

FDR-800 Series Non-Contact Diffuse Reflectance Probes

Fiber-optic coupled Near-IR probes for use in product and process development and on-line process analysis.

FDR-800 Series diffuse reflectance probes have been designed to provide optimum performance in the non-contact analysis of powders and other diffusely reflecting materials. The series includes three models.



FDR-803, 805, and 810 Diffuse reflectance probes

MODEL FDR-803

This model is optimized for substantial sample offsets (60 – 120 mm). This, combined with its reduced diameter and stainless steel construction, make it ideal for the analysis of materials in reaction vessels such as glass vessels with 24-40 tapered joints. A proprietary optical design effectively minimizes stray light due to reflection from the probe's optics. The probe's integral bifurcated 80 fiber bundle provides an ideal combination of sensitivity and economy.

MODEL FDR-805

The FDR-805 employs the same optical design as the FDR-803. However, its larger diameter enables it to be optimized for use with reduced sample distances. This, in turn, results in a reduced illuminated spot diameter and increased sensitivity.

MODEL FDR-810

This model is optimized for viewing a sample through thick windows such as those found on pharmaceutical dryers and blenders.

The key is the use of a coaxial array of optical fibers in conjunction with a single lens to overlap the illuminating and receiving fields of view at a desired distance in front of the probe. By effectively minimizing optical divergence, this design eliminates stray light, resulting in excellent photometric accuracy.

MODEL FDR-825

Employing the same optical design as FDR-805, The FDR-825 is designed for insertion into a process vessel. It includes a self-cleaning feature employing a set of orifices around the objective optic to enable flushing by means of a vortex flow of solvent or vapor.

The four probes in the FDR-800 Series can be optimized for use with diverse spectrometers and sampling requirements. For more information, or to discuss your specific application, please do not hesitate to contact us at (949)757-9300 or visit us on the web at

www.hellma-axiom.com

FEATURES:

FDR-803:

- Optimized for reduced diameter
- Sample offsets from 60 to 120 mm
- 316 stainless steel body

FDR-805:

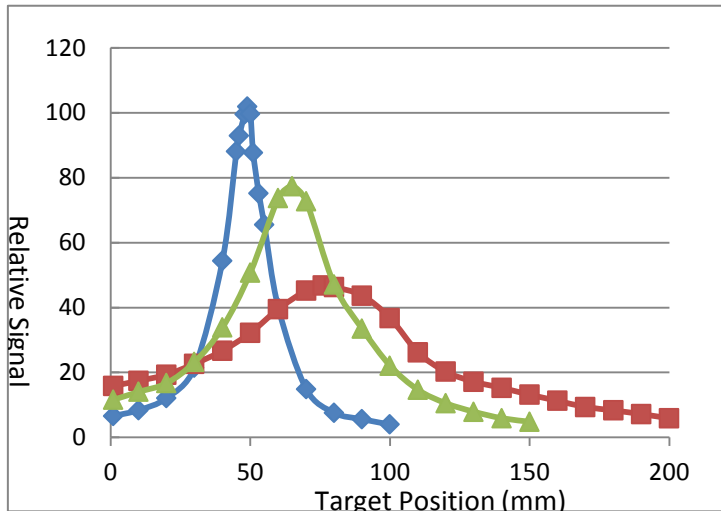
- Optimized for sensitivity and flexibility
- Sample offsets from 25 to 100 mm
- Low stray light

FDR-810:

- Immune to window reflection
- Large viewed spot diameter
- Suitable for remote sensing

FDR-825:

- Suitable for process insertion
- Self-cleaning provision via vortex flow



Signal level vs. sample position for three different adjustments of an FDR-803 probe, illustrating the large sample offsets and depth of field available with the FDR Series.

FDR-825 Self-cleaning diffuse reflectance probe.

SPECIFICATIONS

Model Designations:	FDR-803	FDR-805	FDR-810	FDR-825
Spectral Response:	400-2200 nm	400-2200 nm	400-2200 nm	400-2200 nm
Optimum Sample Offset:	40 – 120 mm	25 – 100 mm	7 - 15 mm	25 – 100 mm
Illuminated Spot Diameter:	10 mm @ 100 mm offset	5 mm @ 50 mm offset	8 mm @ 12 mm offset	5 mm @ 50 mm offset
Probe Diameter:	19 mm	31.8 mm	28.6 mm	50.8 mm
Length:	300 mm (200 mm max insertion length)	180 mm (nominal*)	160 mm	533 mm (430 mm max insertion length)
Inserted Material of Construction:	316 stainless steel	NA (External Mounting)	NA (External Mounting)	316 stainless steel
Lens/Window Material:	SF 5 glass	SF 5 glass	SF 5 glass	BK 7 glass
Lens/Window Seal	High temperature epoxy	High temperature epoxy	High temperature epoxy	Kalrez® O-ring
Illumination Fiber-Optic Cable:	40 fiber bundle, 1.7 mm diam. active area	40 fiber bundle, 1.7 mm diam. active area	7 fiber bundle, 2 mm diam. active area	40 fiber bundle, 1.7 mm diam. active area
Receiving Fiber-Optic Cable:	40 fiber bundle, 1.7 mm diam. active area	40 fiber bundle, 1.7 mm diam. active area	Single fiber, 0.6 mm core diam.	40 fiber bundle, 1.7 mm diam. active area

* Length depends on adjustment.