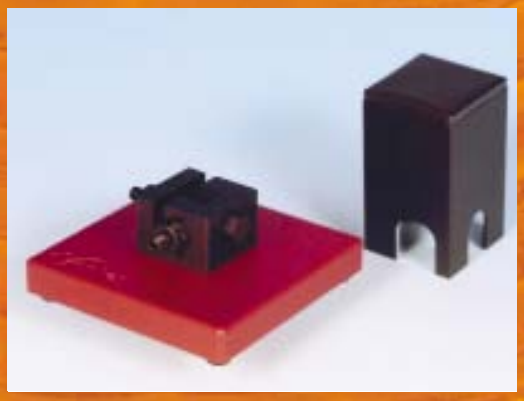
Accessories



Introduction

A complete program for fiber optic SMA 905 coupled sampling accessories is available from Avantes. The sampling accessories can be divided into different categories, depending on the intended application:

- Cuvette holders, available in 4 different types:
  - Standard 10 mm optical path length for UV/VIS/NIR absorption measurements
  - 10 mm path length with one side port under 90 degrees for fluorescence applications
  - 10 mm path length with 2 light paths for dual channel spectroscopy and fluorescence measurements.
  - Variable path length 0-100 mm for strong absorption or low absorption measurements.
  - Direct attached cuvette holders to connect directly to SMA-coupled light sources. These cuvette holders are specially usefull for fluorescence applications.

- Integrating spheres, available in 2 types:
  - Irradiance for measuring radiometric and photometric quantities of LED's and other light sources.
  - Reflection for measuring color parameters of object surfaces, such as L, a, b, hue, Chromaticity

- Inline filter holders and TTL-controlled shutters
- Inline fiber optic attenuator
- Fiber Optic Mutiplexer
- Optical table mounts for collimating lenses, as presented under fiber optic accessories.

- Flow cells for different types of applications:
  - In-line absorption measurements and process control 1/2" and 1/4" with 5/10mm path length.
  - Micro-flow cells for low volume, high pressure and HPLC applications.
  - Long path flow cells for very low-absorption measurements.

- White reflective material to be used as a reference material for reflection measurements (for example color applications)

Cuvette Sample Holders

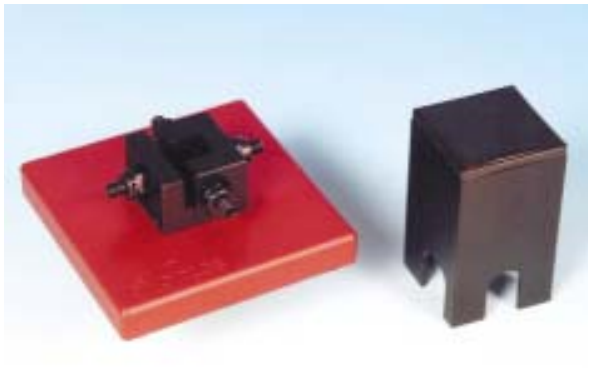
The CUV-UV/VIS, CUV-FL-UV/VIS and CUV-ALL-UV/VIS cuvette sample holders are designed for transmission/fluorescence measurements using a 10 x 10 mm cuvette. It features adjustable clamping to hold non-uniform cuvettes at a repeatable location. All cuvette sample holders have a 5 mm wide slit for filters and a cover to prevent ambient light entering the light path.

The CUV-UV/VIS comes with 2 collimating lenses with adjustable focus to maximize the light throughput. The CUV-FL-UV/VIS has 2 collimating lenses, under 90 degrees for fluorescence measurements, the other 2 ports have a mirror. The CUV-ALL-UV/VIS has 4 collimating lenses, all COL-UV/VIS in 2 optical paths.

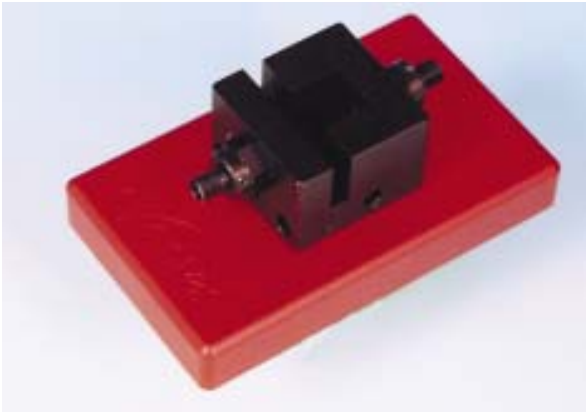
For the various cuvette holders different cuvettes can be ordered, the CUV-10-2 for the standard CUV-UV/VIS cuvette holder. The CUV-10-4 has 4 optical windows and is useful for fluorescence or 2- way measurements, as done with the CUV-FL-UV/VIS or the CUV-ALL-UV/VIS.

All cuvette holders can be used in the UV/VIS and NIR range.

