

T300-RT-UV-VIS Transmission Dip Probe

The T300-RT-UV-VIS Transmission Dip Probe couples to our spectrometers and light sources to create small-footprint optical-sensing systems for measuring in situ transmission in chemical solutions and other liquids. The standard T300-RT-UV/VIS Transmission Dip Probe has (2) 300 mm diameter solarization-resistant fibers (1 illumination, 1 read), in a 5.0" x 0.25" OD stainless steel ferrule. Screw-on, interchangeable probe tips, in path lengths of 2 mm, 5 mm, or 10 mm, are available to configure your system for either optically dense or dilute solutions.



Caution:

- Handle the probe with care. Dropping the probe may cause permanent damage.
- Bubbles in the sample will interfere with your readings. Regularly inspect the sample region for bubbles.

Overview

The T300 consists of two identical fibers in a bifurcated assembly. A plano-convex lens shapes the light coming out of the illumination fiber. The light is transmitted through the sample, reflected off the mirror, interacts with the sample again, and transmitted back through the probe via the read fiber. Because the light travels through the sampling region twice, the optical path length is actually twice the length of the sample aperture. The transmission cell is used to measure absorbance of the fluid that fills the sample compartment between the fibers and the mirror, which is a UV-enhanced aluminum, second-surface mirror.

Operation

1. Connect one leg of the probe to the light source, and then connect the other leg to the spectrometer. It does not matter which leg of the probe you connect to the light source or spectrometer.
2. Screw the appropriate probe tip for the experiment onto the end of the probe.

Note: To replace the probe tip, unscrew the probe tip and screw in the 2 mm, 4 mm, or 10 mm replaceable tip.

3. Prepare the sample.
4. Place the probe tip in the sample and adjust the integration time in OOIBase32 to obtain a signal of ~3500 counts while in scope mode.
5. Minimize the light reflecting from the backside of the sleeve lens by optimizing the back-reflection of the probe. Optimize the back-reflection of the probe as follows:
 - a. Remove the tip from the probe.
 - b. Immerse the probe in a large container of water with a dark background (such as a black plastic bucket or a beaker enclosed in a dark cloth). When the light source is on and the probe is in this state, only light from the back surface of the lens in the probe sleeve should be reflected back into the detection fiber. The spectrum displayed in OOIBase32 should be relatively smooth, and will increase or decrease in intensity as you move the probe in and out of the sleeve.

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- c. Adjust the probe position in the sleeve until the signal intensity is minimized, then lock the probe in place with the setscrews.

The spectrum you see at this point should be similar in intensity to the dark spectrum.

- d. Reattach the probe tip and verify that signal intensity has not appreciably increased.

Notes: The inner barrel is set at the time of manufacture for a 10 mm tip in aqueous media. If your application requires measuring gases, you will have to adjust the inner barrel.

6. Immerse the probe in distilled water (or the solvent of your choice) and take a reference spectrum.
7. Remove the probe from the reference, block the light path going to the spectrometer, and take a dark spectrum.
8. Ensure that the light path is clear, then place the probe in the sample solution and take a sample spectrum.

T300-RT-UV-VIS Specifications

Fiber core diameter:	300 μ m
Fiber material:	Silica (core and cladding) Poyimide 300um SR (buffer) PVC zip tubing (jacketing)
Fiber bundle:	1 illumination fiber and 1 read fiber (solarization resistant)
Fiber bundle length:	2 meters (breakout is 1.5 meters from probe tip)
Wavelength optimization:	200-1100nm
Numerical aperture:	0.22
Inner and outer ferrules:	Stainless steel
Ferrule diameters:	0.125" (inner ferrule diameter), 0.25" (outer ferrule diameter)
Outer ferrule length:	5.0"
Terminations for illumination and read legs:	SMA 905
Path lengths:	2mm, 4mm, and 10mm stainless steel removable tips
Temperature tolerance of epoxy:	300 °C for standard probes