



## Overview

The VU01, manufactured by Hukseflux Thermal Sensor, is a high-quality ventilation unit for use with pyranometers and pyrgeometers. Its purpose is to improve the dependability of the measurement. The measurement accuracy improves because the offsets are reduced. The reliability benefits from the prevention of dew and frost formation, as well as the quick

evaporation and sublimation of water and snow. ISO/TR 9901 "Solar Energy - Field Pyranometers - Recommended practice for use" recommends the use of ventilators where high accuracy and reliability are required. The VU01 is designed in agreement with the recommendations of ISO/TR 9901 and BSRN.

## Benefits and Features

- › Reduces zero offsets by promoting thermal equilibrium of all radiometer components
- › Prevents dew and frost formation
- › Optional heating promotes evaporation of water droplets and sublimation of snow
- › Removable dust filter
- › Meets recommendations of ISO/TR 9901 for required high accuracy and reliability

## Detailed Description

The VU01 uses a 7.8 W fan and inlet filter to draw clean air over the pyranometer's outer dome. The fan should operate continuously to reduce dust and dirt settling, to dissipate raindrops, and to stabilize the dome temperature.

The VU01 has dual 5 W heaters, which are used to raise the temperature of the dome slightly above ambient temperature and prevent the formation of dew and frost. Relays are recommended to control and source the appropriate power to the ventilator and heaters separately.

### Improved Measurement Dependability

Ventilation promotes thermal equilibrium between all components of radiometers, and thereby reduces zero offsets. Dew and frost formation is prevented. Additional heating will promote the evaporation of water droplets and sublimation of snow. It should be noted that heating in combination with pyranometers will lead to increased thermal offsets, so heating is only recommended if necessary.



Operation

Using the VU01 is easy. The footprint of the VU01 is small, which prevents accumulation of snow. The ventilator power is relatively high to increase the airflow. The ventilator is generally used continuously; the heater is typically controlled by the

data logger. Ventilation is typically used with high-accuracy measurement requirements. In such cases, the need for a high level of instrument maintenance and dome cleaning still exists; evaporating droplets of water might leave stains on the instrument domes. The bottom of the VU01 provides access to the removable dust filter.

Specifications

Compliance with Standards	ISO/TR 9901, BSRN operations manual
Rated Operating Power	7.8 W at 12 Vdc (unheated)
Rated Operating Voltage Range	10.8 to 13.2 V
Rated Operating Temperature Range	-40° to +70°C
Fan Status Signal	High/low output (optional use)
Heater	5 and 10 W at 12 Vdc (optional use)
Increase of Air Temperature	➤ 0.5°C at 0 W heating ➤ 1.0°C at 5 W heating ➤ 1.5°C at 10 W heating

Zero Offset A Reduction SR20	50% at 0 W heating
Offset SR20 by Heating	➤ -2 W/m <sup>2</sup> at 5 W heating ➤ -4 W/m <sup>2</sup> at 10 W heating
Offset IR20 by Heating	➤ 0 W/m <sup>2</sup> at 10 W heating ➤ 0 W/m <sup>2</sup> at 5 W heating
Cable Resistance	0.3 Ω/m (2 x 0.15 Ω/m)
Voltage Drop at 10 W Heating Power	0.12 V/m
Footprint Diameter	0.17 m (6.69 in.)
Maximum Cable Length	5 m (17 ft)
Sensitivity	➤ 5 and 10 W (at 12 Vdc for heater) ➤ 7.8 W (at 12 Vdc for vent)