CUV-ALL-UV/VIS



CUV-UV/VIS



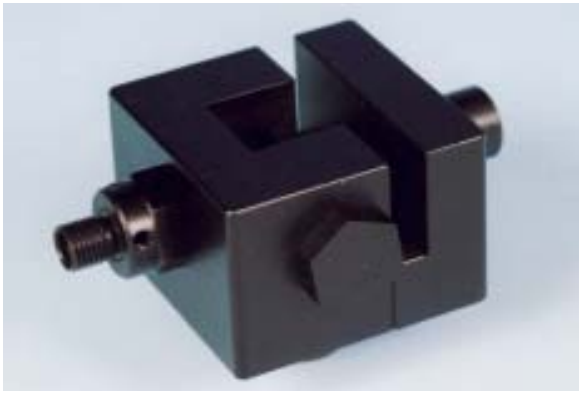
Technical Data

	CUV-UV/VIS	CUV-FL-UV/VIS	CUV-ALL-UV/VIS
Cuvette Dimensions	10 x 10 mm		
Fiber connection	2 x COL-UV/VIS, SMA	2 x COL-UV/VIS, SMA, 2 mirrors	4 x COL-UV/VIS, SMA
Filter slit	Max 5 mm wide		
Overall dimensions	100 x 60 x 40 mm	100 x 100 x 40 mm	
Cover	Black anodized aluminum with black PE insert, 45 x 45 x 80 mm		

ORDERING INFORMATION	
CUV-UV/VIS	Cuvette Holder, 10 mm path, incl. 2 UV/VIS/NIR lenses and cover
CUV-FL-UV/VIS	Fluorescence Cuvette Holder, 10 mm path, incl. 2 UV/VIS/NIR lenses under 90° and cover
CUV-ALL-UV/VIS	Cuvette Holder 10 mm path, 2 beams, 4 x UV/VIS/NIR lenses and cover
CUV-10-2	Quartz Cuvette 10 mm, 2 windows, 3,5 ml
CUV-10-4	Quartz Cuvette 10 mm, 4 windows, 3.8 ml

CUV-DA Direct Attachment Cuvette Holder

CUV-DA-UV/VIS

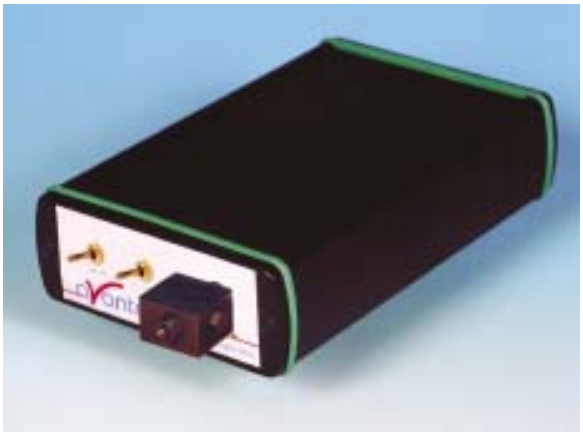


The CUV-DA-UV/VIS direct attachment cuvette holder can be easily coupled to all our fiber optic light sources. The CUV-DA-UV/VIS can be used for absorbance and fluorescence measurements. It comes with two 90 degree and a 180 degree 3/8"-24 thread that allows the COL-UV/VIS collimating lens to be mounted for absorbance or fluorescence setups.
Two SiO_2 coated aluminum mirrors with 3/8"-24 thread screw are delivered with the CUV-DA-UV/VIS to mount in the other thread, to make the fluorescence signal even stronger.

The CUV-DA-UV/VIS also has a 5 mm wide filter slot.

For most of the AvaLight light sources special direct attach cuvette holders are available (see ordering information) that can be mounted directly on the front panel of the light source instead of the standard filter holder.

Avalight-DHc with CUV-DHc



Technical Data

	CUV-DA-UV/VIS	CUV-DHc	CUV-DHS	CUV-HAL
Wavelength range	200-2000nm			
Cuvette Dimensions	10 x 10 mm			
Light source connection	Ferrule	SMA thread	Mounting plate	Mounting plate
Fiber connection	1 x COL-UV/VIS, SMA 905 connectors			
Fluorescence mirrors	2 x SiO_2 coated aluminum mirrors			
Filter slit	Max 5 mm wide			
Dimensions	60 x 43 x 28 mm		60x 50 x 50mm	60x 35 x 35mm

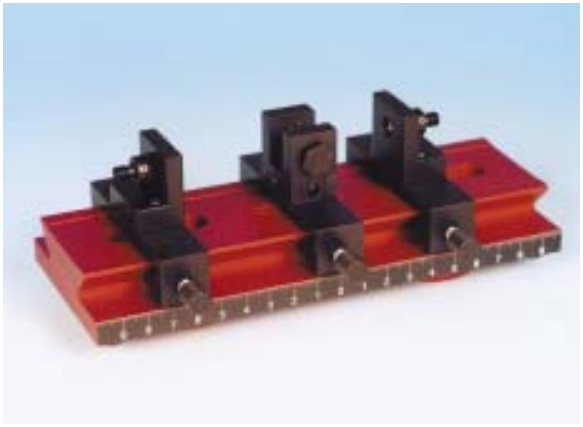
ORDERING INFORMATION	
CUV-DA-UV/VIS	Direct attachment 10 mm Cuvette Holder incl. COL-UV/VIS lens and 2 mirrors
CUV-DHc	Direct attach 10 mm cuvette holder for AvaLight-DHc incl. COL-UV/VIS lens and 2 mirrors
CUV-DHS	Direct attach 10 mm cuvette holder for AvaLight-D(H)-S incl. COL-UV/VIS lens and 2 mirrors
CUV-HAL	Direct attach 10 mm cuvette holder for AvaLight-HAL(S) incl. COL-UV/VIS lens and 2 mirrors
CUV-10-4	Quartz Cuvette 10 mm, 4 windows, 3.8 ml

Variable Pathlength Cuvette Holder

The CUV-VAR-UV/VIS cuvette holder with variable path length is designed for low absorption measurements and for flow cells. The variable path length enables optimal flexibility to use it either as a standard cuvette holder with 10 mm path length or to use it as a filter holder with 2 mm path length or enables the user to create a path length up to 160 mm.

