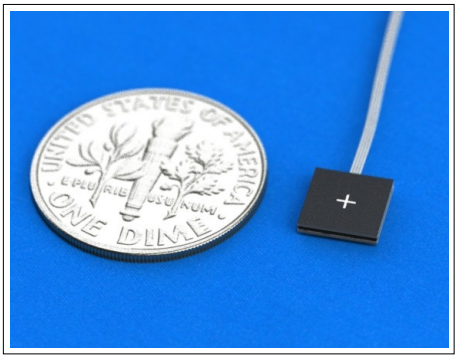
Thermoelectric Heat Flux Sensor — HFD03-060-04L06

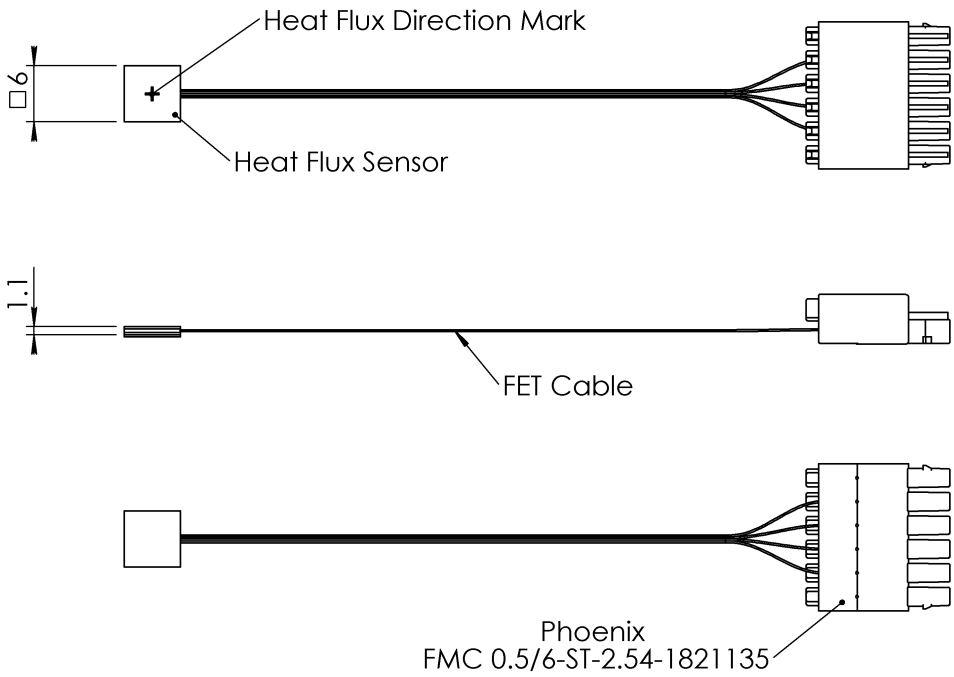


The HFD03-060-04L06 – high sensitive and self-calibrating sensor of conduction, convection and radiation heat fluxes in a wide range of heat flux intensities. Compatible with RMT Datalogger DX8140.

- Ultra-High Sensitivity
- Miniature Dimensions
- Self-calibrating
- FET cable
- Phoenix Connector

Sensitivity Se	μV/(W/m^2)	17.3
Integral sensitivity Sa	V/W	0.48
Heat Flux Range Pe	±W/m^2	10 000
Integral Heat Flux Range Pa	±W	0.35
Thermal Time Constant	s	1.5
Thermal Resistance RT	K/(W/m^2)	1.10E-03
Integral Thermal Resistance RT	K/W	29.2

Dimensions (mm)



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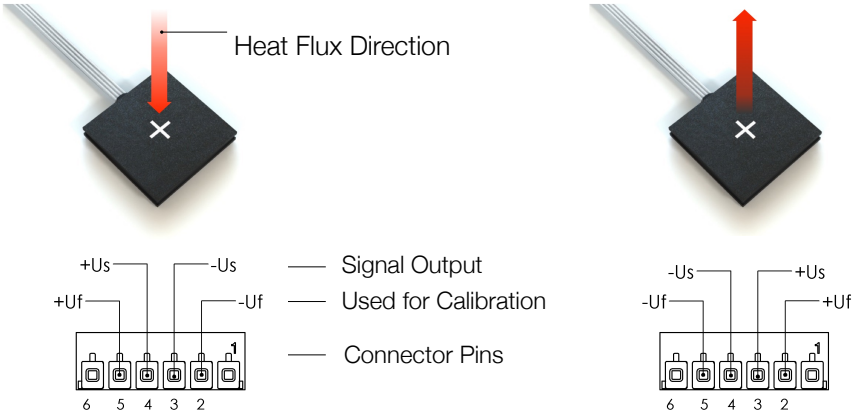
Detailed Specification — HFD03-060-04L06

