



MIDDLETON SOLAR



SP02 and SP02-L SUNPHOTOMETER

Compact Instrument for Spectral Optical Depth Measurement



The Middleton Solar SP02 Sunphotometer is a simple low-cost instrument for the determination of the spectral optical depth of the atmosphere. It can be configured for optical depth measurement, column ozone measurement, and assessment of water vapour. It consists of four precision spectroradiometers axially aligned in a sealed enclosure. The SP02-L version has a longer body with a narrower field of view to reduce light scatter from the sun aureole in locations that have a high aerosol load, such as northern Europe.

Performance Specification	SP02	SP02-L
field of view	5.0° (2.5° opening angle)	2.5° (1.25° opening angle)
slope angle	1.6°	0.7°
limit angle	3.5°	1.8°
output signal x 4 channels	-0.05 to +4.5 VDC max.	
resolution	<0.005OD (Langley method)	
response time	0.2s to 99%	
operating temperature	-30°C to +70°C	

EXCELLENT STABILITY, COMPACT, RELIABLE

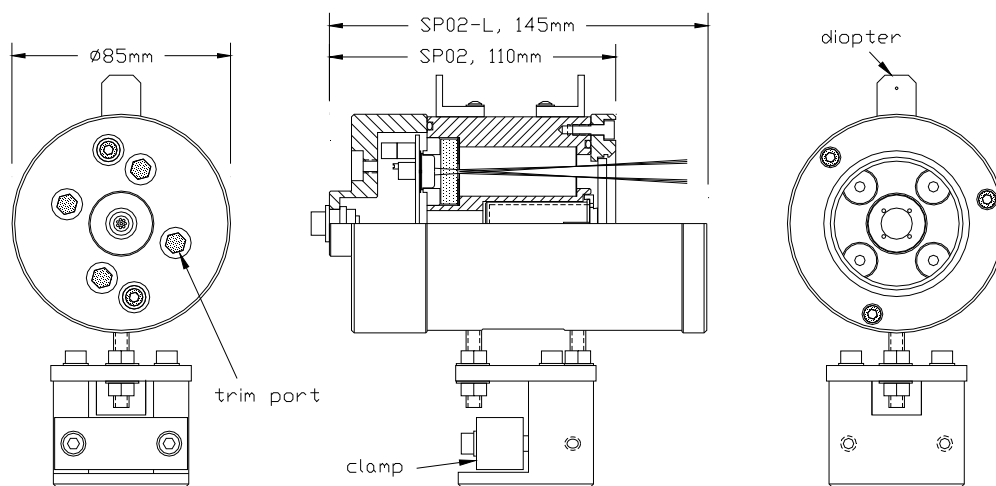
Four channels operate simultaneously.

Large Ø25mm interference filters for long-term stability.

Negligible temperature error.

Excellent Optical Depth resolution.

Middleton Solar SP02 & SP02-L Sunphotometer. Detailed Specification



Compact and light-weight.
Moderate power requirement.
Core temperature output provided.
Low-noise signal amplifiers with negligible drift.
External gain trim for each channel (via rear access ports).
Anodized marine-grade aluminium, and stainless steel.
Negligible temperature error, in the range 350-930nm, due to: <ul style="list-style-type: none"> - Si-photodiode detector used has a thermal coefficient of zero in this range; - Interference filters used have very small thermal coefficients (0.016-0.023nm/°C).
Can be mounted directly to Middleton Solar AST-02 and AST-02 Active Solar Trackers.

General Specification

standard filters: center wavelength (10nm bandpass interference type)	aerosol version: 412, 500, 675, 862nm ozone version: 368, 500, 610, 778nm water vapour version: 500, 778, 812, 862nm
cavity, size; CWL tolerance	3-cavity, Ø25mm; ±2nm
side-band blocking	OD5, UV to 1,200nm
filter non-stability (per year)	-2% (typical)
detector type; active area	UV si-photodiode; 33mm ²
sensitivity gain setting x 4 channels	high/low by jumper; trim via multi-turn pot
power supply requirement	5.5 to 14.5VDC, 20mA
temperature output	10mV/°C (0.20V = 20°C)
desiccant	non-toxic silica gel (visible thru front window)
interface lead	5m, 8-core shielded cable. IP68 plug at instrument end, free end unterminated
mounting method	Ø25mm (1") female clamp, with adjustable alignment
weight (excluding 0.5Kg lead)	1.25kg (SP02); 1.75kg (SP02-L)

Available options:

- Low temperature interface lead, -55°C
- Alternative filters in the range 350 to 930nm, 5 or 10nm bandpass