The CUV-VAR-UV/VIS comes with a base plate as in the CLH-VAR-UV/VIS and is standard equipped with 2 COL-UV/VIS lenses for applications in the 200-2000 nm range.

CUV-VAR-UV/VIS



Technical Data

Base Dimensions (L x W x H)	200 x 80 x 25 mm
Fiber connection	2 x COL-UV/VIS, SMA connectors
Optical path	0-160 mm
Cuvette holder insert	Optical path 20 mm for 10 mm cuvettes
Focal height	26 mm from base plate
Overall dimensions (L x W x H)	200 x 96 x 62 mm

ORDERING INFORMATION	
CUV-VAR-UV/VIS	Cuvette Holder with variable 0-100 mm path, incl. 2 COL-UV/VIS collimating lenses

Integrating Spheres

Integrating spheres generally function as a light collector. The collected light can be used as a diffuse illumination source or as a measurement source. In the Avantes line of integrated spheres the spheres are mostly used as measurement source. The basic principle of operation is that light enters the integrating sphere through the sample port, goes through multiple reflections and is scattered uniformly around the interior of the sphere. The detection fiber optics are SMA-coupled to the port at the side of the sphere which is viewing illumination on a baffle, independent of the angular properties of the light at the sample port. The baffle prevents first reflections to enter the detection fiber.

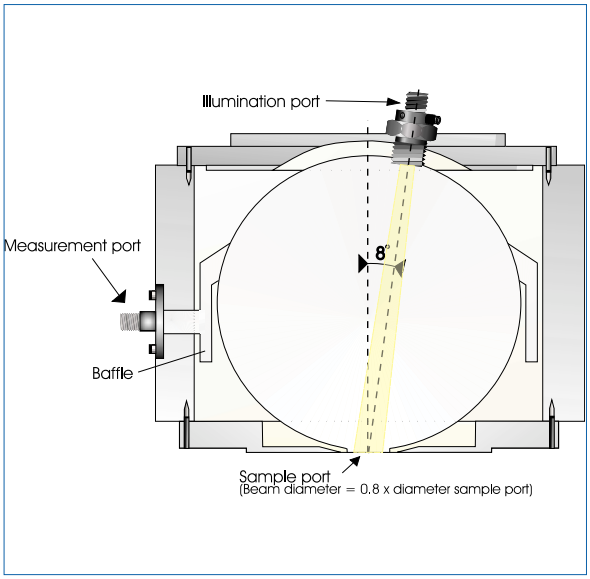
The AvaSphere integrating sphere family can be delivered with an active diameter of 30, 50 or 80 mm and an SMA port at 90 degrees for irradiance and reflection measurements. The reflection sphere has an additional SMA- connector port at 8 degrees, for direct illumination, coupling the light into the sphere through a fiber and a COL-UV/VIS collimating lens, connected to a light source. The AvaSphere-30 has a sample port diameter of 6 mm, the AvaSphere-50 10 mm and 15 mm for the 80 mm diameter sphere.

All sample ports are knife-edge, this ensures 180 degree field of view of the sample port. The irradiance version of the integrating sphere can be used to measure light sources (Laser, LED, and Halogen Lamps). For the irradiance measurements of LED's a special adapter was developed to be connected to the AvaSphere-50/80-IRRAD. The adapter can hold 3, 5 and 8 mm LED's in the correct and reproducible position inside the sphere.

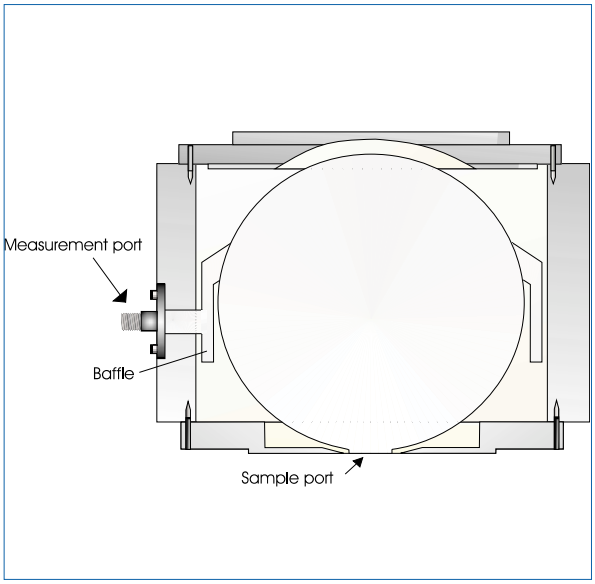
The reflection version is used to measure total integrated reflectance of a surface, as well as for color measurement and fluorescence spectroscopy. The measurement principle is based on direct illumination and indirect reflection. A light source may be connected to the 8 degree SMA-connector port through a fiber optic bundle to make the integrating sphere an ideal uniform light source. The inside of the integrating sphere is made out of highly reflective diffuse material; that gives a light diffuse reflection (>96 %) over a wide wavelength range (250-2500 nm). A special black gloss-trap is available for the AvaSphere-50-REFL reflection sphere to exclude specular reflection in the measurement. This option needs to be ordered together with the sphere. In case specular reflection needs to be included, a white reflective part can be mounted in the position of the gloss trap.

