

<table>
<thead>
<tr>
<th>Model Number**</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFS-3</td>
<td>$153</td>
<td>3.0 µV/BTU/Ft²-Hr sensor w/Type K TC</td>
</tr>
<tr>
<td>HFS-4</td>
<td>160</td>
<td>6.5 µV/BTU/Ft²-Hr sensor w/Type K TC</td>
</tr>
</tbody>
</table>

Comes with complete operator’s manual and sensitivity calibration.

** Other sizes and styles available, consult Applications Engineering.
More than 100,000 Products Available!

- **Temperature**

- **Flow and Level**
  - Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

- **pH and Conductivity**
  - Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

- **Data Acquisition**

- **Pressure, Strain and Force**
  - Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

- **Heaters**