



Variable and fixed path transmission cells for demanding applications...UV through Near-IR.

FFV Series transmission cells are designed to provide uncompromising performance for a wide variety of process development and on-line applications. They combine high optical transmission with an unimpeded flow path and a wide range of available pathlengths -- which can be set to a desired value with a high degree of accuracy. These capabilities are made possible by the use of a pair of precisely engineered optical plungers which face each other across the flow path. These are mounted on a choice of four different cell bodies, providing features such as pathlengths ranging from 0.5 mm to 20 cm, flow diameters to 25 mm, temperature control capability, a clean-out port, and a ninety degree scattered light port. Each of the models is available in versions optimized for near-IR, visible, or UV operation.

Choice of Variable or Factory Calibrated Pathlength

The pathlength of each FFV series cell is determined by the dimensions of its cell body and by the depth of penetration of its two plungers. The latter is controlled by a pair of knurled adjustment collars having a pitch of 1 mm per rotation. Each collar allows approximately 8 mm of penetration range. Cells having the suffix "VP" are provided with fully adjustable collars, allowing the user to set the pathlength. Once set, the position of each collar can be locked by tightening four clamping screws. The pathlength can be made "permanent" by applying locking adhesive to the collar threads.

FFV Series cells can also be obtained with pre-calibrated and locked pathlengths. In this case the model number suffix is XX where XX designates the pathlength in mm increments. Each plunger is individually calibrated on a

standard test fixture. This, combined with precise machining of the cell bodies, makes it possible to interchange plungers and bodies with minimal effect on pathlength.

FFV-310 Basic Cell

Model FFV-310 provides the fundamental FFV features in a basic, no frills, package. It provides a straight-through 12.5 mm diameter flow path and a range of pathlengths from 0.5 to 15 mm. It is available in either the variable path or pre-calibrated, fixed path versions.

FFV-315 Long Path Cell

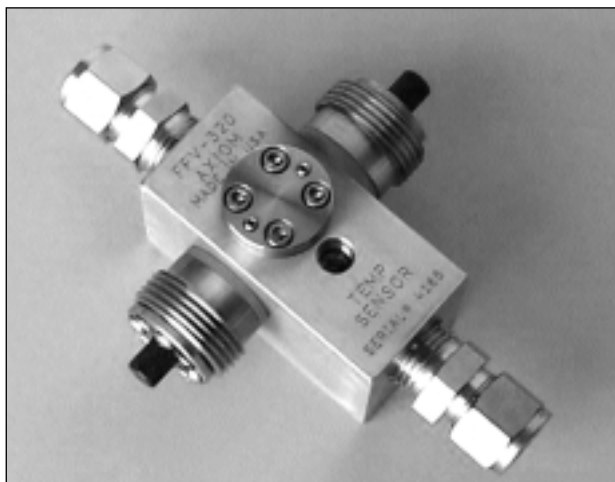
This model uses the same plunger design as the FFV-310 but with a cell body which provides for standard pathlengths of 25, 50, 100, or 200 mm. The adjustment collar allows the pathlength to be varied around these lengths for fine pathlength calibration. The flow path of the FFV-315 enters and exits at right angles to the optical path.

FFV-320 Full Capability Cell

The FFV-320 features the same flow characteristics and pathlength selection as the FFV-310 but adds several features, including a channel for either a cartridge heater or fluid temperature control, standard Kalrez® O-ring seals, and a clean-out port at right angles to both optical and flow paths. This port also serves as a fitting to mount an optional optical module for monitoring scattered light at 90° to the optical path. (See model FVT-301, over.)

FFV SERIES

FIBER-OPTIC COUPLED TRANSMISSION CELLS



FFV-330 Large Flow Path Cell

This model is similar to the FFV-320 but features a 25 mm diameter flow path and optical pathlengths ranging from 15 to 30 mm.