AvaSpheres 30-REFL and 50-REFL

Reflection integrating sphere

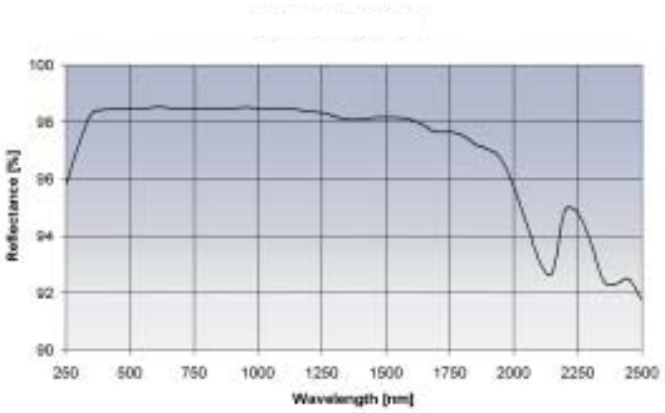


Irradiance integrating sphere

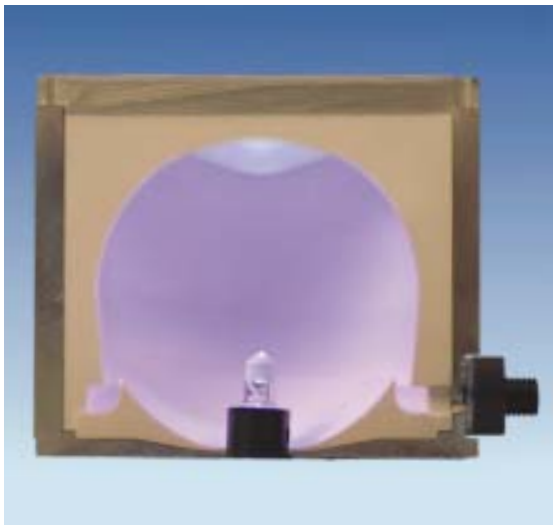


Accessories

Reflection curve AvaSphere



LED measurement



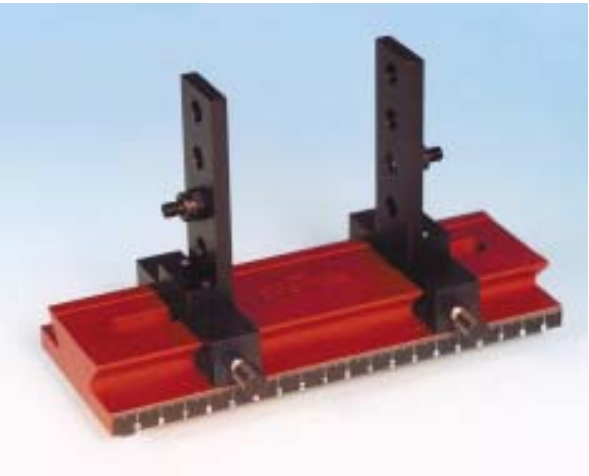
Technical Data

	AvaSphere-30	AvaSphere-50	AvaSphere-80
Internal diameter (mm)	30	50	80
Sample port diameter (mm)	6	10	15
External Dimensions	59.5 mm diameter 40 mm height	69.5 mm diameter 60 mm height	109 mm diameter 95 mm height

ORDERING INFORMATION	
AvaSphere-30-IRRAD	Integrat. Sphere 30mm for light measurements (250-2500nm), Sampleport 6 mm
AvaSphere-50-IRRAD	Integrat. Sphere 50mm for light measurements (250-2500nm), Sampleport 10 mm
AvaSphere-80-IRRAD	Integrat. Sphere 80mm for light measurements (250-2500nm), Sampleport 15 mm
AvaSphere-30-REFL	Integrat. Sphere 30mm for reflection (250-2500nm), Sampleport 6 mm , 2 SMA port
AvaSphere-50-REFL	Integrat. Sphere 50mm for reflection (250-2500nm), Sampleport 10 mm , 2 SMA port including AvaSphere-GT50-W
AvaSphere-80-REFL	Integrat. Sphere 80mm for reflection (250-2500nm), Sampleport 15 mm , 2 SMA port
AvaSphere-LED-ADR	Cylindrical Adapter to hold 3, 5, 8 mm LED's inside the AvaSphere-50-IRRAD
AvaSphere-LED-ADR-80	Cylindrical Adapter to hold 3, 5, 8 mm LED's inside the AvaSphere-80-IRRAD
AvaSphere-GT50	Optional Gloss Trap for AvaSphere-50-REFL, coated with black absorbing material. Only in combination with AvaSphere-50-REFL.
AvaSphere-GT50-W	Gloss Trap coated with white material to include specular reflection. Standard included in AvaSphere-50-REFL.

