PFR19 Specification Sheet

Short Description

The Precision Filter Radiometer (PFR) is a research grade instrument to measure direct solar irradiance in 4 narrow spectral bands centered at wavelengths recommended by the World Meteorological Organization for the determination of atmospheric aerosol optical depth (AOD).
The PFR consists of an optical sensor head with signal amplifiers and an electronic box with power supply and data logger. Both units are designed for automated operation under harsh weather conditions when the sensor is mounted on a suitable solar tracker. The data logger communicates over a serial or Ethernet link with software available for Windows PC's and has a data storage capacity of 1 month.

The instrument was designed for radiometric stability. The detectors are operated in a controlled environment and are exposed to solar radiation only during actual measurements. A Peltier maintains the ion-assisted deposition filters and silicon detectors at a constant temperature of +25°C over an ambient temperature range from -20°C to +35°C. The default temperature of +25°C may be adjusted by ±5°C on request to accommodate local environmental temperature conditions. An internal shutter shades the detector between measurements and the vacuum tight sensor head is filled with dry nitrogen gas. The instrument has a built-in pressure sensor to allow tightness monitoring. An electronic pointing sensor plus a complementary set of housekeeping parameters, including an optional barometric sensor support evaluation and quality control of the measurements.

The PFR can be calibrated for spectral aerosol optical depth relative to the World Reference PFR Triad of the WMO operated by the PMOD/WRC.

PFR19 Head Specifications

Optical Specifications

Spectral characteristics

	CH1	CH2	CH3	CH4	unit
Standard Version N	862	500	412	368	nm
Special Version E	719	675	610	450	nm
Special Version F	1024	946	817	778	nm
FWHM bandwidth	5.0	5.0	5.0	5.0	nm

Please note that special versions will only be manufactured if enough orders are placed! Special versions are offered with limited calibration service only, please contact PMOD/WRC for further details.

Field of view	opening angle 2.5° slope angle 0.7°
Entrance Window	3mm fused silica
Pointing Monitor	±0.75° in two axes

Mechanical Specifications

Instrument Dimension	Ø x L: 88x390mm
Instrument Mass	3.0 kg

Electrical Specifications

Supply Voltage	+/-12VDC
Maximal Current Draw	2A

PFR19 Electronic Box Specifications

Mechanical Specifications

Control Box Dimension	H x L x W: 300x300x150mm
Control Box Mass	10.0kg + cables
Cables	10m PTFE instrument cable 10m PUR power cord 10m PUR RS232 cable 10m PTFE Ethernet Cable

Electrical Specifications

Power Supply Type	Low Noise Linear Power Supply
Power Supply Voltage	+/-12V
Power Supply Output Current	3A
Power Supply Power	80W
Power Supply Efficiency	55%
Power Supply Input Voltage	230VAC, 50Hz*
Data Logger	Campbell Scientific CR1000X
Serial Data Link	RS232C, 9600bd, 8/1/0 bits
Ethernet	10/100MBps
Instrument cable	Teflon isolation, UV resistant

**110VAC, 60Hz is available on request*

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