HFP01 and HFP01SC

Heat Flux Sensors

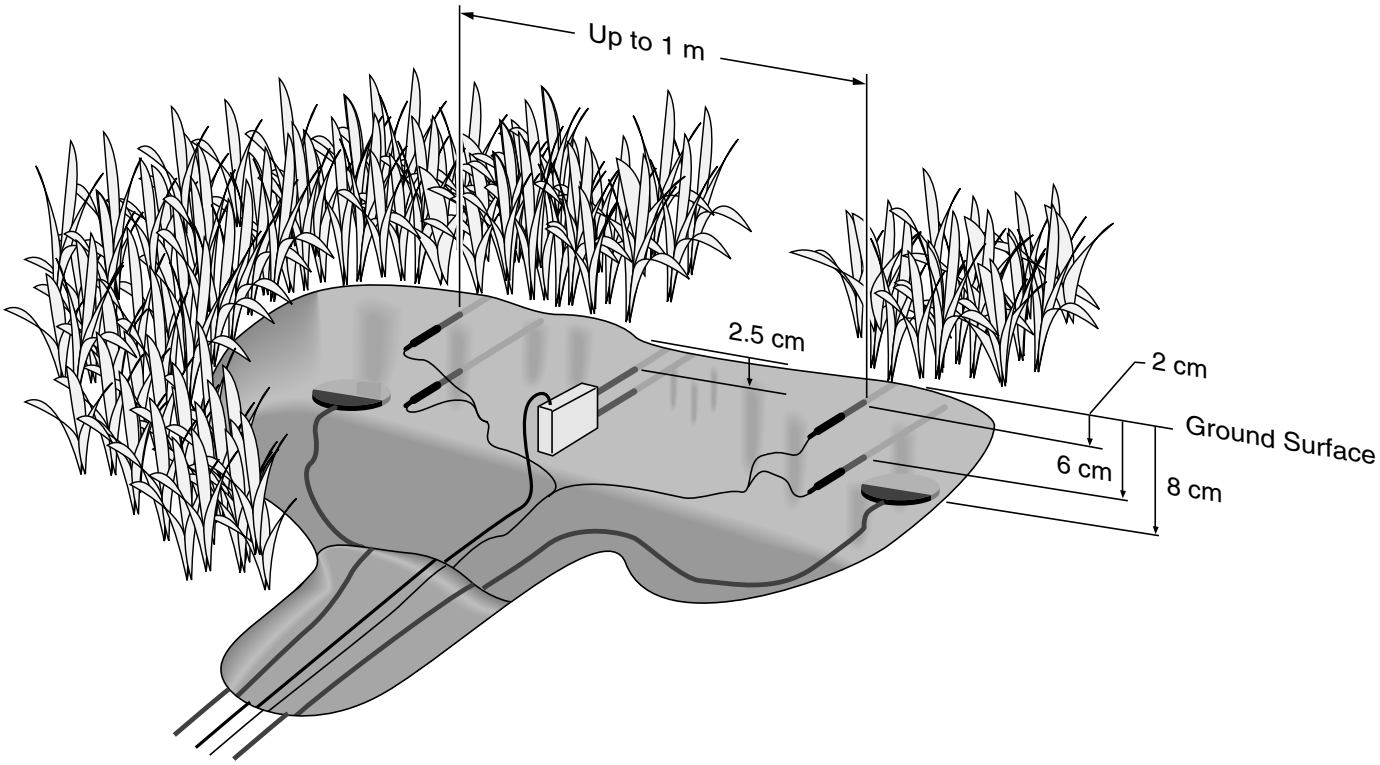
Both the HFP01 and HFP01SC provide soil heat flux measurements—typically for energy balance or Bowen ratio flux systems. These heat flux sensors are manufactured by Hukseflux (Delft, The Netherlands) for Campbell Scientific, and are compatible with most of our dataloggers. They are not compatible with our CR200(X)-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 HFP01SC Self-Calibrating Heat Flux Sensor is intended for applications requiring the highest possible degree of measurement accuracy.



The above illustration shows heat flux sensors installed with the CS616 and TCAV Averaging Soil Temperature Probes. All sensors must be completely inserted into the soil face before the hole is backfilled.

Ordering Information

Heat Flux Sensors

Recommended cable length is 25, 50, 75, or 100 ft (8, 15, 23, or 31 m).

HFP01-L Hukseflux Soil Heat Flux Plate with user-specified cable length; enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

HFP01SC-L Hukseflux Self-Calibrating Soil Heat Flux Plate with user-specified cable length; enter cable length, in feet, after the -L. Must choose a cable termination option (see below).

Cable Termination Options (choose one)

-PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.

-PW Cable terminates in a connector for attachment to a prewired enclosure.

-CWS HFP01 cable terminates in a connector for attachment to a CWS900 interface. Connection to a CWS900 interface allows the HFP01 to be used in a wireless sensor network. This option is only for the HFP01 (not the HFP01SC).



The HFP01 is for applications that do not require self calibration.

Specifications

Sensitivity (nominal): 50 µV W^{-1} m^{-2}

Nominal Resistance: 2 ohms

Temperature Range: -30° to +70°C

Plate Thickness: 5 mm (0.20 in.)

Plate Diameter: 80 mm (3.15 in.)

Weight (w/o cable): 200 g (7.05 oz)

HFP01

Sensor: Thermopile

Range: ±2000 W m^{-2}

Sensor Thermal Resistance: <6.25 x 10^{-3} Km^2 W^{-1}

Expected Typical Accuracy: within -15% to +5% in most common soils for 12-hr totals

HFP01SC

Sensor: Thermopile with film heater

Expected Accuracy: ±3% of reading

Heater Resistance: 100 ohms (nominal)

Heater Voltage Input: 9 to 15 Vdc

Heater Voltage Output: 0 to 2 Vdc

Duration of Calibration: ±3 minutes @ 1.5 Watts; typically done every 3 to 6 hours

Average Power Consumption: 0.02 to 0.04 W

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