Variable Collimating Lens Holder

CLH- VAR-UV/VIS



The variable Collimating Lens Holder is an assembly for mounting lenses at multiple positions, and is useful for transmission measurements of large or thick samples not easily accommodated by other sampling optics.

The lens holder has an anodized aluminum base and adjustable mount bars. Each bar has four 3/8-24 threaded holes for collimating lenses. The bars can be adjusted at the base by loosening the screws to accommodate samples up to about 160 mm thick.

Two COL-UV/VIS Collimating lenses are included in the product

Technical Data

	Base	Mounting bars
Dimensions	200 x 80 x 25 mm Total height 120 mm	35 x 7 mm thick
Threads	n.a.	4 holes 3/8"-24, 20 mm apart
Collimating lenses	n.a.	2 COL-UV/VIS

ORDERING INFORMATION	
CLH-VAR-UV/VIS	Variable Collimating Lens Holder, including 2 COL-UV/VIS lenses

Optical Post Mount

The OPM Optical Post Mount consits of a base, a post and a lens holder. The lens holder is an M6 threaded anodized aluminum assembly with an 3/8”-24 hole for mounting collimating lenses. The OPM allows easy mounting on breadboard laboratory tables, rail carriers and other bench plates. The OPM is 30 mm in diameter and 6,5 mm thick.
The height of the focusing axis is 100 mm; the diameter of the base is 25 mm.

ORDERING INFORMATION	
OPM	Optical Post Mount, no lenses included

Fiber Optic Switch

The In-line Fiber Optics Switch (FOS) was developed for applications and setups where an automatic save-dark (1 light path) or correct for drift (2 light paths) needs to be performed. The manual or TTL electronic controlled shutter is available in the one (FOS-1-inline) or two (FOS-2-inline) light path version.

The FOS typically couples between 2 SMA terminated fibers and consists of 2/4 UV/VIS/NIR collimating lenses and a filter holder for 5 mm thick filters.
The TTL signals are provided by the AvaSpec spectrometer (IC-DB15-2 needed).

The AvaSoft full software (version 6.2 and higher) supports the correct for drift option for a setup where one of the FOS-2 channels is connected to do a reference measurement (e.g. white tile or cuvette with blank) and the other to do the sample measurement. The long term system drift (lamp or spectrometer, influenced by e.g. temperature is compensated by periodically switching to the reference channel, and using the (changes in) reference data to correct the data measured at the sample channel.
The FOS needs an extra PS-24V/1.25A 24 VDC power adapter.

FOS-2-Inline

NEW

Technical Data

Wavelength range	200-2000nm
Fiber connection	2 or 4 SMA 905 connectors, incl. 2 or 4 COL-UV/VIS collimating lenses
Filter slit	Max. 5 mm wide
Shutter frequency	Max. 5 Hz
Shutter attenuation	60 dB
Material	Black anodized aluminum
Dimensions	130 x 65 x 65 mm

ORDERING INFORMATION	
FOS-1-Inline	In-line Fiber Optic Switch, one optical path, incl. 2 COL-UV/VIS
IC-DB15-2	Interface cable AvaSpec to FOS-1-inline, 2m
FOS-2-Inline	In-line Fiber Optic Switch, 2 optical path, incl. 4 COL-UV/VIS
IC-DB15-FOS2-2	Interface Y-cable, AvaSpec to FOS-2 and AvaLight-S, 2m

In-line Fiber Optic Attenuator

The variable in-line attenuator was developed for applications and setups where too much light is a problem and the spectrometer detector can be saturated. The attenuator is typically couples between 2 SMA terminated fibers and consists of 2 UV/VIS/NIR collimating lenses and a rotating iris.

The attenuation can be set from 0-100% and fixed with a set screw.

The in-line attenuator is most efficiently mounted in the light source leg of a setup, where large core diameter fibers or bundles are used.

FOA-Inline

NEW

Technical Data

Wavelength range	200-2000nm
Attenuation	0-100%
Fiber connection	2 SMA 905 connectors, incl. 2 COL-UV/VIS collimating lenses
Material	Black anodized aluminum
Dimensions	57 x 25 x 25 mm

ORDERING INFORMATION	
FOA-Inline	In-line Fiber Optic Attenuator, 0-100%, SMA connectors

Accessories

Variable In-Line Filter Holder

For applications where the light between two fibers needs to be filtered the in-line filter holder is available. The in-line filter holder has an outside diameter of only 20 mm and can hold round filters of up to 12 mm diameter and 1-8 mm thick.

The in-line filter holder comes with 2 quartz collimating lenses for the UV/VIS/NIR range.

A wide range of round 12 mm filters can be supplied with the filter holder, see specifications in following table.

