



VSF

WET Labs offers a line of optical tools for determination of bio-optical and physical parameters within natural waters. These instruments are designed as a modular suite of sensors with special features for specific application support. The *Environmental Characterization Optics (ECO)* series incorporates a common set of options with a single basic design to make the sensors ideal for a wide variety of deployments. Features include:

- Compact size
- Optional integrated anti-fouling
- Integrated self-logging
- High precision and stability
- Configurable output

The VSF uses three transmitters coupled to a single receiver to obtain the angular distribution of scattered radiation in the backward hemisphere. VSF data is used in the interpretation of remote sensing measurements, investigations of particle shape, and models of visibility in water. The **ECO-VSF** measures the optical scattering at three distinct angles: 100, 125, and 150 degrees, providing the shape of the Volume Scattering Function (**VSF**) throughout the backscattering region. Motivated by the need to better understand the relationship of water-leaving radiance with the backscattering into the same direction, the three-angle measurement allows determination of specific angles of backscattering through interpolation and extrapolation. It also provides the total backscattering coefficient by integration and extrapolation from 90 to 180 degrees.





ECO VSF Specifications

ECO-VSF(RT)—Provides an RS-232 serial output with 4000-count range. This unit is programmably configurable for continuous operation.

ECO-VSF—(Standard configuration) Provides an RS-232 serial output with 4000-count range. This unit is programmably configurable for continuous operation or periodic sampling.

ECO-VSFS—Provides the capabilities of the VSF with an integrated anti-fouling *bio-wiper*[™].

ECO-VSFB—Provides the capabilities of the VSF and self-recording with internal batteries for autonomous operation.

ECO-VSFSB—Provides the capabilities of the VSF with an integrated anti-fouling *bio-wiper*[™] and self-recording with internal batteries for autonomous operation.

Mechanical

<i>Diameter</i>	6.3 cm (standard)
<i>Length</i>	12.7 cm (standard)
<i>Weight in air</i>	0.4 kg (standard)
<i>Weight in water</i>	0.02 kg (standard)
<i>Pressure housing</i>	Acetal copolymer

Optical

<i>Wavelength</i>	470, 532, or 660 nm
<i>Sensitivity</i>	1.24×10^{-5}
<i>Range, typical</i>	$\sim 0.0012\text{--}5 \text{ m}^{-1}$
<i>Linearity</i>	99% R^2

Environmental

<i>Temperature range</i>	0–30 deg C
<i>Depth rating</i>	600 m (standard)
<i>Pressure/temperature sensor</i>	optional

Electrical

<i>Digital output resolution</i>	12 bit
<i>RS-232 output</i>	19200 baud
<i>Analog output signal</i>	0–5 V
<i>Internal data logging</i>	optional
<i>Internal batteries</i>	optional
<i>Connector</i>	MCBH6M
<i>Input</i>	7–15 VDC
<i>Current, typical</i>	85 mA
<i>Current, sleep</i>	80 μ A
<i>Data memory</i>	50,000 samples
<i>Sample rate</i>	to 8 Hz
<i>Anti-fouling bio-wiper</i> [™]	optional
<i>Bio-wiper</i> [™] cycle	optional

Specifications subject to change without notice.



ECO-VSF

Specifications Sheet

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Revision History

Revision	Date	Revision Description	Originator
A	02/14/00	Begin revision control	H. Van Zee
B	04/12/00	Update spec (DCR 22)	W. Strubhar
C	10/31/00	Add VSFSB (DCR 68)	H. Van Zee
D	2/19/01	Update text (DCR 87)	H. Van Zee
E	11/5/01	Change LED wavelength values (DCR 159)	H. Van Zee
F	1/23/02	Remove "new" reference (DCR 190)	H. Van Zee
G	3/13/02	Correct weight of VSFS/VSFB (DCR 201)	H. Van Zee
H	4/16/02	Add max. samples (DCR 215)	D. Whiteman
I	7/8/02	Add battery option to spec table (DCR 228)	H. Van Zee
J	2/24/03	Replace "shutter" with "bio-wiper™" (DCR 280)	H. Van Zee
K	11/24/03	Change specs to round board meter type (DCR 338)	H. Van Zee
K1	6/16/04	Update specifications	H. Van Zee, I. Walsh
L	6/29/04	Updates approved (DCR 400)	H. Van Zee, I. Walsh
M	9/26/06	Update specifications (DCR 507)	M. Johnson