Sensor Type		Thermoelectric
Surface material		Aluminum, painted black
Protection class (2)		IP67
Surface dimensions AxB	mm^2	6x6
Thickness H	mm	1.1
Pellet pairs		60
Sensitivity Se	$\mu V/(W/m^2)$	17.3
Integral sensitivity Sa	V/W	0.48
Heat Flux Range Pe	$\pm W/m^2$	10 000
Integral Heat Flux Range Pa	±W	0.35
Thermal Time Constant	s	1.5
Thermal Resistance RT	$K/(W/m^2)$	1.10E-03
Integral Thermal Resistance RT	K/W	29.2
Electrical Resistance ACR	Ohm	5.36
Temperature Dependence (3) dS/dT	%/°C	0.25
Linearity with Power dS/dP	$\pm\%/(W/m^2)$	0.03%
Homogeneity dS/dA	±%	1
Calibration Accuracy	±%	3
Calibration Temperature Range	°C	-40 … +80
Operating Temperature Range	°C	-50 … +150
Max. compressive Force for clamping	kg	11
Cable Length (4) L	cm	180
Connector type (5)		FMC 0,5/6-ST-2,54-18211355
RoHS		Compliant

1. Performance parameters shown in specifications are given for ambient temperature Ta=300 K (27 °C)
2. Application in water - not more than 1 hour. Maximum temperature 100°C.
3. Average value at Ta=300 K (27 °C). Detailed temperature dependence is given in table
4. Sensor is equipped with thin FEP Flat Ribbon Cable, 0.025” Pitch, 32 AWG, 1,8 m.
   Wire resistance 0.54Ohm/m
5. Cable is ended by miniature connector FMC 0,5/6-ST-2,54-18211355 (Phoenix).
   The reciprocal connector p/n is MCV 0,5/6-G-2,54 SMD R44-1821588

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Pinout Configuration — HFD03-060-04L06



RMT Heat Flux Sensor Cable is ended by miniature connector FMC 0,5/6-ST-2,54-18211355 (Phoenix).
The reciprocal connector p/n is MCV 0.5/6-G-2.54 SMD R44-1821588 (not included).

Self-Calibration Method

Sensitivity of thermoelectric heat flux sensor Sa [V/W]

$$Sa = \frac{U}{P} = N \times \alpha \times Rt$$

U – sensor signal at heat flux Pe;
N – number of pellet pairs inside a sensor;
RT – thermal resistance;
α – Seebeck coefficient (average value P-N pair)

Figure-of Merit Z of thermoelectric sensor

$$Z = \frac{(N \times \alpha)^2 \times Rt}{ACR}$$

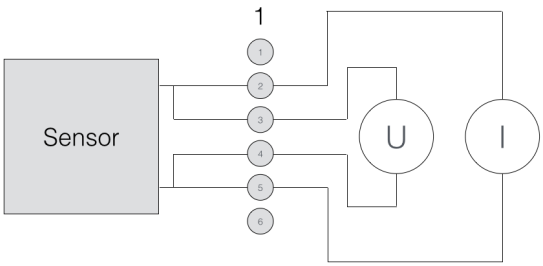
Calibration expression with use of Z, ACR and Seebeck coefficient α

$$Sa = \frac{1}{(\alpha \times N)} \times Z \times ACR$$

$$Se = Sa \times S$$ where S - surface area

Measurement Scheme

Self-calibration to be made by measurement of Figure-of-Merit and ACR Resistance of thermoelectric heat flux sensor by four-wire method which is provided by four wires of the FET cable connected to the sensor.



Use series of Z-Meters made by RMT for measurement of Figure-of-Merit and ACR resistance of thermoelectric heat flux sensor.

Or RMT Datalogger DX8140 developed for HTX, HFX series of heat flux sensors.

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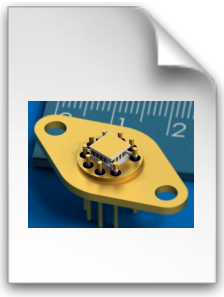
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