FH-Inline-UV/VIS-VAR

Technical Data

Wavelength range	200-2000nm
Filter Dimensions	Round, 12 mm diameter, 1-8 mm thick
Fiber connection	2 SMA 905 connectors
Material	Black annodized aluminum
Dimensions	50 x 20 mm

Separate round 12 x 3mm filters to install in FH-Inline

GL-WG305-3-12	Separate 12 x 3 mm long-pass filter > 305 nm
GL-KG3-3-12	Separate 12 x 3 mm bandpass filter, transparent > 325 nm and < 700 nm
GL-BG28-3-12	Separate 12 x 3 mm bandpass filter, transparent > 360 nm and < 500 nm
GL-GG385-3-12	Separate 12 x 3 mm long-pass filter > 385 nm
GL-GG475-3-12	Separate 12 x 3 mm long-pass filter > 475 nm
GL-OG515-3-12	Separate 12 x 3 mm long-pass filter > 515 nm
GL-OG550-3-12	Separate 12 x 3 mm long-pass filter > 550 nm
GL-OG590-3-12	Separate 12 x 3 mm long-pass filter > 590 nm
GL-NG9-1-12	Separate 12 x 1 mm Neutral Density filter
GL-NG9-2-12	Separate 12 x 2 mm Neutral Density filter
GL-NG9-3-12	Separate 12 x 3 mm Neutral Density filter

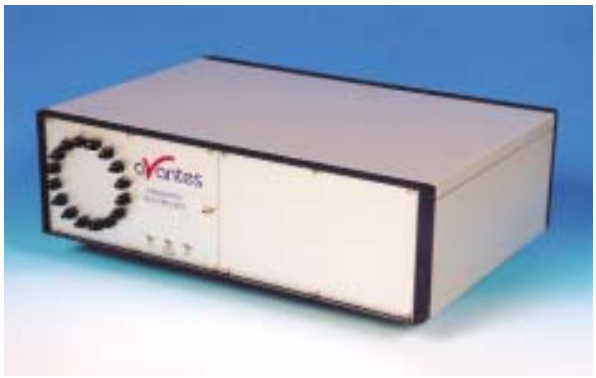
More filter types available, please contact us for ordering information.

ORDERING INFORMATION	
FH-Inline-UV/VIS-VAR	In-line Filter Holder for 12 mm diameter filters 1-8 mm thick, incl. UV/VIS collimating lenses

Fiber Optic Multiplexer

The Fiber Optic Multiplexer is an instrument that can optically couple 1 input channel to 8 or 16 different output channels. The multiplexer consist of a precisely controlled stepper motor and a rotator block. The optical path is coupled through multiple COL-UV/VIS collimating lenses.
The Fiber Optic Multiplexer is software controlled and interfaces to a PC through the RS-232 protocol. The software enables full control of the switching order, switching time and delay time. The multiplexer is also available as 2 input and 8 output version. Applications can be found in process industry, where multiple locations need to be measured with multiple probes, all with one spectrometer channel and/or light source .
The Multiplexer can work as a stand-alone unit for which a sample program is included. The FOM-DLL can be ordered to implement the FOM in your own software. The AvaSoft-FOM application add-on software is available to integrate the FOM into the AvaSpec spectrometers.

FOM-UV400-1x16



Technical Data

Multiplex Channels	1 x 16 or 2 x 8
Optical Throughput	> 60 % (based on 400 µm fibers)
Wavelength Range	200-800 nm (UV/VIS) or 350-2000 nm (VIS/NIR)
Fibers	Standard max. 400 µm, different dimensions available on request
Connectors	All SMA 905
Optical Repeatability	> 99%
Switching Time	< 60 ms between adjacent positions
Interface	RS-232
Power Requirement	230 VAC, 2A (fused) maximum or 110 VAC
Dimensions	129 (3HE) x 213 (42TE) x 315 (D) mm in 19" Rack mount

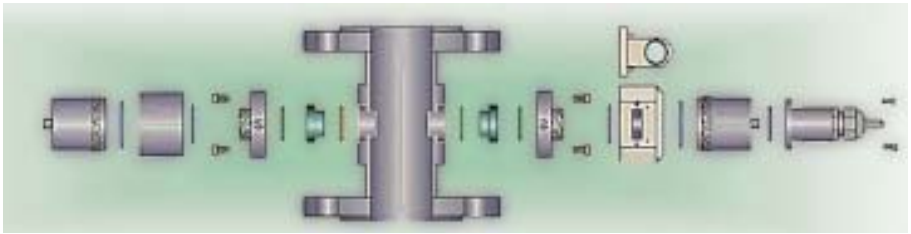
ORDERING INFORMATION	
FOM-UV400-1x16	Fiber Optic Multiplexer, 1 x 16 channels, 400µm UV /VIS, please specify 110 or 230 VAC
FOM-UV400-2x8	Fiber Optic Multiplexer, 2 x 8 channels, 400µm UV /VIS, please specify 110 or 230 VAC
FOM-IR400-1x16	Fiber Optic Multiplexer, 1 x 16 channels, 400µm VIS /NIR, please specify 110 or 230 VAC
FOM-IR400-2x8	Fiber Optic Multiplexer, 2 x 8 channels, 400µm VIS / NIR, please specify 110 or 230 VAC
Optional	
AvaSoft-FOM	Fiber Optic Multiplexer add-on Software, to integrate AvaSoft-Full with the Fiber Optic Multiplexer, to be ordered with AvaSoft-FULL
FOM-DLL	Interface DLL diver package for Fiber Optic Multiplexer (FOM-XX400-1x16 and FOM-XX400-2x8) for Windows-95/98, 2000, ME, NT, XP

Fiber Optic Process Flow Cells

The Fiber Optic Process Flow Cells (FOPFC) are developed for in-line absorbance measurements. The Process flow cells are available with different optical path lengths and can be easily coupled to our comprehensive line of fiber optic cables and bundles through SMA connectors.
The FOPFC is comprised of the sensor body, emitter focusing optics and receiver focusing optics assemblies to couple to fiber bundles with industry-standard SMA connectors, linking the process to the spectrometer. The FOPFC has a modular design, standard process flange connections and is optimized for use in harsh environment with high temperatures and high pressures. SMA connector protection caps are available on request.

