

Precision Filter Radiometer

Short Description
Pricelist 2011



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 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 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 thermostat maintains the ion-assisted deposition filters and silicon detectors at a constant temperature of $20.5 \pm 0.1^\circ\text{C}$ over an ambient temperature range from -20°C to $+35^\circ\text{C}$; 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. At PMOD/WRC, the PFR spectral characteristics and radiometric sensitivity can be calibrated against an absolute trap detector traceable to a primary cryogenic radiometer at Physikalisch-Technische Bundesanstalt, Berlin.

An electronic pointing sensor plus a complementary set of housekeeping parameters, including an optional barometric sensor support evaluation and quality control of the measurements.

PFR Specifications

Optical: 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

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:

Instrument dimension	Ø x L: 89 x 390mm
Instrument mass	3 kg
Control box dimension	H x L x W: 300 x 250 x 160 mm
Control box mass	8.250 kg + cables
Cable length	standard 10 m instrument cable (max. 12.5m) < 30m to PC and mains

Electrical:

Power requirement	85 ... 264 VAC, 40..400 Hz, 20 W max
Data Logger	Campbell Scientific CR1000
Serial data link	RS232C, 9600bd, 8/1/0 bits
Ethernet (optional)	Campbell Scientific NL115 option
Instrument cable	Teflon isolation, UV resistant

Software:

Data Logger	PC200W Starter S/W (free download at Campbell Scientific Inc.)
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Standard Devices	Price CHF
PFR-N, Std. wavelengths	16'380
PFR-E, -F special wavelengths	19'950
Electronic box w. power supply and CR1000 data logger incl. 10m Teflon cable, 30m RS232 cable, 30m mains cable	7'520
Options	
Barometric pressure sensor (Setra)	1'300
Ethernet Interface Campbell NL120	530
Mounting flange for 2 instruments on INTRA tracker	580
Transport case for complete system	255
Instrument case for PFR only	330
Calibrations	
Calibration by comparison to WORCC standard	900
Radiometric calibration by FEL standard lamp	1'200
Administration and handling fee (for calibration orders)	60

Above prices are in Swiss francs, excluding VAT (applicable for Switzerland), shipment costs, local taxes and custom duties.

Date of delivery

The PFR instruments are built in small lots. For availability and date of delivery please contact PMOD/WRC.

If the order includes optional calibrations by comparison method, which requires multiple days of continuous sunshine, the date of delivery may shift depending on local weather conditions at Davos.

Terms of warranty

PMOD/WRC warrants these products to be free from defects in material and workmanship for a period of 18 months from date of shipment.

This warranty does not cover defects resulting from product modifications by the customer without explicit written consent by PMOD/WRC. This warranty is neither applicable to any software delivered with the product nor to normal wear and tear or damage induced by external events like fire, flooding, earthquake etc.

Terms of payment

For new customers we request 50 % advance payment before the goods are shipped. Please note that the goods can only be delivered upon receipt of the advance payment. The remainder should be paid within 30 days after receipt of the final invoice.

Invoice currency is CHF.