Features:

- Robust construction
- High transmission
- Unrestricted flow path
- Variable or factory-set pathlength
- Pathlengths from 0.5 mm to 20 cm
- Near-IR, Visible, or UV spectral range
- Choice of SMA or FC connectors

FVT-301 Scattering Module

Models FFV-320 and 330 can easily be adapted to the measurement of turbidity, fluorescence, or even Raman scattering by adding the FVT-301 module. This module adapts directly to the clean-out port of either cell model. It includes a fiber connector/collimator unit and an objective lens positioned to collect scattered radiation at 90° from the center of the straight-through optical path.

FCH Series Conduit Termination Housings

Model FCH-21 encloses the fiber optic connectors while providing a purge

output fitting and a 3/4 NPT female fitting for proper termination of a protective conduit. Model FCH-23 adds an integral fin structure for improved heat sinking.

FOI-5XY Fiber-Optic Sample Compartment Interface

For use with FT-NIR spectrometers and other spectrometers with internal sample compartments. Includes pick-off and return optics, purge shrouds, SMA connectors, and mounting plate to match user specified spectrometer. "XY" designates spectrometer make and model. "R" designates spectral range. Inquire with Axiom for specifics.

Available Options

Specifications for standard model FFV cells are given in the accompanying table. In addition to these, a number of options are available. These include materials of construction such as Hastelloy C-276, optional flow fittings such as Swagelok "O" Series, non-standard pathlengths, and higher temperature operation. Inquire with Axiom for specifics.

FFV Transmission Cell Specifications

	<u>FFV-310</u>	<u>FFV-320</u>	<u>FFV-330</u>	<u>FFV-315</u>
Seal Type:	Viton®	Kalrez®	Kalrez®	Viton®
Standard Pathlengths:	0.5 to 15 mm	0.5 to 15 mm	15 to 30 mm	25 to 200 mm ⁽¹⁾
Window Material ⁽²⁾ :	Sapphire	Sapphire	Sapphire	Sapphire
Wetted Metal:	316 Stainless steel	316 Stainless steel	316 Stainless steel	316 Stainless steel
Optical Transmission:	>40%	>40%	>40%	(See note ⁽³⁾)
Maximum Temperature ⁽⁴⁾ :	150°C	180°C	180°C	150°C
Maximum Pressure:	500 psig	500 psig	500 psig	500 psig
Flow Path Diameter:	12.5 mm	12.5 mm	25 mm	12.5 mm
Temperature Control ⁽⁵⁾ :	No	Yes	Yes	No
Clean-out Port:	No	Yes	Yes	No
Scattering Port (at 90°):	No	Optional	Optional	No

Notes:

- ⁽¹⁾ Other pathlengths are available.
- ⁽²⁾ Window material for the UV range is Suprasil (UV grade fused silica).
- ⁽³⁾ Transmission is pathlength dependent.
- ⁽⁴⁾ Higher temperature options are available. Operation above 100°C requires the use of suitable fiber cables and/or FCH Series conduit termination housing.
- ⁽⁵⁾ Provision for temperature control consists of one channel for fluid or cartridge heating and a fitting for an RTD or thermocouple temperature sensor.

Model Designations: FFV-310R-X FFV-320R-X FFV-330R-X FFV-315R-X

Spectral Range: Specify R = N (800-4500 nm), R = V (350-2000 nm), or R = U (200-800 nm, optimized for 230-250 nm)

Optical Pathlengths (fixed path models):

FFV-310/320: X = 0.5, 1, 2, 5, 10, or 15 mm FFV-330: X = 15, 20, 25, or 30 mm FFV-315: X = 25, 50, 100 or 200 mm

Variable Pathlengths: Specify X = VP. See available ranges, above.

Axiom Analytical, Inc. • 17751 Sky Park Circle #ABC • Irvine, CA 92614
Tel: (949) 757-9300 • Fax: (949) 757-9306
Web: www.goaxiom.com • Email: info@goaxiom.com