Technical Data

Materials	316Ti Stainless Steel , 316L Stainless Steel, TFMC (carbon-filled Teflon®), Kynar®, PEEK, Monel®, Hastelloy C®, Inconel®, Tantalum, Titanium
Process Connections	ANSI Flange, DIN Flange, Tri-Clamp, Female NPT, Straight Pipe Thread DIN ISO 228/1 G, SMS Thread, Sanitary Thread (DIN 11851).
Line Size	1/4" to 12" (DN 6 to DN 300)
Wavelength Range	250-2500 nm (UV/VIS/NIR)
Optical Path Length	1 –1000 mm, depending on Line Size
Window Material	Sapphire
Optical Air Purge	Standard, avoids condensation on optics
Elastomers	Viton®, EPDM, Kalrez®, NBR, Fluoraz 797®, Silicone, and others
Operating Temperature	240°C
Operating Pressure	10 mbar – 500 bar



ORDERING INFORMATION	
FOPFC	Fiber Optic Process Flow Cell with SMA connectors, specify materials, Process Connections and Line-Size / Path Length

Custom made modifications are possible, please contact us for more details.

In-Line Flow cells

The in-line flow cells have been developed for in-line absorption measurements.
The flow cells can be delivered for different line sizes: 1/4", 1/2" and 1" diameter.
The flow cells consist of Swagelok union cross tube fittings and 2 UV/VIS/NIR collimating lenses.

The optical path is depending on the size of the flowcell; the 1/4" has 5 mm optical path and the 1/2" has 10 mm optical path and the 1" flow cell has 20 mm optical path. The flow cells have SMA905 connectors for easy coupling to our comprehensive line of fiber optic cables and bundles.

Flowcell-1/4" and 1/2"

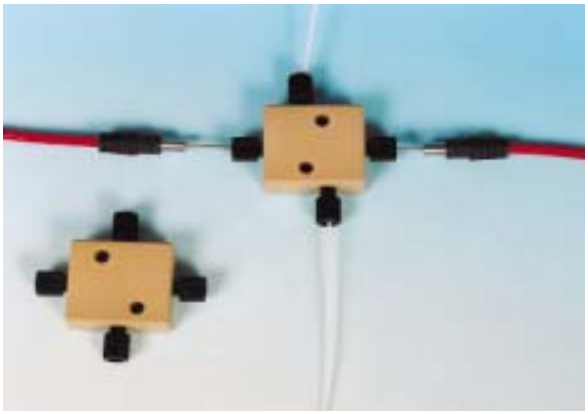
Technical Data

	1/4" flow cell	1/2" flow cell	1" flow cell
Optical path	5 mm	10 mm	20 mm
Wavelength range	200-2000nm		
Fiber connection	2 x SMA905 connectors		
Collimating optics	Plano Convex, focal length 8,7 mm		
Max. Temperature	80°C (HT version till 200°C available on request)		
Max. Pressure	10 bar		
Material	Stainless steel for the fitting, black anodized aluminum for the SMA905 connectors		
Overall dimensions	55 x 45 x 15 mm	72 x 50 x 22 mm	98 x 60 x 38 mm

ORDERING INFORMATION	
FLOWCELL-1/4"	Flow cell 1/4" with SMA adapter, 5 mm path length, incl. 2 UV/VIS/NIR lenses
FLOWCELL-1/2"	Flow cell 1/2" with SMA adapter, 10 mm path length, incl. 2 UV/VIS/NIR lenses
FLOWCELL-1"	Flow cell 1" with SMA adapter, 20 mm path length, incl. 2 UV/VIS/NIR lenses

Micro Flow Cell

Micro flow Z-cell



The micro flow cells are Z-cells that can be easily coupled to 1,5 mm PTFE tubing with 0,5 mm inner diameter for in-line absorption measurements and HPLC applications. For the micro HPLC cell a temperature control is possible using a Peltier element controlled by a computer and connected via the RS-232 interface. The Z-flow cells can be coupled with 2 special fiber optic cables (see below). The Micro HPLC connects directly to SMA adapters.

Micro HPLC flow cell with temperature control

Technical Data

Flow Cell Type	Micro flow Z-cell	Micro HPLC cell
Wavelength Range	200-2200 nm	250-2500 nm
Optical path length	1.5 mm / 10 mm	5 mm / 10 mm
Sample volume	3 µl / 18 µl	1 µl / 2 µl
Tubing OD connection	1.5 mm (1/16")	1.5 mm (1/16")
Pressure rating	10 bar	30 bar
Fiber optic coupling	1.6 mm ferrule	SMA connector
Temperature regulation	-	10-40 °C ± 0,1 °C
Dimensions / material	32 x 38 x 13 mm / PEEK	40 x 70 x 46 mm / Aluminum

ORDERING INFORMATION	
FLOW-CELL-Z-10	Flow Z cell with 10 mm optical path
FLOW-CELL-1.5	Flow cell with 1.5 mm optical path
FC-UV400-1-FIA-SR	Fiber cable 400 µm, UV/VIS, sol. Resistant for Flow Z cell 10/1.5
Micro-HPLC CELL-X	Flow Z cell with X mm optical path (X = 5 or 10 mm)
MICRO-HPLC CELL-X-TC	Flow Z cell with X mm optical path and TE control (X = 5 or 10 mm)

