

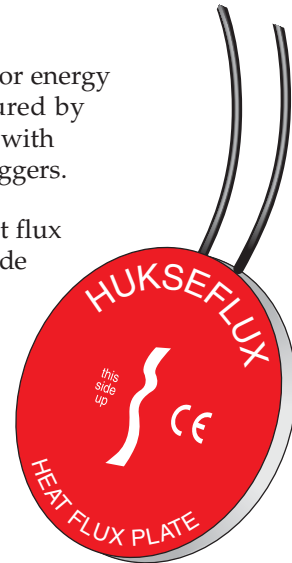
# Heat Flux Sensors

## Models HFP01, HFP01SC

Both the HFP01 and HFP01SC provide soil heat flux measurements—typically for energy balance or Bowen ratio flux systems. These heat flux sensors are manufactured by Hukseflux (Delft, The Netherlands) for Campbell Scientific, and are compatible with most of our dataloggers. They are not compatible with our CR200-series dataloggers.

The HFP01 and HFP01SC output a voltage signal that is proportional to the heat flux of the surrounding medium. At least two sensors are required for each site to provide spatial averaging. Sites with heterogeneous media may require additional sensors.

The HFP01SC is a self-calibrating version of the HFP01. It self-calibrates using the "Van den Bos-Hoeksma" method; an internal heater is included for this process. Self-calibration corrects for errors due to differences in thermal conductivity between the sensor and surrounding medium, temperature variations, and slight sensor instabilities. The calibration process takes approximately eight minutes and is typically performed every two hours.



### Ordering Information

HFP01-L Heat flux sensor with user-specified lead length; enter lead length, in feet, after the L.

HFP01SC-L Self-calibrated heat flux sensor with user-specified lead length; enter lead length, in feet, after the L.

### Specifications

Temperature Range:  $-30^{\circ}$  to  $+70^{\circ}\text{C}$

Plate Thickness: 0.20" (5 mm)

Plate Diameter: 3.15" (80 mm)

Weight: 7.05 oz (200 g)

#### HFP01

Sensor: Thermopile

Measurement Range:  $\pm 2000 \text{ W m}^{-2}$

Signal Range (nominal):  
 $\pm 100 \text{ mV}$  for  $\pm 2000 \text{ W m}^{-2}$  range

Accuracy:  
 $\pm 20\%$  for daily totals over a thermal conductivity range from  $0.1$  to  $1.7 \text{ W m}^{-1} \text{ K}^{-1}$  and temperature range of  $-30^{\circ}$  to  $+70^{\circ}\text{C}$ . Better if thermal conductivity and temperature ranges are limited.

Thermal Conductivity Dependence:  
 $\pm 15\%$  over thermal conductivity range from  $0.1$  to  $1.7 \text{ W m}^{-1} \text{ K}^{-1}$

Temperature dependence:  $<0.1\%$  per  $^{\circ}\text{C}$

Sensitivity (nominal):  $50 \mu\text{V W}^{-1} \text{ m}^{-2}$

#### HFP01SC

Sensor: Thermopile with film heater

Measurement Range:  $\pm 100 \text{ W m}^{-2}$

Signal Range (nominal):  $\pm 5 \text{ mV}$  for  $\pm 100 \text{ W m}^{-2}$  range,  
 $0$  to  $2 \text{ V}$  while film heater is powered

Accuracy:  $\pm 3\%$  of reading

Thermal Conductivity:  $0.8 \text{ W m}^{-1} \text{ K}^{-1}$

Power Consumption During Self Calibration:  
 $1.3 \text{ W}$  ( $108 \text{ mA}$  @  $12 \text{ Vdc}$ )

Sensitivity (nominal):  $67 \mu\text{V W}^{-1} \text{ m}^{-2}$

Sensor Resistance (nominal):  $2 \Omega$

Heater Resistance (nominal):  $100 \Omega$

Current Sensing Resistor:  $10 \Omega$ ,  $1\%$ ,  $0.25 \text{ W}$

