

RADIATION AND ENERGY BALANCE SYSTEMS, INC. (REBS)
PO Box 40203, Bellevue, WA 98015 (206) 624-7221
HEAT FLOW TRANSDUCER (HFT-3.1)
INSTRUCTION MANUAL. REV. 3, 2/2004

Serial Number H073016 Date 2/21/07

Calibration factor 31.5 $Wm^{-2}mV^{-1}$

SPECIFICATIONS

Nominal calibration factor: $40 Wm^{-2}mV^{-1}$
Nominal resistance: 2 ohms
Nominal Size: 38.56mm diameter x 3.93mm thick
Thermal conductivity: $1.22 Wm^{-1}K^{-1}$
Cable: shielded 2-conductor, 7.6m long

INTRODUCTION

The heat flow transducer is designed to measure heat flow in soils. The thermopile is encapsulated in high thermal conductivity epoxy to prevent ground potential pickup. Additional features include: high output; low resistance; temperature independent; no power required; and linear calibration.

INSTALLATION

The heat flow transducer should be installed level in the soil. Make sure that there is good thermal contact between the soil and the top and bottom of the transducer. It is not advisable to place the transducer too close to the soil surface. This may impede moisture migration and the soil above it may dry quicker than adjacent soil. Resulting heat flow measurements would not be representative of the adjacent soil.

WIRING

The wiring convention is that the black wire is positive with respect to the other insulated wire when the transducer side with the white dot is on top and energy is flowing downward through the transducer.

COMPUTING HEAT FLOW

Heat flow is computed from the thermopile voltage (V_t) by:

$$HF(Wm^{-2}) = V_t(mV) * \text{calibration factor.}$$