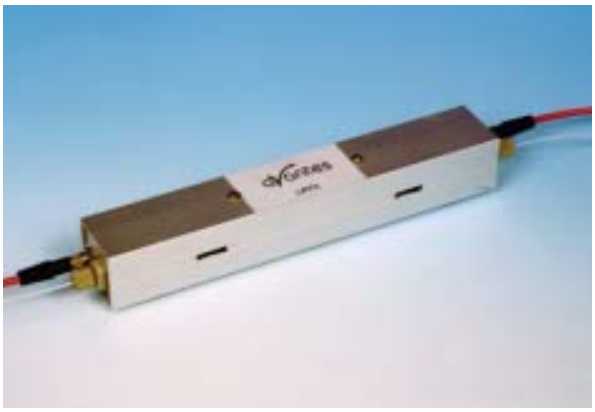
Long Path Flow Cells

The LFC was developed to measure low-concentration aqueous samples. LFC series flow cells are available in 50 mm, 100 mm, 500 mm, 1 m and 2 meter path lengths for absorption measurements. All LPC flow cells are useful for measuring low-volume, low-concentration (ppb-ppt) aqueous samples, and can be used for discrete or continuous flow cell sampling.

The LPC Long Pass Flow Cells consist of 550-micron inner-diameter fused silica tubing with a low refractive index polymer and with an internal volume of 240 µl/meter. The tubing has chromatography tube fittings for liquid flow. All LPC Flow Cells couple easily via SMA terminations.

LPC´s can be used in a wide variety of applications, such as liquid chromatography detection, drinking water analyses, as well as environmental and oceanographic monitoring systems.

LPC-FS-50 50 mm path length



Technical Data

Waveguide material	Fused silica tubing coated with low refractive index polymer
Optical Pathlength	50 mm, 100 mm, 500 mm, 1 m, 2 m
Inner Diameter	550 µm
Internal Volume	13-240 µl
Fiber input	400 µm
Max. Temperature	160 °C
Pressure Range	1.5 - 2000 PSI

ORDERING INFORMATION	
LPC-FS-50	Long path flow cell fused silica tubing, 50 mm optical pathlength
LPC-FS-100	Long path flow cell fused silica tubing, 100 mm optical pathlength
LPC-FS-500	Long path flow cell fused silica tubing, 500 mm optical pathlength
LPC-FS-1000	Long path flow cell fused silica tubing, 1 m optical pathlength
LPC-FS-2000	Long path flow cell fused silica tubing, 2 m optical pathlength

White Reference Tile

The WS-2 white reference tile is made out of a white diffuse PTFE based material, meeting the highest demands with regard to high grade diffuse reflectance. The WS-2 is mostly used in colorimetric applications where a reference signal has to be obtained during a reflection measurement. Thanks to most accurate preparation of the PTFE and its processing to an amorphous structure, the tile reflects light from 350-1800 nm with ca 98% and from 250-2500 nm more than 92%. The material offers long term stability, even in UV applications. The plastic is hydrophobic and chemically inert.

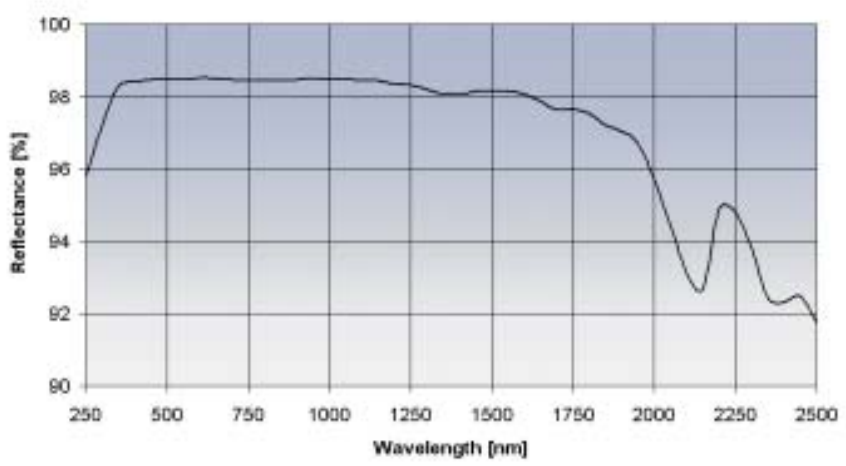
Specially for gemology applications the WS-2 is used in combination with a reflection integrating sphere. The gemstone is then put on the middle of the tile, the integrating sphere over it. A special WS-2 tile (WS-2-GEM) was developed to be able to cool the gemstones with liquid nitrate, therefore a hole was designed in the middle of the tile (see application section page 113).

The material can be delivered as custom designed items, contact us for more information.

Technical Data

Reflectance (See curve)	98% (350-1800 nm) 92% (250-2500 nm)
Max. temperature	280°C
Dimensions tile	32 mm diameter / 10 mm thick
Housing	38 mm diameter, black anodized

Spectral Reflectance



ORDERING INFORMATION	
WS-2	White reference tile
WS-2-GEM	White reference tile with hole, specially for Gemstone measurement