



# Quick Reference Guide Near-Infrared & UV-Visible Products

## LIQUID TRANSMISSION

### FPT-850 Process Transmission Probes



Unmatched robustness and photometric accuracy - provided by Hellma Analytics welded metal seals and internal gold lightguides with Axiom Technology.

- Welded metal seals for extreme robustness and chemical resistance
- Withstands temperature cycling and thermal shock
- Pressure ratings to 300 bar temperature ratings to 400°C
- Pathlengths from 1mm to > 20cm
- Standard secondary containment barrier
- NIR standard, UV and Visible optional

### FC Series Configurable Transmission Cells



The FC Series employs standardized optical probes which can be combined with off-the-shelf Swagelok components to configure cells having wide ranging pathlengths and flow configurations.

- Welded metal seals for extreme robustness and chemical resistance
- Secondary containment barrier
- Minimum possible flow restriction
- Configurable pathlengths from 2 mm to over 2 meters using standard Swagelok components

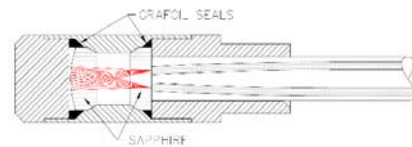
### FPD-830 Laboratory Transmission Probes



Ideal for laboratory chemical analysis and process development. Calibrations developed using the FPD-830 can be scaled up for on-line deployment using FPT-850 process probes.

- Welded metal seals for extreme robustness and chemical resistance
- Standard coverage: 400nm – 2200nm
- Internal fibers enable reduced diameter for small scale reaction monitoring
- Rated for temperatures up to 150°C and pressures to 50 bar

### FPX Transflectance Probes



Imaging optical design eliminates stray light due to sample backscatter and window reflectance. Small diameter is made possible by the double pass transflectance configuration.

- Welded metal seals for extreme environments
- 6.35mm diameter for small scale reaction monitoring
- Less than 1% stray light
- Rated for temperatures up to 240°C and pressures up to 100 bar
- NIR or UV-Visible spectral response

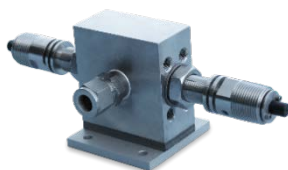
## FFV Liquid Flow Cells



Combining high optical transmission with an unimpeded flow path and a wide range of available pathlengths - either factory set or user adjustable.

- Variable or factory-set pathlengths from 0.5 to 12 mm
- Robust stainless steel/sapphire/Kalrez® 6375 construction
- Temperature control and thermocouple ports
- Cleanout port
- NIR or UV-Visible configurations

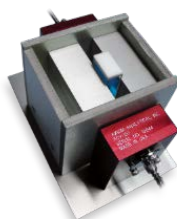
## FET-980 Cells for Extreme Conditions



Fiber-optic coupled flow cells for spectroscopic analysis of polymer melts and other demanding process applications.

- Welded metal seals
- Temperature to 400°C
- Pressures to 400 bar
- Customized flow fixtures available

## FCV-150 Heatable Cuvette Sampler



A fiber-optic coupled sampling system for the visible through near-IR analysis of liquid samples contained in standard cuvettes.

- Accommodates cuvettes with pathlengths from 1 to 50 mm
- Preheating region for additional cuvettes
- NIR or UV Vis configurable
- Rated for temperatures up to 200°C

## GAS TRANSMISSION

### FFT Series Low Volume Gas Cells



FFT Series fiber optically coupled Gas Cells utilize small diameter gold-coated lightguides, enabling extremely low volume and rapid sample exchange. The precise overlap of the gas flow and optical paths insures a very high degree of stability and photometric accuracy.

- Low Volume
- Negligible sample carryover
- Pathlengths of 0.5, 1 and 2 meters
- Easy maintenance/cleaning
- Fiber optic coupling to any NIR spectrometer

### FFM Multipass Gas Cells

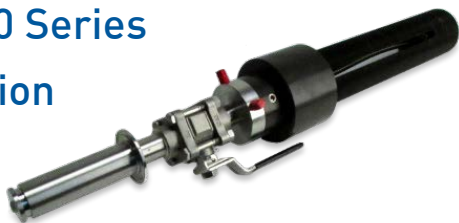


FFM Series cells meet the rigorous requirements of process gas analysis. These cells can be disassembled, cleaned, and reassembled with minimal realignment. They are uniquely suited for use with tunable laser spectrometers.

- Negligible sample carryover
- Fixed, and stable pathlength
- Easy maintenance
- Designed for ambient off-gas monitoring

## DIFFUSE REFLECTANCE

### FDR-700 Series Immersion Probes



For the contact analysis of optically scattering materials such as pharmaceutical powders, polymers, and food products. These probes provide high collection efficiency, low stray light, robust construction, and excellent chemical resistance.

- Stray light < 1%
- Retractable version available (model FDR-798)
- Rated for temperatures up to 250°C and for pressures up to 200 bar
- Compatible with most Near-IR and UV-Visible spectrometers
- Available with long fiber-optic cables for remote operation
- 78 x 200  $\mu\text{m}$  interlaced fibers

### FDR-800 Non-Contact Diffuse Reflectance Probes



FDR-800 Series Probes provide optimum performance in the non-contact analysis of powders and other diffusely reflecting materials. They feature, large depths of field, adjustable sample offset distance, and low stray light. Specialized models are available for viewing a process through a thick window (FDR-810) and for in-situ self-cleaning (FDR-825).

- Adjustable target offsets from 7 to 120 mm
- Adjustable spot size
- Stray light < 1%, even when viewing a sample stream through a thick window (model FDR-810)
- Vortex spray self-cleaning capability (model FDR-825)
- 78 x 200  $\mu\text{m}$  interlaced fibers

## UV-VISIBLE ATR

### FNL UV-Visible ATR Tunnel Cells

Hellma Analytics FNL Series ATR cells with Axiom Technology provide a high degree of flexibility by allowing a choice of ATR element materials and geometries so as to set the effective pathlength and hence absorbance sensitivity. This allows the characteristics of the cell to be optimized for a given application.

- Convenient analysis of chromophores and other strong absorbers
- Fiber-optic coupling to most UV-Visible spectrometers
- Response down to 200 nm
- Number of reflections and penetration depth set by interchangeable ATR elements
- Choice of fused silica or sapphire elements



# FIBER OPTIC MULTIPLEXERS AND INTERFACES

## FMX Fiber Optic Multiplexers



FMX Series multiplexers allow a single spectroscopic instrument to be switched between multiple sampling devices. Their proprietary design eliminates spectral artifacts, allowing calibration transfer between channels.

- Electronic switching between up to 16 channels
- Switches both transmitted and received signals
- Excellent channel matching
- Absence of frequency shift between channels
- Controlled using common data processing protocols
- Near-IR, Visible, and UV versions

## FOI and FAC Fiber Optic Interfaces

Sample region and collimated beam interfaces for spectrometers not already equipped for use with optical fibers.

### FOI Sample Region Fiber Optic Interface

- Provides fiber–optic coupling for transmitted and received signals
- Compatible with most spectrometers
- Individual models available for Near-IR, Visible, and UV ranges

### FAC Collimated Beam to Fiber Optic Interface

- Couples to collimated beam ports on many spectrometers
- Compatible with Axiot optical transfer system
- Reflective optics for broad spectral coverage